APPENDIX A: TECHNICAL MEMORANDA

GeoResources, LLC

Ph 253-896-1011
Fx 253-896-2633

5007 Pacific Hwy. E., Suite 16
Fife, Washington 98424-2649

May 2, 2014

Ueland Tree Farm
9401 North Harborview Drive
Gig Harbor, WA 98332

Attention: Mr. Mark Mauren

Geologic and Hydrogeologic Report
Supplement
UTF - Werner Road Connector
Ueland Tree Farm Mineral Resources
Development
Kitsap County, Washington
Job: Ueland TreeFm.Supplement.RGS

INTRODUCTION

This report supplements the previous geologic and hydrogeologic portions of the Ueland Tree Farm, LLC (UTF) Mineral Resource Development reports prepared in 2006 by GeoResources, LLC and in 2009 by Parametrix, respectively. This supplement is based on amended project and site descriptions, as discussed below. Other reports, specific to the various elements of the original Mineral Resource Development documents, are available at the UTF website (Uelandtreefarm.com).

The approved "Ueland Tree Farm Mineral Resource Development Project" proposes development of commercial aggregate resources sites (both sand and gravel, and rock) on the UTF site. Under the approved development, approximately 110 acres will be developed for surface mining over about a 50-year period. This includes Gravel Mine "A" and Quarries "A", "B", and "C",

This supplement summarizes the geologic and hydrogeologic conditions in the proposed modified site area, referred to herein as the "connector". Specifically:

- Shifting of the transport route of rock and aggregate products from Northlake Way to Werner Road via a new road that extend between the Ueland Tree Farm site and Kitsap Quarry, and from there to Werner Road, the connector road.
- Moving the aggregate processing facilities from the Ueland Tree Farm site to an off-site processing facility (Kitsap Quarry); UTF therefore requests that the CUP Conditions that apply to the processing facilities at Gravel "A" be removed from the CUP.

Specifically, this supplement summarizes the geologic and hydrogeologic conditions related to the proposed UTF - Werner Road Connector to be constructed from the

southeast portion of the UTF site through the Kitsap Quarry to Werner Road. The approximate location of the Supplement Area is illustrated on the Site Vicinity Map, Figure 1. The geology and hydrogeology of the UTF and Kitsap Quarry site areas, including the east portion of the Werner Road connection, were previously provided in site specific reports. The proposed connector road alignment is illustrated on the Site Map, Figure 2.

SITE CONDITIONS

Connector Road Area - Surface Conditions

The connector road between UTF and Werner Road extends east from an established timber road situated in the east portion of the UTF site as illustrated on the Site Plan. The new connector will extend east from the existing road, traversing a steep slope area that extends down to a moderate sloping area adjacent to the railroad tracks, and then a to gently sloping to flat area in the valley floor. The road connector crosses the flatter valley floor area through the Kitsap Quarry, and then traverses a steep slope area northeast of the quarry connecting to Werner Road.

The ground surface in the west steep slope area ranges from approximately 20 to 120 percent. This area is well vegetated with second growth timber with a dense understory. Based on our site observations and shallow hand excavations along the proposed road alignment, the shallow soils consist of intermittent sand with variable silt, gravel and cobbles, and weathered basalt bedrock. We expect that bedrock will be encountered over most of this section of the new road alignment, and that it will become more competent with depth. There may be localized areas where larger equipment (hoe-ram) may be required to excavate and remove the weathered bedrock to achieve the finished subgrades.

At the lower elevations, the valley floor area, where the road will traverse the Kitsap Quarry site, the soils generally consist of silty sand with variable gravel. This area is vegetated with scattered stands of second growth timber with dense understory with brushy/grassy fields. The lower growing vegetation is generally associated with roads, railroad access and power-line easements.

The east portion of the connector road will traverse a second steep slope area situated in the northeast portion of the Kitsap Quarry and connect to Werner Road as illustrated on the Site Plan. The east steep slope area ranges from 15 to 100 percent. The area is well vegetated with second growth timber and a dense understory.

The USDA Natural Resource Conservation Service (NRCS) Web Soil Survey for Kitsap County maps the soils in this area as Belfast loam (5), Norma fine sandy loam (37), Neilton gravelly loamy sand (36), Dystric Xerothrents (10) and Kilchis very gravelly sandy loam (26). A copy of the SCS map for the site vicinity is attached as Figure 3.

Based on our geologic reconnaissance of the proposed connector road alignment, we have observed no evidence of significant erosion or slope instability. The area is well vegetated and construction activities will be limited to the construction area.

Geologic Hazards

The Kitsap County Critical Area Ordinance (CAO) defines geologic hazardous areas as areas susceptible to erosion, sliding, earthquakes, or other geologic events such that

they are not suitable for development. Much of the west and east steep slope areas of the proposed connector road slope greater than 30 percent, and therefore meet the technical criteria of a geologic hazardous area; high erosion and landslide hazard risks based on slope inclination. We observed no evidence of significant erosion or slope instability at the times of our site reconnaissance(s), including the existing road areas above which traverse similar steep slope areas. The road alignment area is generally well vegetated and underlain by bedrock material at relatively shallow depth. Although it is possible that erosion and/or slope instability can occur during construction activities in steep slope areas, the erosion areas and/or sloughs are typically small, localized and easily repaired/stabilized as part of the road design/construction. Specific mitigation measures and long term erosion and stabilization measures are discussed below in the "**Mitigation Section**".

Project Area Geology

According to the *Geologic Map of the Wildcat Lake 7.5 Minute Quadrangle, Kitsap and Mason Counties, Washington* by Haeussler and Clark, 2000, the project site is located in an area underlain by a combination of glacial soils and bedrock. A portion of that map for the site area is included as Figure 4. Our interpretation of the stratigraphy in the proposed connector road area is based on the observed soil and rock conditions, and the materials encountered in our subsurface explorations.

The existing topography, as well as the surficial and shallow subsurface soils in the area, are the result of the most recent Vashon Stade of the Fraser Glaciation that occurred between 12,000 to 18,000 years ago, and the weathering, erosion and human activities (mineral resource extraction) that have occurred since that time. The encountered glacial soil types include glacial till, glacial recessional outwash, glacial lake sediments, and colluvium. The Vashon glacial till consists of a heterogeneous mixture of clay, silt, sand, and gravel that was deposited at the base of the prehistoric continental glacial ice mass and was subsequently over-ridden. As such, the glacial till, and the soils below the till, exhibits high strength and low compressibility characteristics. The upper portion of the glacial till has been weathered to a medium dense condition. The recessional outwash deposits that locally overlie the till consists of graded deposits of sand and gravel that were deposited by melt water streams and rivers emanating from the retreating glacial ice mass. The glacial lake sediments generally consist of localized deposits of silt and fine sand. The colluvial soils typically consist of a mixture of the upslope soils that have been weathered and deposited on the lower slope and valley floor areas.

Bedrock soils in the connector road area occur at shallow depths below the intermittent glacial soils, and are locally exposed as outcrops of weathered rock. The primary types of bedrock mapped and observed in the connector road area include massive aerial basalt flows of the Crescent Formation (Tcb) and Submarine basalt flows and volcanoclastic rocks (Tcbs). The bedrock materials in the connector road area are middle Eocene age (46 to 50 million years ago). The younger and overlying massive basalt flows (Tcb) that occur in the area can reach more than 180-meters in thickness while the older submarine complex (Tcbs) typically consists of basalt interbedded with sandstones, siltstones, tuffs, and breccias. According to Haeussler and others, (2000), aeromagnetic and gravity data over the Green and Gold Mountain areas, indicate that highly magnetic and dense rocks are located within a few kilometers of the surface, inferring that a deeper ultramafic rock complex may be present at depth. In the connector road area, the near surface materials were observed to consist of thin intermittent glacial soils over shallow weathered basalts. More detailed descriptions of

the geologic conditions are included in the previous Preliminary Geologic Report (GeoResources, LLC) and the Hydrogeologic Report (Parametrix).

Project Area Hydrogeology

Our interpretation of the hydrogeologic conditions in the site area are based on our review of the available hydrogeologic publications and maps, water well records in the site and surrounding area, and our past experience and subsurface explorations throughout the site and surrounding area. Hydrogeologic conditions for the UTF and Kitsap Quarry areas were previously discussed in the GeoResources and Parametrix reports. This supplement specifically discusses the hydrogeologic conditions in the area of the proposed connector road between the UTF site and Kitsap Quarry.

In general, the regional groundwater aquifer in the proposed connector road area consists of a localized semi-confined aquifer in the valley area, generally between 40 and 60 feet below the ground surface. The groundwater occurs within the advance outwash sands situated in the valley area. The Kitsap quarry mine and proposed new road alignment areas area located above this area.

In the upland areas to the east and west of the valley, the steep slope areas, the groundwater is much deeper and in a confined condition. Groundwater flow in the bedrock areas is limited by the nature of the material. No groundwater seepage was observed in the slope areas or encountered in our hand auger or test pit explorations in this area.

Surface water collects into a series of ponds located in the north center of the site. These ponds are identified as wetland areas. No disturbance of these areas is proposed. Surface water from the road surface will be treated and managed in accordance with the current regulations.

The project site is located within a Critical Aquifer Recharge area identified by Kitsap County. The recharge in this area occurs as surface runoff and shallow subsurface flow in the upper bedrock areas that moves down into the valley area. The water recharges the existing pond/wetland system that occurs north of the proposed road and existing mine area. These perched ponds and wetlands overflow north towards the lake, but this water also move as shallow subsurface flow towards the lake. It is likely that some minor of recharge to the deeper aquifer occurs through the underlying aquitard or restrictive layer that perches the water in the site area. It is also likely that once the water reaches the lake, more significant recharge occurs, thus the designation of the area as a Critical Aquifer Recharge area.

POTENTIAL IMPACTS and MITIGATION

Geologic Hazards

Much of the west and east portions of the proposed connector road alignment are situated in areas of steep slope, greater than 30 percent. As indicated, these areas meet the technical criteria of geologic hazardous areas; high erosion and landslide hazards. The road alignment area are well vegetated and underlain at relatively shallow depth by very dense bedrock materials. These areas were previously timber harvested, with no recorded erosion or slope stability issues. We observed no evidence of significant erosion or slope instability at the times of our multiple site reconnaissance(s).

The greatest risk of erosion and/or slope instability in this area will likely occur during road construction activities in the steeper slope areas, such as the areas along the proposed connector road alignment. These areas of potential erosion or failure are typically small, localized and repaired/stabilized as part of the road design/construction process. These process can be mitigated during construction, and after, through the use of conventional drainage and erosion control measures utilized throughout the Puget Sound area. No evidence of significant erosion or slope instability was observed in the areas of existing road alignment that traverse the Ueland site, many of which cross steep slope areas.

The Puget Sound area is identified as a Seismic Risk Zone 3 in the Seismic Zone Map of the United States contained in the 2012 IBC (International Building Code). Based on the subsurface conditions observed in the majority of the site, specifically the new road alignment/extension areas, we interpret the site conditions to correspond to a seismic Soil Profile type S_C, for Very Dense Soil, as defined by Table 16-J (UBC) and Site Class "C" in accordance with Table 1615.1.1 in the 2012 IBC documents. This is based on the inferred range of SPT (Standard Penetration Test) blow counts relative to progress of the exploration equipment and probing with a ½-inch diameter steel probe rod. The shallow soil conditions were assumed to be representative for the site conditions beyond the depths explored. Based on the subsurface conditions observed in the lower portion of the site, we interpret the native site soil conditions in this area to correspond to a seismic Soil Profile type S_E, for Soft Soil, as defined by Table 16-J (UBC), or as Site Class "E" in the 2003 IBC. In addition, the perched water table in this area increases the potential for seismic induced liquefaction

Erosion Hazard Mitigation Measures

Based on the soils observed in the steep slope areas of the site, the site is underlain by a variable thickness of weathered soil material consisting of silty sand with variable gravel and bedrock. As vegetation is removed from these, and even the flatter areas, the potential for erosion will increase significantly. Although the erosion hazard for the granular and bedrock soils is lower than soils with higher silt content, the erosion risk can still be significant depending on the steepness of the slope.

Erosion mitigation measures can be divided into (1) preventing erosion, (2) managing erosion surfaces, and (3) managing contaminated water. It is typically easier and less expensive to prevent erosion. Temporary and permanent erosion control measures should be installed and maintained during and after construction activities to limit the additional influx of water to exposed areas. Runoff water flow should be managed to the extent possible. Temporary ponds or holding cells may be utilized as a final mitigation. This will protect the storm ponds, creeks and wetland areas - all receiving waters. Mitigation measures to reduce the risk of erosion at the site during and after construction will include the following:

- Limit the removal of vegetation to the active construction area.
- Graded areas should be shaped to avoid concentrations of runoff water onto cut or fill slopes, natural slopes or other erosion-sensitive areas.
- Silt fences should be used where appropriate.
- Erosion control measures should include, but not be limited to surficial coverings such as straw mulch, hog fuel, mattings, geotextile fabrics, crushed rock or

visqueen (if necessary).

- Where feasible, collect and/or direct runoff water; ie. swales with check dams.
- Install soil/gravel/rock or waddle berms to eliminate free flow of water.
- Once grading is complete, final ground cover/protection should be used in exposed or disturbed areas; ground cover/protection may include hydro-seeding, long term mulches, jute matting, excelsior matting, wood chips hog fuel, or crushed rock. Permanent erosion protection should be installed as soon as appropriate.

Landslide Hazard Mitigation Measures

As previously discussed, the site and surrounding area have been previously harvested for timber. Based on our data review, no significant erosion or landslide activity was reported or documented during or following the previous harvest. In addition, no evidence of significant erosion or slope instability was observed in the existing road areas that traverse the site. Although the proposed connector road construction will require significant earthwork to reach the design grades, it will be similar to the existing roads at the site. As with erosion, the increased risk of slope instability will occur during the active construction activity. The risk of slope instability can be mitigated with the following;

- Limit the amount of open grading or cut slopes.
- Minimize the removal of vegetation to the active construction area.
- Where possible, leave the stumps in place to minimize the amount of upslope ground disturbance.
- Minimize disturbance of the undergrowth.
- Construct interceptor berms, dikes and/or shallow drainage swales to intercept surface water flow and route the flow away from the cleared/graded areas to a stabilized and approved point of controlled discharge.
- Install collector drains in significant seepage areas.
- Install a berm with collector drain above the slope to prevent uncontrolled runoff from above (only in areas where slopes towards cut slope).
- No side casting of soil/fill material on lower slope areas.
- Stormwater management should include the use of ground cover, ditches/swales, berms, check dams, as described above in erosion hazard section.
- Site specific recommendations will be provided at the time of construction by geotechnical professionals.
- The contractor should perform daily site review and maintenance of all erosion and sedimentation control measures at the site to ensure their proper working order.

No change in the risk of erosion or slope instability is expected at the site or the adjacent areas if appropriate mitigation measures are utilized. Best Management Practices (BMPs) as described in the 2010 Kitsap County Stormwater Manual for construction sites and continued monitoring during and after construction should protect the site and surrounding areas from unwanted erosion or slope instability.

Seismic Mitigation Measures

Based on the soil conditions encountered within the proposed road alignment, two distinct seismic risk zones occur at the site; the sloping upper bedrock areas, and the valley floor area. It is our opinion that the areas of the site underlain by bedrock have a low risk factor related to seismic activity. The lower portion of the site is underlain by more granular soils and perched water. This area does have a higher risk of seismic induced liquefaction.

Liquefaction is a temporary loss of shear strength in a saturated soil mass subjected to cyclical shaking. Ground shaking of sufficient magnitude and duration must occur to induce liquefaction of the soil. The effects of liquefaction may be manifested by sand boils, lateral spreading, slope failures, or seismically induced aerial settlement. Because of the grades in this portion of the site, it is our opinion that the risk of sand boils, lateral spreading, or aerial settlement is possible. However, this risk can be mitigated through proper road design and construction. Typically, the road subgrade section is thickened or geotextile fabric can be utilized to construct a "bridge" section that is not affected by the potential liquefaction of the underlying or adjacent material.

Hydrogeologic Mitigation Measures

Potential Hydrogeologic impacts at this site are related to construction activities during precipitation events. The resultant surface water runoff results in risk of erosion, slope instability and surface/groundwater turbidity transport. In addition, during construction there is an increased risk of a potential contaminant release from equipment. There have been no reported issues associated with historic mine activity at the Kitsap site. All construction activities will be conducted in accordance with the approved plans and project specifications, “Best Management Practices”, County codes and Washington State regulations. Water quality will be monitored during by certified individuals during and following construction, until the permanent erosion control measures are established. Results of the monitoring will be available to the county, and submitted to WDOE.

Although there will be an increase in the amount of runoff in the road area, that runoff will be directed to stormwater management systems that will ultimately allow a portion of the runoff to infiltrate and the remaining water to continue to recharge the shallow subsurface soils and wetland areas to the north. Because the recharge of the shallow water systems will not be changed significantly, the potential recharge of the deeper aquifer will not be adversely affected. Recharge to the deeper aquifers occurs by infiltration of rainfall through the shallow soils, the overlying aquifers and aquitards, and laterally from up gradient sources. It should be noted that the recharge area for the deeper aquifers in this area, essentially occurs over the entire east and west upland areas. This site comprises less than 0.01 percent of that total recharge area.

Any seasonal perched ground water that exists locally is potentially susceptible to surface contamination, but based on well records in the site area, this near surface water is not used as a potable water supply source in the site area. The site activities will be closely monitored and spill prevention plans and kits will be kept on-site at all times. All site activities will be conducted in accordance with “Best Management Practices”, County codes and Washington State regulations. The deeper aquifers are protected from possible contamination by the filtering effect of the overlying sand and gravel and fine-grained silt and clay deposits, as well as the bedrock, that occur in the site area.

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We appreciate the opportunity to be of continued service to you on this project and trust that this will meet the Department of Natural Resources request for a written narrative of the project.

Yours very truly,
GeoResources, LLC

Dana C. Biggerstaff, PE
Sr. Geotechnical Engineer

Brad P. Biggerstaff, LHG
Principal

BPB:DCB:bpb
Do.ID: UelandTreeFarm.ConnectorRd.GRS
Attachments: Figure 1: Project Vicinity Map
Figure 2: Project Site Map
Figure 3: Project Area NRCS - SCS Soil Map
Figure 4: Project Area Geologic Map

PRELIMINARY DRAINAGE REPORT

FOR

UELAND TREE FARM MINERAL RESOURCE DEVELOPMENT

KITSAP COUNTY, WASHINGTON

MAY 2014

Prepared For:
Mr. Mark Mauren
6323 Pioneer Way East
Puyallup, WA 98371
(253) 307-5900

Prepared By:
Kyle M. Mauren, E.I.T., Design Engineer
Brett M. Allen, P.E., Principal
3309 56th st. NW Ste. 106
Gig Harbor, WA 98335
(253) 857-5454

Project # 13-094

*I hereby state that this Preliminary Drainage Plan for **Ueland Tree Farm Mineral Resource Development** has been prepared by me or under my supervision and meets the standard of care and expertise that is usual and customary in this community of professional engineers. I understand that Kitsap County does not and will not assume liability for the sufficiency, suitability or performance of drainage facilities prepared by Contour Engineering LLC. This analysis is based on data and records either supplied to, or obtained by, Contour Engineering, LLC. These documents are referenced within the text of the analysis. The analysis has been prepared utilizing procedures and practices within the standard accepted practices of the industry.*

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1.0 PROJECT OVERVIEW

Project Description

This report supplements the **Preliminary Drainage Report** completed for the Ueland Tree Farm, LLC (UTF) Mineral Resource Development in 2009 by Parametrix. This supplement is based on amended project and site descriptions, as discussed further in this report. Other reports specific to the Mineral Resource Development and referenced here are available at the UTF website (uelandtreefarm.com).

This supplement:

- Characterizes the existing drainage conditions of the expanded project area and assesses potential stormwater impacts and possible mitigation measures.
- Is limited to the addition of a new site access option as outlined below. This option was not directly addressed in the 2009 assessment.

The UTF site is located in Sections 12, 13, 24, and 25, Township 24N, Range 1W, and Sections 7, 18, and 19, Township 24N, Range 1E (Figure 1-1). Access will be via Werner Road in Section 20, Township 24N, Range 1E. The project area is located in the Chico and Gorst Creek watersheds with the majority of the property in the Dickerson Creek subbasin. For more detailed information on the regional setting, refer to the Ueland Tree Farm Kitsap Lake Property Sub-Basin Assessment (Parametrix 2007a).

The approved Ueland Tree Farm Mineral Resource Development Project proposes development of commercial sand, gravel, and basalt mines on the UTF site. Development plans consist of one gravel mine and three basalt quarry areas (see Appendix A for Figure). Under the proposal, areas totaling approximately 110 acres would be developed for surface mining over a 50-year period, not including connecting access roads.

The proposed sand and gravel mine is designated Gravel Mine "A". The three quarry areas are designated Quarry Areas "A", "B", and "C".

A summarization of the proposed modification to the approved Ueland Tree Farm Mineral Resource Development includes:

- Removal of Gravel Mine "B" from the project: The Mountaineers Foundation holds a conservation easement over the area of Gravel Mine "B" and therefore it can no longer be developed. UTF requests that parcels subject to the easement, and other parcels not directly related to the project, be removed from the proposal.
- Shifting the transport of rock and aggregate from Northlake Way to Werner Road: UTF will maintain access for employees and service and maintenance vehicles by way of Northlake Way and Lebers Lane and/or Werner road. UTF requests that, if the access changes to Werner Road, the conditions in the

CUP that apply to the Northlake Way access requirements be removed from the CUP.

- Moving the aggregate processing facilities off-site: UTF requests that, if the facilities are moved off-site, the conditions in the CUP that apply to the processing facilities at Gravel "A" be removed from the CUP.

Project Methodology

The majority of the proposed alternative route uses existing haul roads throughout the Ueland Tree Farm (UTF), Bremerton West Ridge (BWR) and Kitsap Quarry (KQ) site. The existing haul roads are not expected to be expanded and therefore have not been included within this stormwater assessment. The scope of the assessment has been limited to the new roadway construction from the southeastern portion of BWR to KQ. The new roadway will be approximately 15-feet wide and 4,850 feet in length. Creation of this new roadway results in approximately 72,750 square feet (1.67 acres) of new and/or replaced impervious surface. Stormwater runoff associated with the proposed roadway will be mitigated and treated through either a combination detention water quality facility or Low Impact Development (LID) best management practices (BMP) where feasible. All upstream basins will be bypassed through roadway culverts to maintain the existing drainage patterns of the site.

The proposed alternative route travels through both Kitsap County and the City of Bremerton jurisdiction; however, the primary mining operation and new roadway construction is proposed to occur in Kitsap County jurisdiction. Therefore, the 2010 Kitsap County Stormwater Design Manual (SDM) will provide the methodology and requirements to address and mitigate potential impacts to stormwater for the project.

Low Impact Development (LID) stormwater facilities are proposed along the roadway in the vicinity of wetland and fish and wildlife habitat and associated protective buffers in order to enhance and minimize potential intrusions. LID facilities will be designed in accordance with the SDM and 2009 Kitsap County Low Impact Guidance Manual.

The proposed alternative route crosses an identified fish-bearing stream at two existing crossings. The existing 18" diameter culverts located at these existing crossings will be upgraded with guidance from the 2013 Washington Department of Fish and Wildlife (WDFW) Water Crossing Design Guidelines. The replacement of these culverts will require a Hydraulic Project Approval (HPA) from the WDFW.

2.0 PREDEVELOPED SITE CONDITIONS

The new roadway alignment traverses from existing haul roads situated on the hillside of the UTF property down to the valley floor. The road crosses primarily undeveloped forest land and bisects a Navy Railroad, natural gas corridor, power corridor and associated gravel access roadways.

Topography

The valley hillside features slopes in excess of 30%. The typical slope in this portion of the alignment is roughly 50%. Further to the north and south of the proposed alignment the grades along the hillside increase to greater than 90%. Once on the valley floor, the topography becomes more rolling in nature with grades typically within 2-15%. For further discussion on the topography of the site please see Appendix E for the Geotechnical and Hydrogeologic Report Supplement prepared by GeoResources LLC.

Soils

The Natural Resources Conservation Service (NRCS) soil survey identifies a number of different soil groups along the proposed roadway alignment, Including: Kilchis very gravelly sandy loam (25, 26), Ragnar fine sandy loam (46), Norma fine sandy loam (37) and Nielton gravelly loamy sand (36).

Kilchis very gravelly sandy loam, 15 to 70 percent slopes (25, 26) is situated on the valley hillside. The Kilchis soil group has a hydrologic soil group (HSG) rating of 'D', which are poorly draining soils not recommended for stormwater infiltration facilities.

Ragnar fine sandy loam, 15 to 30 percent slopes (46), is situated on the valley floor directly east of the Kilchis group. The Ragnar soil group has a HSG rating of 'A' which is a well-draining soil adequate for the use of stormwater infiltration facilities.

A thin band of Norma fine sandy loam (37), HSG B/D, is situated east of the Ragnar series. This soil group appears to follow the general alignment of one of the fish-bearing streams onsite. The Norma soil group is also listed as being a potential hydric soil which is an indicator status of wetlands. Further investigation into the port

Neilton fine sandy loam, 15 to 30 percent slopes (36), HSG A, is situated east of the Norma soil group and extends to the end of the proposed roadway alignment. The Neilton soil group is well-draining and would be adequate for the use of stormwater infiltration facilities.

A map of the soil groups, as identified by the NRCS, can be found in Appendix A.

Further geotechnical exploration will be required during the final design to determine the feasibility of infiltration as a means of stormwater management.

Groundcover

The groundcover along the alignment of the roadway is mainly forested except for the portion that traverses the power corridor which is mainly covered with emergent and shrub species. Wetlands, streams and existing access roadways are also interspersed throughout the valley floor.

Adjacent Land Uses

The roadway alignment is entirely surrounded by undeveloped forest land with a bisecting Navy Railroad, natural gas corridor, power corridor and associated access roadways. The nearest single family residence is located on Archie Avenue W just over 1,500 feet from the proposed roadway alignment.

Drainage Patterns

The project is located within the Kitsap Creek basin, a sub-basin of the Chico Creek watershed. The project drains to the reach of Kitsap Creek upstream of Kitsap Lake, which is situated roughly ¾ mile downstream from the proposed roadway alignment. For further discussion of the drainage patterns of the site see Section 3.0.

Critical and Sensitive Areas

SLOPES

The valley hillside features slopes in excess of 30%. The typical slope in this portion of the alignment is roughly 50%. Further to the north and south of the proposed alignment the grades along the hillside increase to greater than 90%. For further discussion on the stability of the critical slopes along the roadway alignment see Appendix E.

STREAMS

The proposed roadway alignment crosses two fish bearing streams, a potentially unregulated ephemeral drainage and an unregulated vegetated swale. The proposed roadway alignment has minimized the direct impacts to the fish bearing streams to the greatest extent feasible by using and upgrading the existing stream crossings. To utilize these existing crossings impacts to the stream buffer are unavoidable and will be mitigated in accordance with the requirements specified within the Kitsap County Code (KCC). For further discussion on the potential impacts and proposed mitigation measures, see the Wetland and Fish and Wildlife Habitat Assessment prepared by Soundview Consultants LLC. Mitigation measures will be integrated and coordinated into the final design of the roadway as development proceeds.

WETLANDS
The valley floor features eight identified wetlands within the vicinity of the roadway alignment. The proposed roadway alignment has avoided all potential wetland fill; however, impacts to the associated wetland buffers is unavoidable and will be mitigated in accordance with the requirements specified within the KCC. For further discussion on the potential impacts and proposed mitigation measures, see the Wetland and Fish and Wildlife Habitat Assessment prepared by Soundview Consultants LLC. Mitigation measures will be integrated and coordinated into the final design of the roadway as development proceeds.

AQUIFER RECHARGE
The valley floor of the project area is identified as a Category II aquifer recharge protection area per the Kitsap County Critical Aquifer Recharge Area Map. See Appendix A for figure.

KCC 19.600.615.B requires the following protections in category II areas:

- *Applicants proposing operations that pose a potential threat to groundwater as listed in Table 19.600.620 in Category II aquifer recharge areas may be required to submit a hydrogeological report (See Chapter 19.700, Special Reports). The scope of the report shall be based on site-specific conditions.*
- *The need for additional information will be determined by the department, the health district and the affected water purveyor. Based on the results of the report, controls, mitigation, and/or other requirements will be established as a prerequisite for the development proposal being approved.*

A hydrogeological report has been prepared by GeoResources, LLC and can be found in Appendix E.

FLOODPLAIN
The proposed roadway alignment is not located within 300-ft of any Kitsap County identified floodplains. See Appendix A for figure.

Other Existing Site Information

Department of Ecology well log maps identify two water wells roughly 1,000-feet from the proposed roadway alignment. There are no known underground tanks or septic systems on or adjacent to the roadway alignment.

3.0 LEVEL 1 DOWNSTREAM ANALYSIS

Define and Map Study Area

The study area for the proposed alternative route has been limited to the entire contributing upstream basin and a quarter mile downstream from the new roadway construction from the southeastern portion of BWR to KQ. See Appendix A for the delineated study area.

Review all Available Information of the Study Area

All available information regarding existing and potential water quality, runoff volumes and rates, flooding and stream bank erosion problems within the study area have been reviewed. Reviewed material included NRSC soil information, Kitsap County GIS maps and the Draft Sub-Basin Assessment Report prepared by Parametrix. See Appendix A for appropriate maps and information.

Discussion of Downstream System

The upstream drainage basin is divided into a number of sub-basins which cross the proposed roadway through four existing aquatic features including: two fish bearing streams, a potentially unregulated ephemeral drainage and an unregulated vegetated swale.

All four aquatic features converge downstream from the project alignment into Kitsap Creek. Kitsap Creek flows northeasterly offsite through a low density residential area before discharging into Kitsap Lake. Kitsap Lake is situated over ¾ of a mile downstream from the project alignment.

Kitsap Creek was physically inspected for the presence of flooding and stream bank erosion for up to a ¼ mile downstream from the project alignment. No stream bank erosion was observed along the reach inspected; however, localized flooding due to beaver activity was observed. The localized flooding was contained to undeveloped forested areas and did not appear to have the potential to damage property or other infrastructure.

No other erosional or flooding problems are known to be associated with the delineated study area and no other problems are expected to occur as a result of the proposed development.

4.0 HYDROLOGIC & HYDRAULIC ANALYSIS

All existing and proposed basins were delineated using publically available LiDAR information from Kitsap County Geographic Information System. This information, while not precise, provides a reasonable topographic base to develop approximate basin areas for the proposed project.

Predeveloped Upstream Basin Conditions and Areas

The predeveloped site contains the following upstream basin areas and conditions:

	Basin A	Basin B	Basin C	Basin D	Basin E
Forested	11.89	12.77	6.29	46.52	4.90
Impervious	0	0	0	0.41	0.11
Total	11.89	12.77	6.29	46.93	5.01

*All areas are in acres.

See Appendix A for a figure delineating the identified upstream basins.

Developed Upstream Basin Conditions and Areas

The developed site will contain the following upstream basin areas and conditions:

	Basin A	Basin B	Basin C	Basin D	Basin E	Basin F
Forested	11.89	12.77	6.29	33.57	13.88	3.02
Impervious	0	0	0	0.20	1.05	0.49
Total	11.89	12.77	6.29	33.77	14.93	3.51

*All areas are in acres

See Appendix A for a figure delineating the identified upstream basins.

Basin A is tributary to the identified vegetated swale. This basin will be bypassed through a new culvert designed for conveyance in accordance with the SDM. No changes to the basin size are proposed.

Basin B is tributary to the identified ephemeral drainage. This drainage feature is potentially unregulated. This basin will be bypassed through a new culvert designed for conveyance in accordance with the SDM. No changes to the basin are proposed.

Basin C is tributary to a fish bearing stream. This basin currently bypasses the proposed roadway alignment through an 18" culvert. The existing culvert will be replaced with a larger fish passable structure using guidance from the WDFW standards. No changes to the existing basin are proposed. The delineated basin appears to be much smaller than what would be expected based upon field observations. It is assumed that the majority of hydrology contributing to the stream is from groundwater sources. A properly designed fish passable structure will

provide a significant factor of safety against any unknown hydrologic influences within the basin.

Basin D is tributary to a fish bearing stream. This basin currently bypasses the proposed roadway alignment through an approximately 18" culvert. This culvert will be replaced with a larger fish passage able structure using guidance from the WDFW standards. The proposed roadway intercepts a portion of the existing Basin D area which will become a part of Basin E and F below.

Basin E is entirely intercepted by the proposed roadside ditch upstream of the Navy Railroad and includes portions of the proposed roadway and adjacent upstream areas. This basin is constricted by an existing Navy culvert before being discharged to Basin F. The existing Navy culvert has been analyzed for conveyance capacity in accordance with the SDM.

Basin F includes a portion of the roadway south of the Navy railroad and adjacent upland area (portion of predeveloped Basin D). Basin F is tributary to the proposed combination detention and water quality facility. After detention and treatment this basin will be released at an appropriate location and flow rate to maintain the existing hydrologic conditions of the site per minimum requirement #8.

Flow Control

Minimum Requirement #7: Flow Control
According to Kitsap County Code (KCC) stormwater discharges shall match the developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

Minimum Requirement #8: Wetland Protection
Discharges to wetlands shall maintain the hydrologic conditions, hydrophytic vegetation, and substrate characteristics necessary to support existing and designated uses. The hydrologic analysis shall use the existing land conditions to determine the existing hydrologic conditions unless directed otherwise in the Critical Areas Ordinance codified as Title 19 to the Kitsap County Code.

To comply with minimum requirement #7 and #8, the project has sized a preliminary combined detention water quality facility for Basin E and F. Preliminary Pond 1 was sized using the Western Washington Hydrology Model 2012 (WWHM) program and was modeled accordingly:

Predeveloped Basin

Impervious	= 0 acres
C, Forested Steep	= 18.44 acres

Developed Basin

Roads/Mod	= 1.54 acres
C, Forested Steep	= 16.90 acres

Preliminary Pond 1 Summary

Required Storage Volume	= 36,155 CF
Pond Depth	= 6 FT
Pond Surface Area	= 3,397 SF

Portions of the roadway not tributary to the proposed detention facility will be mitigated through LID BMPs. Bio-retention facilities will be used where infiltration is feasible; however, in the event infiltration is determined to be infeasible, dispersion BMPs will be used. The design of these facilities will be in accordance with both the SDM and 2009 Kitsap County Low Impact Guidance Manual.

All preliminary stormwater facilities are subject to change pending the final design and alignment of the roadway.

Conveyance

The proposed on-site conveyance system will have adequate conveyance capacity to convey the 100-year design storm event as required by SDM. Design peak flows were determined using the Santa Barbara Urban Hydrograph (SBUH) Method. Conveyance sizing was further supplemented using Bentley FlowMaster software as well as criteria outlined in Section 4.4 of the SDM. Design storm events were determined from Isopluvial Maps contained within Kitsap County's LID Guidance Manual. See Appendix C for figures.

Design Storm Events

2-Year	= 3.10 inches
10-Year	= 4.30 inches
50-year	= 5.60 inches
100-Year	= 6.15 inches

Culvert A conveys the upstream flows from the vegetated swale (Basin A). See Appendix C for detailed design calculations

Summary of Results:

100-Year Peak Flow	= 5.52 cfs
Culvert Diameter	= 1.50 ft
Culvert Slope	= 0.02 ft/ft (assumed)
Exit Velocity	= 7.37 ft/s
HW/D Ratio	= 0.92 (less than 2 OK)

Culvert B conveys the upstream flows from the ephemeral drainage (Basin B). See Appendix C for detailed design calculations

Summary of Results:

100-Year Peak Flow	= 7.16 cfs
Culvert Diameter	= 1.50 ft
Culvert Slope	= 0.02 ft/ft (assumed)
Exit Velocity	= 7.88 ft/s
HW/D Ratio	= 1.15 (less than 2 OK)

Culvert C conveys the upstream flows from the fish bearing stream (Basin C). The analysis below shows the culvert as sized for conveyance, not fish passage. The final design will feature a structure of significantly greater capacity to comply with fish passage design requirements. See Appendix C for detailed design calculations.

Summary of Results:

100-Year Peak Flow	= 1.92 cfs
Culvert Diameter	= 1.50 ft
Culvert Slope	= 0.02 ft/ft (assumed)
Exit Velocity	= 5.49 ft/s
HW/D Ratio	= 0.50 (less than 2 OK)

Culvert D conveys the upstream flows from the fish bearing stream (Basin D). The analysis below shows the culvert as sized for conveyance, not fish passage. The final design will feature a structure of significantly greater capacity to comply with fish passage design requirements. See Appendix C for detailed design calculations

Summary of Results:

100-Year Peak Flow	= 16.95 cfs
Culvert Diameter	= 2 ft
Culvert Slope	= 0.02 ft/ft (assumed)
Exit Velocity	= 9.77 ft/s
HW/D	= 1.39 (less than 1.5 OK)

Culvert E is an existing Navy culvert which crosses the existing Navy railroad. Culvert E will convey the stormwater runoff from the hillside and new roadway (Basin E). See Appendix C for detailed design calculations

Summary of Results:

100-Year Peak Flow	= 7.40 cfs
Culvert Diameter	= 1.5 ft (existing)
Culvert Slope	= 0.122 ft/ft (existing)
Exit Velocity	= 15.41 ft/s
HW/D	= 1.18 (less than 2 OK)

Culvert F conveys the stormwater runoff from the hillside and new roadway to Culvert E (Basin E). See Appendix C for detailed design calculations

Summary of Results:

100-Year Peak Flow	= 7.40 cfs
Culvert Diameter	= 1.5 ft
Culvert Slope	= 0.103 ft/ft (design)
Exit Velocity	= 8.74 ft/s
HW/D	= 1.18 (less than 2 OK)

Roadside Ditch Above Culvert F

Located adjacent the proposed roadway, the roadside ditch will have a height of 1.5-ft, 1-ft bottom width and 2:1 side slopes. The ditch will be grass-lined where slopes are less than 6% and rock lined where slopes are greater than 6%. Additional velocity reduction measures such as check dams may be utilized during final design.

Summary of Results:

100-Year Peak Flow	= 7.40 cfs (Basin E)
Normal Depth	= 0.71 ft
Freeboard	= 0.79 ft (greater than 0.5 OK)
Velocity	= 4.31 fps

Roadside Ditch Below Culvert E

Located adjacent the proposed roadway, the roadside ditch will have a height of 1.5-ft, 1-ft bottom width and 2:1 side slopes. The ditch will be grass-lined where slopes are less than 6% and rock lined where slopes are greater than 6%. Additional velocity reduction measures such as check dams may be utilized during final design.

Summary of Results:

100-Year Peak Flow	= 14.34 cfs (Combined Basin E and F)
Normal Depth	= 0.96 ft
Freeboard	= 0.54 ft (greater than 0.5 OK)
Velocity	= 5.10 fps

All conveyance facilities are subject to change pending the final design and alignment of the roadway.

Water Quality

Due to the presence of fish bearing streams, enhanced treatment is required for all proposed pollution generating surfaces. To satisfy the enhanced treatment requirements, the project proposes a combined detention and water quality facility. The required wetpool volume of this facility was determined to be 9,634 cubic feet. For more detailed water quality calculations see Appendix D.

Portions of the roadway not tributary to the proposed water quality facility will be mitigated through applicable and feasible LID BMPs.

All preliminary water quality facilities are subject to change pending the final design and alignment of the roadway.

APPENDIX A

General Exhibits

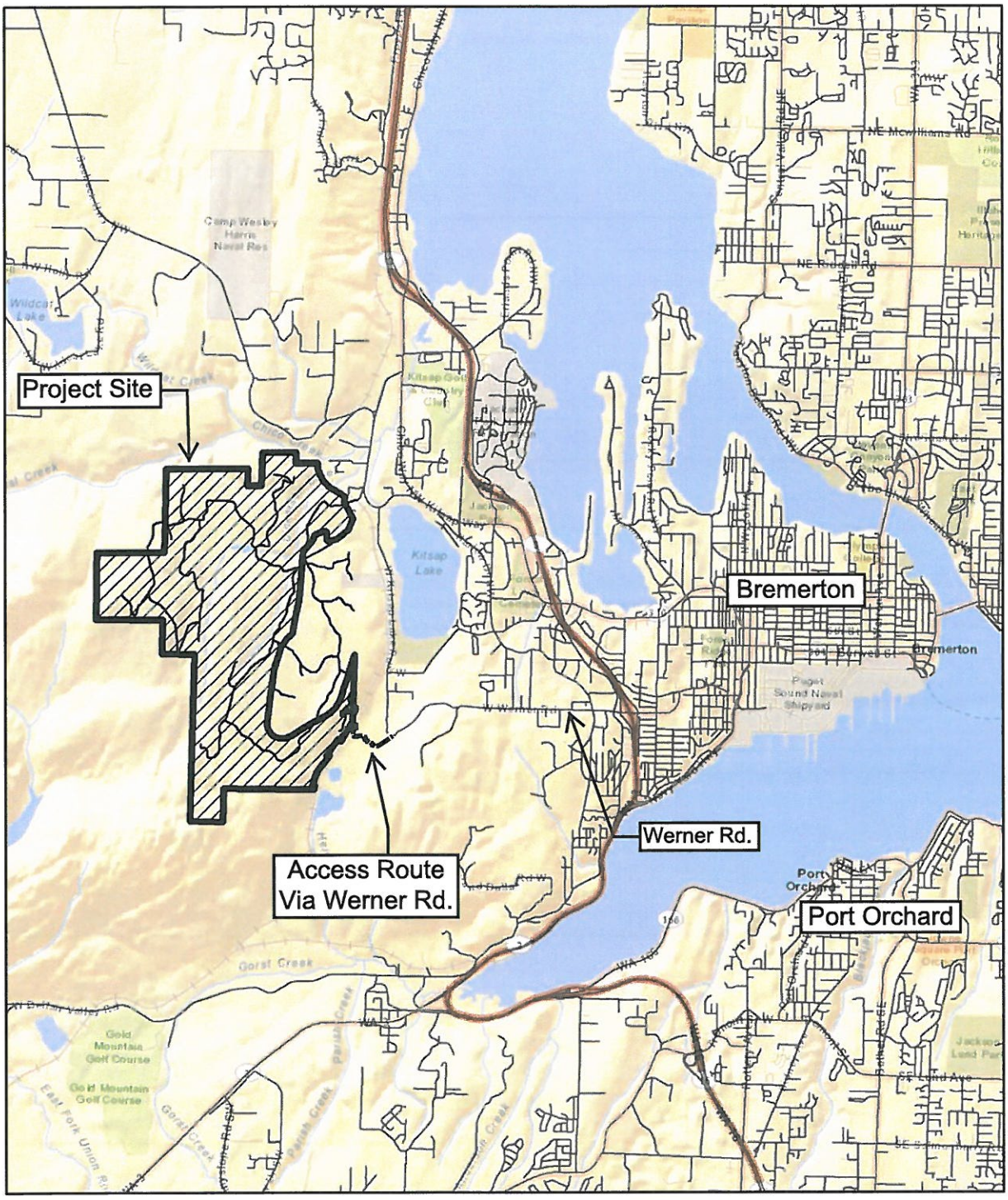


FIGURE 1-1
Project Vicinity

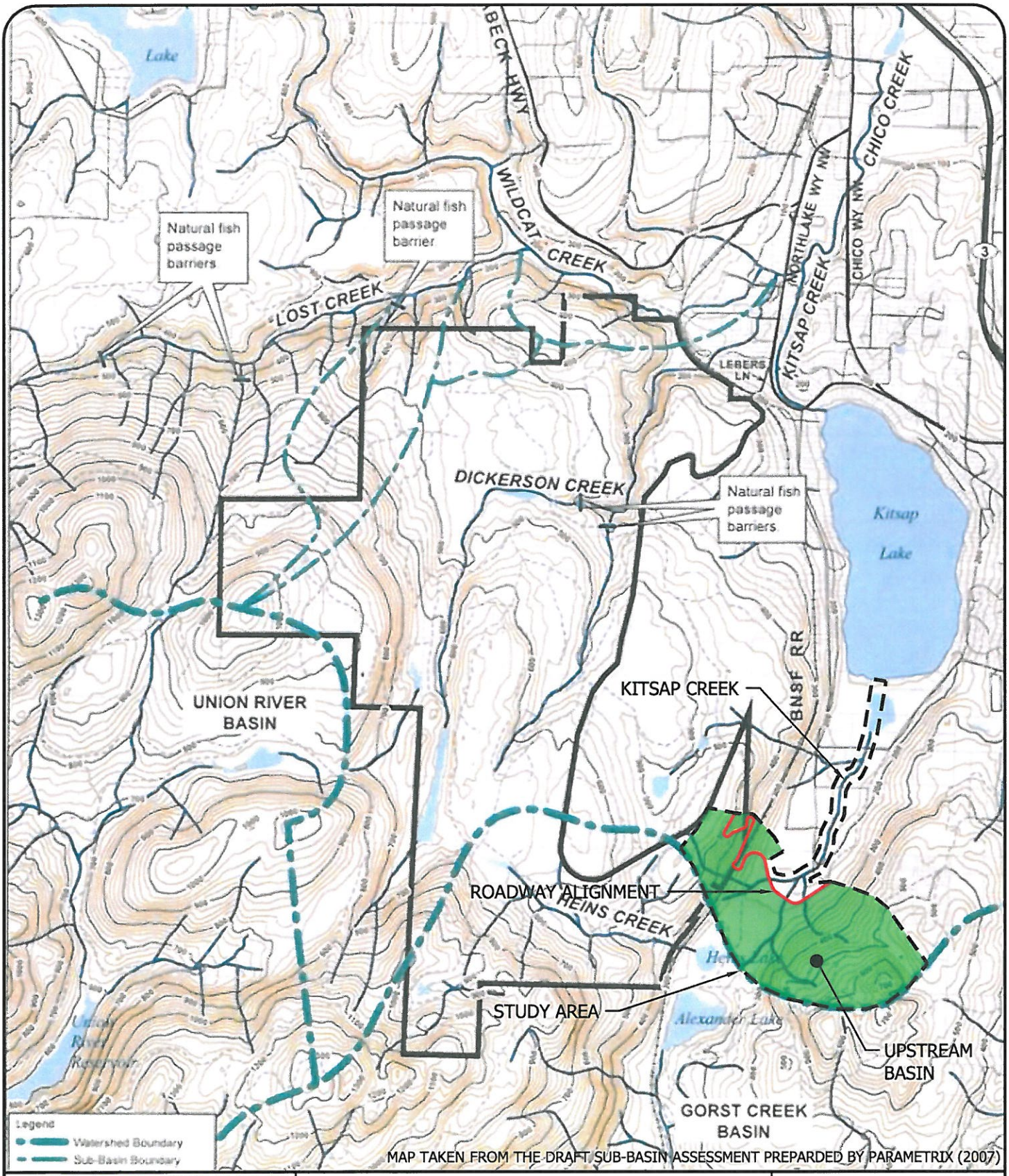
0 3,000 6,000 Feet

Cascadia Pacific Group LLC
cascadiapacificgroup.com

N

Legend

- New Access Rd.
- UTF Site
- Existing Roads



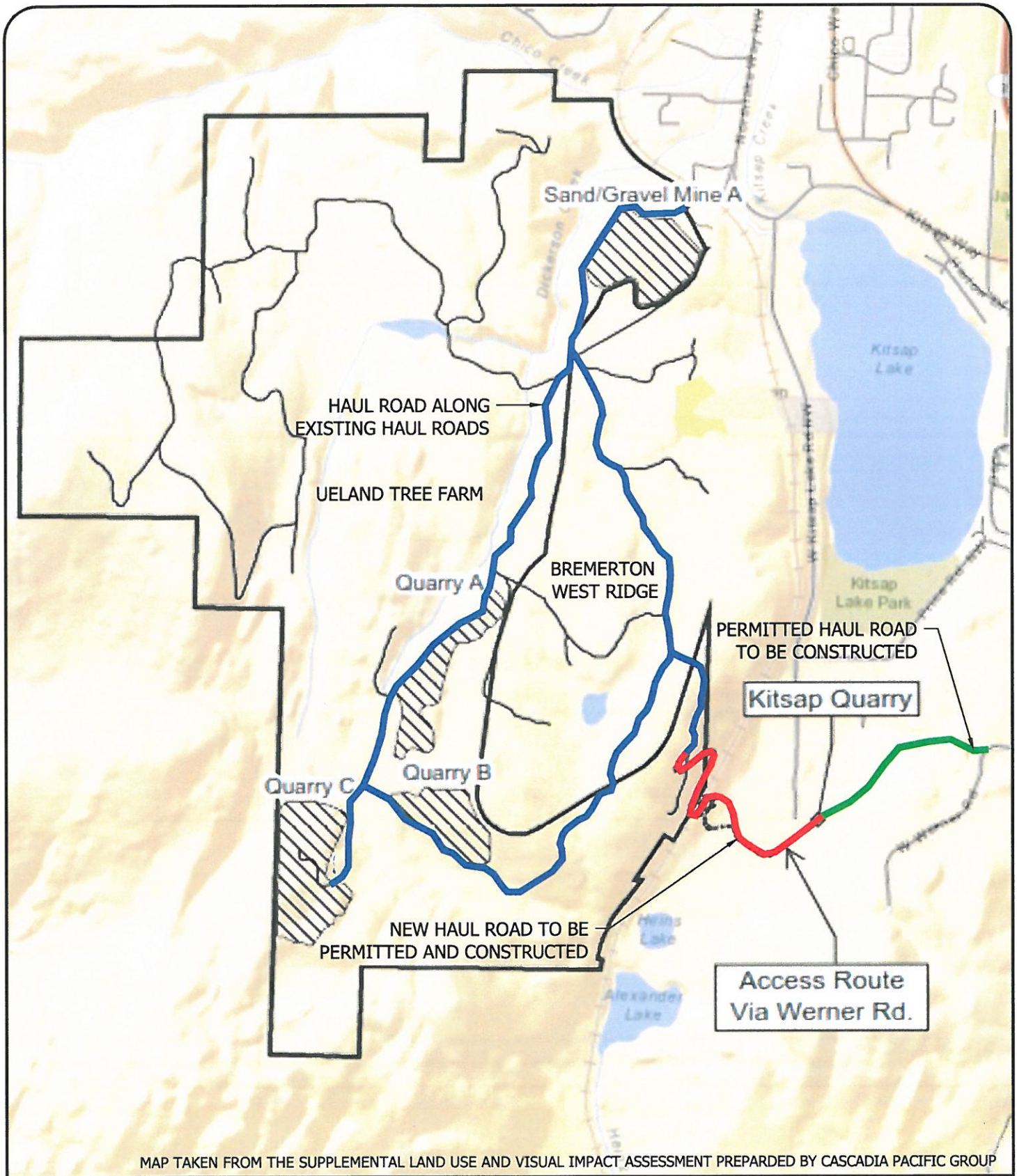
MAP TAKEN FROM THE DRAFT SUB-BASIN ASSESSMENT PREPARDED BY PARAMETRIX (2007)

CONTOUR ENGINEERING · LLC
3309 56TH ST NW SUITE 106
GIG HARBOR WA 98335
PHONE: (253) 857-5454
FAX: (253) 857-0044

STUDY AREA

UELAND TREE FARM
KITSAP COUNTY, WASHIGNTON

DRAWN BY:	K. MAUREN
PROJECT:	13-094
DATE:	3.19.14
EXHIBIT NO.	1



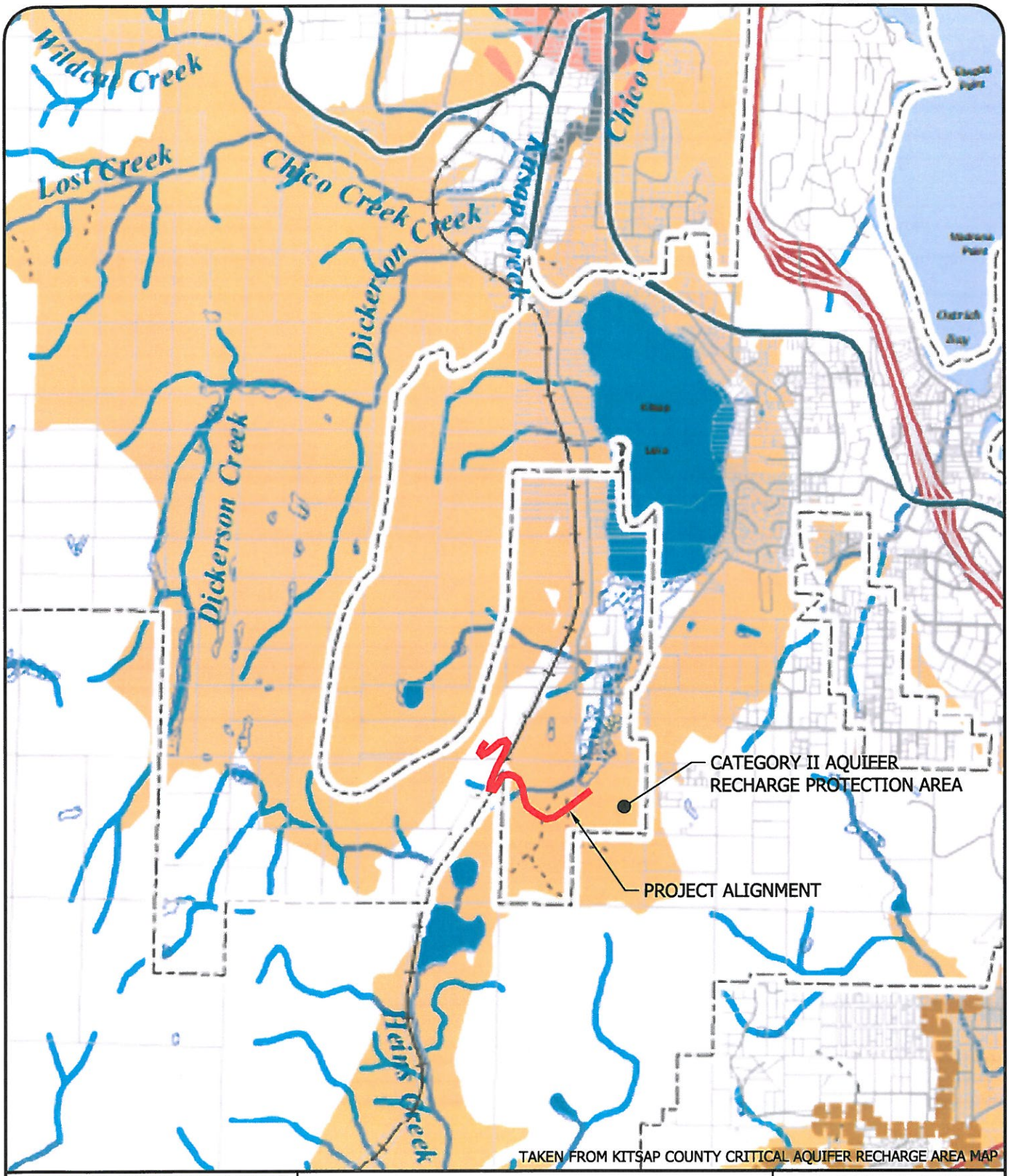
MAP TAKEN FROM THE SUPPLEMENTAL LAND USE AND VISUAL IMPACT ASSESSMENT PREPARDED BY CASCADIA PACIFIC GROUP

CONTOUR
ENGINEERING · LLC
3309 56TH ST NW SUITE 106
GIG HARBOR WA 98335
PHONE: (253) 857-5454
FAX: (253) 857-0044

ACCESS ROUTE

UELAND TREE FARM
KITSAP COUNTY, WASHIGNTON

DRAWN BY:	K. MAUREN
PROJECT:	13-094
DATE:	3.19.14
EXHIBIT NO.	2

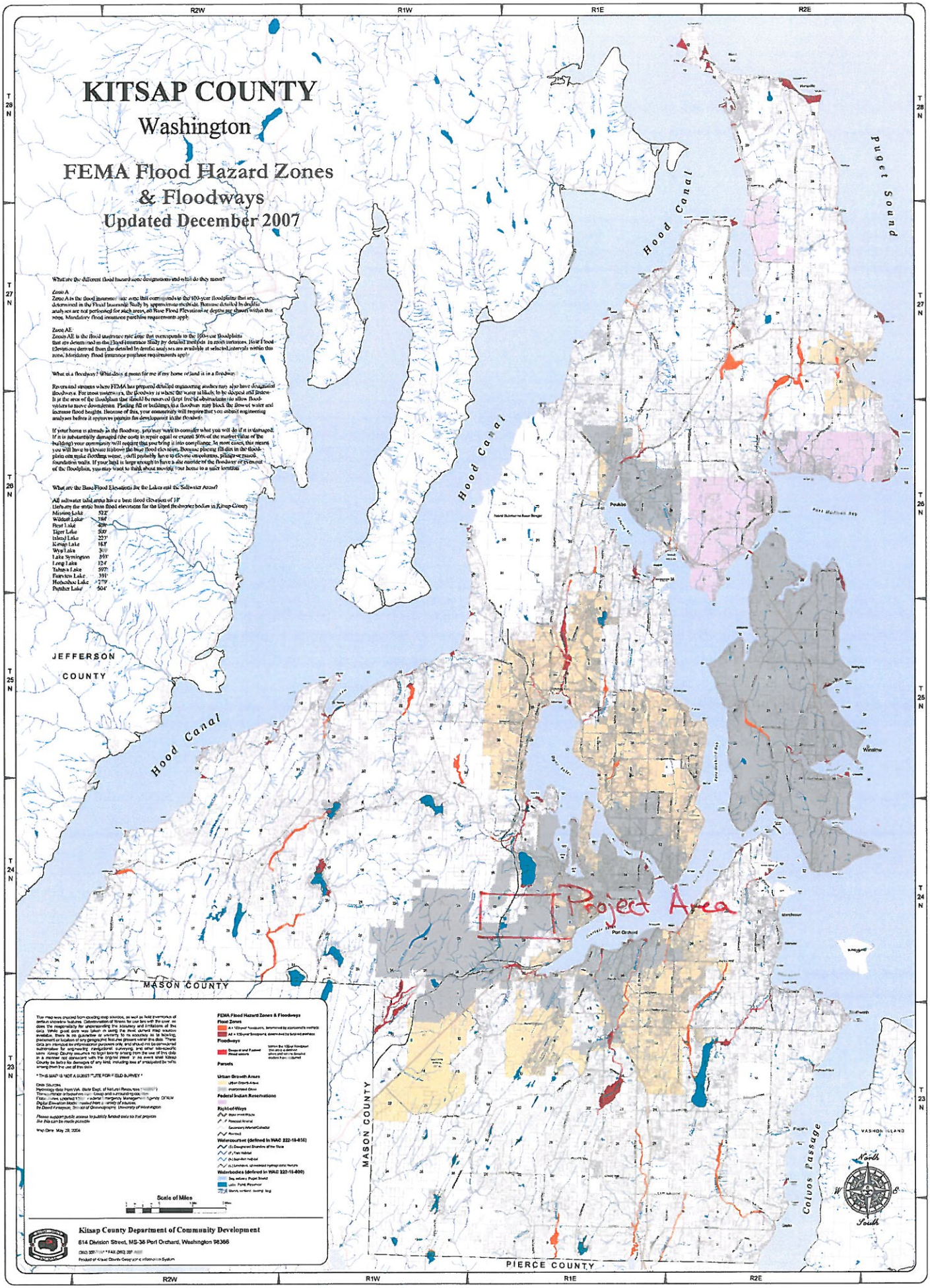


CONTOUR ENGINEERING, LLC
3309 56TH ST NW SUITE 106
GIG HARBOR WA 98335
PHONE: (253) 857-5454
FAX: (253) 857-0044

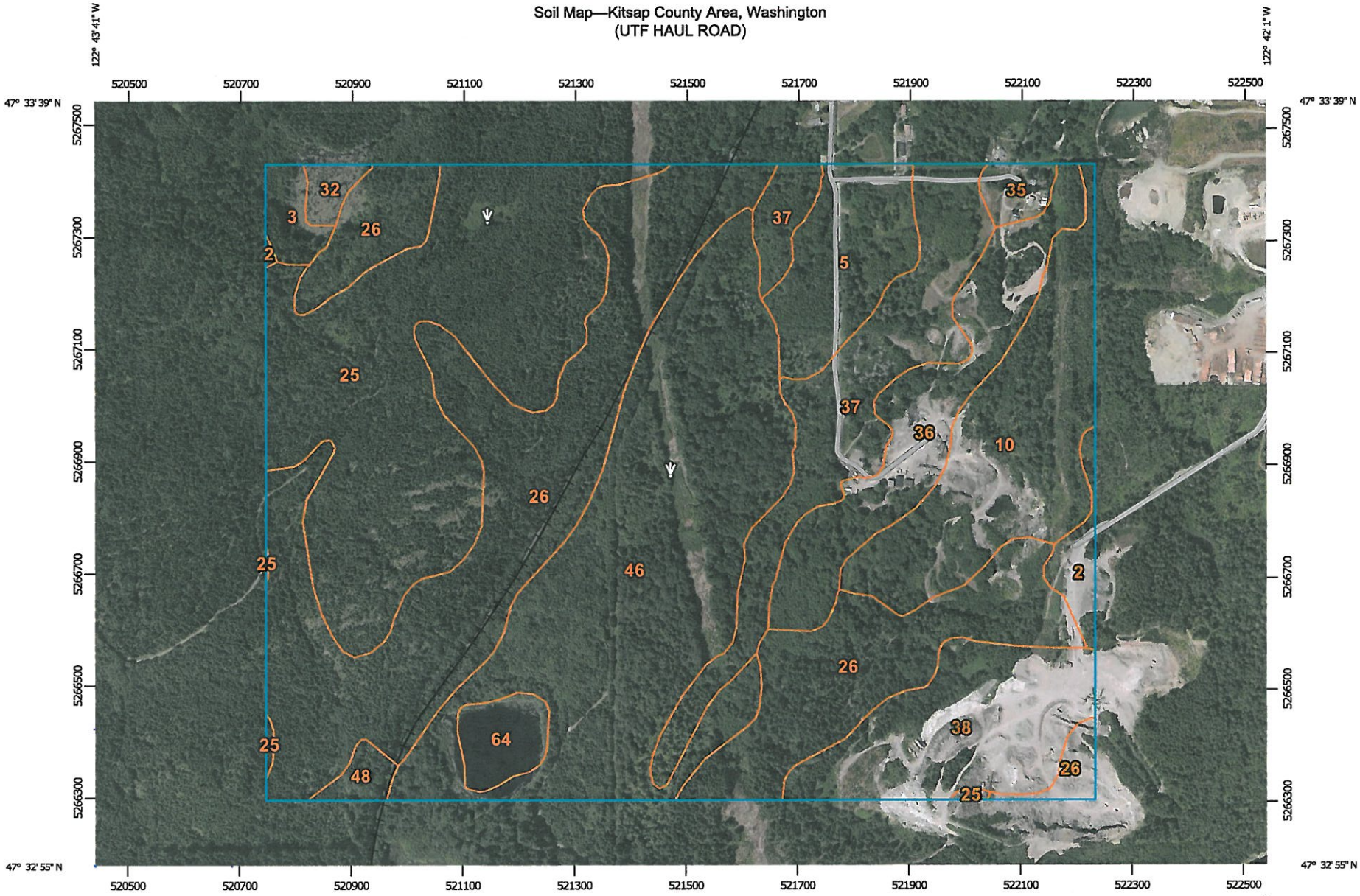
AQUIFER PROTECTION AREA MAP

UELAND TREE FARM
KITSAP COUNTY, WASHIGNTON

DRAWN BY:	K. MAUREN
PROJECT:	13-094
DATE:	3.19.14
EXHIBIT NO.	3


KITSAP COUNTY
Washington
FEMA Flood Hazard Zones
& Floodways
Updated December 2007
What are the different flood hazard zone designations and what do they mean?
Zone A
Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.
Zone AE
Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined on the Flood Insurance Study by detailed methods. In most instances, Base Flood Elevations derived from the detailed hydraulic analyses are available at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.
What is a floodway? What does it mean for me if my home or land is in a floodway
Rivers and streams where FEMA has prepared detailed engineering studies may also have designated floodways. For most instances, the floodway is where the water is likely to be deepest and fastest. It is the area of the floodplain that should be reserved (kept free of obstructions) to allow floodwaters to move downstream. Placing fill or buildings in a floodway may block the flow of water and increase flood heights. Because of this, your community will require that you submit engineering analyses before it approves permits for development in the floodway.
If your home is already in the floodway, you may want to consider what you will do if it is damaged. If it is substantially damaged (the costs to repair equal or exceed 50% of the market value of the building) your community will require that you bring it into compliance. In most cases, this means you will have to elevate it above the base flood elevation. Because placing fill dirt in the floodplain can make flooding worse, you'll probably have to elevate on columns, pilings or raised foundation walls. If your land is large enough to have a site outside of the floodway or even out of the floodplain, you may want to think about moving your home to a safer location.
What are the Base Flood Elevations for the Lakes and the Saltwater Areas?
All saltwater tidal areas have a base flood elevation of 10'
Here are the static base flood elevations for the listed freshwater bodies in Kitsap County
Mission Lake 322'
Wildcat Lake 196'
Pearl Lake 420'
Tiger Lake 300'
Island Lake 223'
Kitsap Lake 163'
Wye Lake 301'
Lake Symington 393'
Long Lake 124'
Tahuya Lake 597'
Fairview Lake 391'
Horseshoe Lake 279'
Panther Lake 504'
JEFFERSON COUNTY
MASON COUNTY
PIERCE COUNTY
Hood Canal
Hood Canal
Hood Canal
Puget Sound
Project Area
Port Orchard
Poulsbo
Winslow
Colvos Passage
VASHON ISLAND
North
West
East
South
FEMA Flood Hazard Zones & Floodways
Flood Zones
Floodways
Parcels
Urban Growth Areas
Federal Indian Reservations
Right-of-Ways
Watercourses (defined in WAC 222-16-030)
Waterbodies (defined in WAC 222-16-030)
Scale of Miles
Kitsap County Department of Community Development
614 Division Street, MS-36 Port Orchard, Washington 98366

Soil Map—Kitsap County Area, Washington
(UTF HAUL ROAD)



Map Scale: 1:9,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 100 200 400 600

Feet
0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Kitsap County Area, Washington
Survey Area Data: Version 8, Dec 10, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 9, 2010—Aug 20, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Kitsap County Area, Washington (WA635)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
2	Alderwood very gravelly sandy loam, 6 to 15 percent slopes	4.0	1.0%
3	Alderwood very gravelly sandy loam, 15 to 30 percent slopes	3.6	0.9%
5	Belfast loam	16.5	3.9%
10	Dystric Xerorthents, 45 to 70 percent slopes	33.7	8.1%
25	Kilchis very gravelly sandy loam, 15 to 30 percent slopes	73.4	17.5%
26	Kilchis very gravelly sandy loam, 30 to 70 percent slopes	107.8	25.8%
32	McKenna gravelly loam	2.1	0.5%
35	Neilton gravelly loamy sand, 3 to 15 percent slopes	3.0	0.7%
36	Neilton gravelly loamy sand, 15 to 30 percent slopes	24.9	6.0%
37	Norma fine sandy loam	34.1	8.2%
38	Pits	26.1	6.2%
46	Ragnar fine sandy loam, 15 to 30 percent slopes	81.1	19.4%
48	Schneider very gravelly loam, 45 to 70 percent slopes	2.3	0.6%
64	Water	5.5	1.3%
Totals for Area of Interest		**418.3**	**100.0%**

GRAPHIC SCALE
0 200 400
1 INCH = 400 FEET (11"x17")

EXISTING HAUL ROAD

NEW HAUL ROAD

DEPRESSIONAL WETLAND
(NO OUTLET)

LEGEND

BASIN A	517,761 SF (11.89 AC)
BASIN B	556,092 SF (12.77 AC)
BASIN C	274,180 SF (6.29 AC)
BASIN D	2,044,119 SF (46.93 AC)
BASIN E	218,090 SF (5.01 AC)

CONTOUR ENGINEERING, LLC
CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourpllc.com

PREDEVELOPED BASIN MAP

UELAND TREE FARM
KITSAP COUNTY, WA

BY:	K. MAUREN
PROJECT:	13-094
DATE:	5.23.14
EXHIBIT NO.	4

GRAPHIC SCALE
0 200 400
1 INCH = 400 FEET (11"x17")

EXISTING HAUL ROAD

NEW HAUL ROAD

LEGEND

BASIN A	517,761 SF (11.89 AC)
BASIN B	556,092 SF (12.77 AC)
BASIN C	274,180 SF (6.29 AC)
BASIN D	1,471,385 SF (33.77 AC)
BASIN E	650,183 SF (14.93 AC)
BASIN F	152,798 SF (3.51 AC)

CONTOUR ENGINEERING, LLC
CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourpllc.com

DEVELOPED BASIN MAP

UELAND TREE FARM
KITSAP COUNTY, WA

BY:	K. MAUREN
PROJECT:	13-094
DATE:	5.23.14
EXHIBIT NO.	5

APPENDIX B

Preliminary Flow Control Analysis

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	13-094 POND1
Site Name:	
Site Address:	
City:	
Report Date:	5/23/2014
Gage:	Quilcene
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	Hourly
Precip Scale:	0.80
Version:	2014/03/21

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data
Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	Acres
C, Forest, Steep	18.44
Pervious Total	18.44

Impervious Land Use	Acres
Impervious Total	0
Basin Total	18.44

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	Acres
C, Forest, Steep	16.9
Pervious Total	16.9

Impervious Land Use	Acres
ROADS MOD	1.54
Impervious Total	1.54
Basin Total	18.44

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	58.28 ft.
Bottom Width:	58.28 ft.
Depth:	7 ft.
Volume at riser head:	0.8300 acre-ft.
Side slope 1:	3 To 1
Side slope 2:	3 To 1
Side slope 3:	3 To 1
Side slope 4:	3 To 1
Discharge Structure	
Riser Height:	6 ft.
Riser Diameter:	18 in.
Notch Type:	Rectangular
Notch Width:	0.110 ft.
Notch Height:	2.841 ft.
Orifice 1 Diameter:	3.994 in. Elevation:0 ft.
Element Flows To:	
Outlet 1	Outlet 2

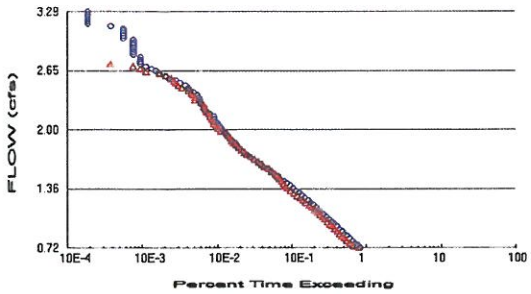
Pond Hydraulic Table

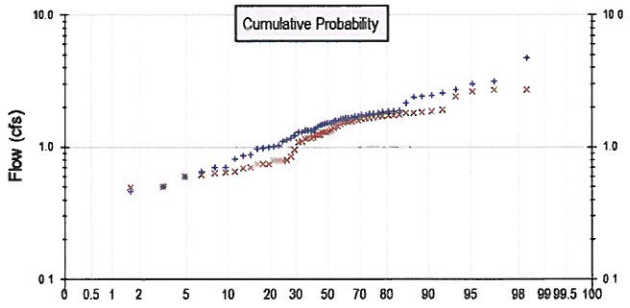
Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.078	0.000	0.000	0.000
0.0778	0.079	0.006	0.116	0.000
0.1556	0.080	0.012	0.165	0.000
0.2333	0.081	0.018	0.202	0.000
0.3111	0.083	0.025	0.233	0.000
0.3889	0.084	0.031	0.261	0.000
0.4667	0.085	0.038	0.286	0.000
0.5444	0.087	0.044	0.309	0.000
0.6222	0.088	0.051	0.330	0.000
0.7000	0.089	0.058	0.350	0.000
0.7778	0.091	0.065	0.369	0.000
0.8556	0.092	0.072	0.387	0.000
0.9333	0.093	0.080	0.404	0.000
1.0111	0.095	0.087	0.421	0.000
1.0889	0.096	0.094	0.437	0.000
1.1667	0.097	0.102	0.452	0.000
1.2444	0.099	0.110	0.467	0.000
1.3222	0.100	0.117	0.481	0.000
1.4000	0.102	0.125	0.495	0.000
1.4778	0.103	0.133	0.509	0.000
1.5556	0.105	0.141	0.522	0.000
1.6333	0.106	0.150	0.535	0.000
1.7111	0.107	0.158	0.548	0.000
1.7889	0.109	0.166	0.560	0.000
1.8667	0.110	0.175	0.572	0.000
1.9444	0.112	0.184	0.584	0.000
2.0222	0.113	0.192	0.595	0.000
2.1000	0.115	0.201	0.607	0.000
2.1778	0.116	0.210	0.618	0.000
2.2556	0.118	0.219	0.629	0.000
2.3333	0.119	0.229	0.640	0.000
2.4111	0.121	0.238	0.650	0.000

2.4889	0.123	0.248	0.661	0.000
2.5667	0.124	0.257	0.671	0.000
2.6444	0.126	0.267	0.681	0.000
2.7222	0.127	0.277	0.691	0.000
2.8000	0.129	0.287	0.701	0.000
2.8778	0.131	0.297	0.710	0.000
2.9556	0.132	0.307	0.720	0.000
3.0333	0.134	0.318	0.729	0.000
3.1111	0.135	0.328	0.739	0.000
3.1889	0.137	0.339	0.750	0.000
3.2667	0.139	0.350	0.769	0.000
3.3444	0.140	0.360	0.794	0.000
3.4222	0.142	0.371	0.821	0.000
3.5000	0.144	0.383	0.851	0.000
3.5778	0.146	0.394	0.883	0.000
3.6556	0.147	0.405	0.916	0.000
3.7333	0.149	0.417	0.950	0.000
3.8111	0.151	0.429	0.985	0.000
3.8889	0.152	0.440	1.021	0.000
3.9667	0.154	0.452	1.057	0.000
4.0444	0.156	0.464	1.093	0.000
4.1222	0.158	0.477	1.130	0.000
4.2000	0.160	0.489	1.169	0.000
4.2778	0.161	0.502	1.213	0.000
4.3556	0.163	0.514	1.257	0.000
4.4333	0.165	0.527	1.303	0.000
4.5111	0.167	0.540	1.350	0.000
4.5889	0.169	0.553	1.537	0.000
4.6667	0.170	0.566	1.598	0.000
4.7444	0.172	0.580	1.659	0.000
4.8222	0.174	0.593	1.723	0.000
4.9000	0.176	0.607	1.787	0.000
4.9778	0.178	0.621	1.853	0.000
5.0556	0.180	0.635	1.919	0.000
5.1333	0.182	0.649	1.987	0.000
5.2111	0.184	0.663	2.056	0.000
5.2889	0.186	0.677	2.127	0.000
5.3667	0.187	0.692	2.198	0.000
5.4444	0.189	0.707	2.271	0.000
5.5222	0.191	0.721	2.344	0.000
5.6000	0.193	0.736	2.419	0.000
5.6778	0.195	0.751	2.494	0.000
5.7556	0.197	0.767	2.571	0.000
5.8333	0.199	0.782	2.649	0.000
5.9111	0.201	0.798	2.727	0.000
5.9889	0.203	0.814	2.807	0.000
6.0667	0.205	0.830	3.076	0.000
6.1444	0.207	0.846	3.633	0.000
6.2222	0.209	0.862	4.368	0.000
6.3000	0.211	0.878	5.244	0.000
6.3778	0.214	0.895	6.242	0.000
6.4556	0.216	0.912	7.349	0.000
6.5333	0.218	0.928	8.553	0.000
6.6111	0.220	0.946	9.848	0.000
6.6889	0.222	0.963	11.22	0.000
6.7667	0.224	0.980	12.68	0.000
6.8444	0.226	0.998	14.22	0.000
6.9222	0.228	1.015	15.83	0.000

7.0000	0.230	1.033	17.51	0.000
7.0778	0.233	1.051	19.25	0.000

Analysis Results
POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 18.44
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 16.9
Total Impervious Area: 1.54

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	1.437706
5 year	2.08009
10 year	2.480738
25 year	2.956531
50 year	3.289547
100 year	3.605369

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	1.231952
5 year	1.757713
10 year	2.091058
25 year	2.494038
50 year	2.781326
100 year	3.05815

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	2.999	1.861
1950	1.094	0.844
1951	1.651	1.700
1952	1.025	0.740
1953	1.561	1.192
1954	1.872	1.730
1955	1.744	1.537
1956	4.700	1.344
1957	1.517	1.574
1958	1.481	1.297

1959	2.551	2.629
1960	1.830	1.842
1961	1.415	1.239
1962	1.377	1.292
1963	1.517	1.394
1964	1.138	0.949
1965	0.596	0.617
1966	2.399	1.109
1967	1.698	1.686
1968	1.485	1.506
1969	1.356	1.297
1970	1.298	1.241
1971	1.778	1.561
1972	1.712	1.556
1973	1.523	1.424
1974	1.797	1.816
1975	1.336	1.155
1976	1.764	1.436
1977	0.972	0.790
1978	1.302	1.174
1979	1.588	1.593
1980	1.220	1.084
1981	0.979	0.743
1982	0.807	0.650
1983	1.849	1.759
1984	0.701	0.629
1985	0.457	0.503
1986	1.636	1.667
1987	1.339	1.168
1988	0.877	0.797
1989	0.647	0.601
1990	0.706	0.643
1991	1.663	1.654
1992	1.889	1.920
1993	1.009	0.788
1994	2.431	2.429
1995	1.785	1.798
1996	1.682	1.733
1997	1.334	1.303
1998	1.593	1.564
1999	2.706	2.732
2000	1.462	0.748
2001	0.396	0.476
2002	2.161	1.238
2003	3.152	2.731
2004	0.866	0.700
2005	0.998	0.687
2006	2.457	1.699
2007	1.162	0.791
2008	1.623	1.625
2009	0.503	0.492

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	4.6995	2.7318
2	3.1517	2.7307
3	2.9987	2.6287

4	2.7057	2.4293
5	2.5510	1.9199
6	2.4567	1.8605
7	2.4315	1.8424
8	2.3993	1.8161
9	2.1606	1.7977
10	1.8895	1.7593
11	1.8718	1.7331
12	1.8488	1.7300
13	1.8298	1.6996
14	1.7970	1.6991
15	1.7848	1.6863
16	1.7778	1.6671
17	1.7643	1.6543
18	1.7439	1.6255
19	1.7118	1.5933
20	1.6977	1.5743
21	1.6821	1.5642
22	1.6626	1.5611
23	1.6506	1.5559
24	1.6359	1.5370
25	1.6229	1.5065
26	1.5927	1.4363
27	1.5880	1.4238
28	1.5613	1.3939
29	1.5233	1.3436
30	1.5169	1.3031
31	1.5168	1.2971
32	1.4853	1.2968
33	1.4806	1.2918
34	1.4620	1.2409
35	1.4151	1.2385
36	1.3768	1.2379
37	1.3557	1.1919
38	1.3386	1.1745
39	1.3363	1.1682
40	1.3343	1.1554
41	1.3021	1.1093
42	1.2975	1.0838
43	1.2195	0.9488
44	1.1622	0.8443
45	1.1377	0.7973
46	1.0944	0.7914
47	1.0246	0.7905
48	1.0086	0.7881
49	0.9980	0.7475
50	0.9789	0.7434
51	0.9716	0.7403
52	0.8770	0.7000
53	0.8658	0.6871
54	0.8069	0.6498
55	0.7059	0.6426
56	0.7006	0.6293
57	0.6473	0.6172
58	0.5959	0.6014
59	0.5030	0.5027
60	0.4571	0.4923
61	0.3964	0.4760

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.7189	4383	4187	95	Pass
0.7448	4051	3589	88	Pass
0.7708	3747	3218	85	Pass
0.7968	3465	2911	84	Pass
0.8227	3180	2694	84	Pass
0.8487	2929	2497	85	Pass
0.8747	2705	2317	85	Pass
0.9006	2509	2154	85	Pass
0.9266	2291	2000	87	Pass
0.9526	2121	1851	87	Pass
0.9785	1947	1727	88	Pass
1.0045	1803	1600	88	Pass
1.0305	1651	1476	89	Pass
1.0564	1537	1376	89	Pass
1.0824	1414	1280	90	Pass
1.1084	1317	1190	90	Pass
1.1343	1215	1093	89	Pass
1.1603	1126	989	87	Pass
1.1863	1041	912	87	Pass
1.2122	950	823	86	Pass
1.2382	875	754	86	Pass
1.2642	791	688	86	Pass
1.2901	732	625	85	Pass
1.3161	663	566	85	Pass
1.3421	602	506	84	Pass
1.3680	547	464	84	Pass
1.3940	503	437	86	Pass
1.4200	458	410	89	Pass
1.4459	421	384	91	Pass
1.4719	369	359	97	Pass
1.4979	341	336	98	Pass
1.5238	305	319	104	Pass
1.5498	274	290	105	Pass
1.5758	253	264	104	Pass
1.6017	225	230	102	Pass
1.6277	199	214	107	Pass
1.6537	181	191	105	Pass
1.6796	165	169	102	Pass
1.7056	145	150	103	Pass
1.7316	131	134	102	Pass
1.7575	119	123	103	Pass
1.7835	110	113	102	Pass
1.8095	102	103	100	Pass
1.8354	97	95	97	Pass
1.8614	91	88	96	Pass
1.8874	84	83	98	Pass
1.9133	77	80	103	Pass
1.9393	73	75	102	Pass
1.9653	68	72	105	Pass
1.9912	63	60	95	Pass
2.0172	61	55	90	Pass
2.0431	57	52	91	Pass
2.0691	55	48	87	Pass

2.0951	52	47	90	Pass
2.1210	49	45	91	Pass
2.1470	48	43	89	Pass
2.1730	42	41	97	Pass
2.1989	38	38	100	Pass
2.2249	36	37	102	Pass
2.2509	36	35	97	Pass
2.2768	33	35	106	Pass
2.3028	31	32	103	Pass
2.3288	31	27	87	Pass
2.3547	30	27	90	Pass
2.3807	29	25	86	Pass
2.4067	26	24	92	Pass
2.4326	23	22	95	Pass
2.4586	22	18	81	Pass
2.4846	20	16	80	Pass
2.5105	17	15	88	Pass
2.5365	15	14	93	Pass
2.5625	12	13	108	Pass
2.5884	11	11	100	Pass
2.6144	9	9	100	Pass
2.6404	8	6	75	Pass
2.6663	7	5	71	Pass
2.6923	6	4	66	Pass
2.7183	5	2	40	Pass
2.7442	5	0	0	Pass
2.7702	5	0	0	Pass
2.7962	5	0	0	Pass
2.8221	4	0	0	Pass
2.8481	4	0	0	Pass
2.8741	4	0	0	Pass
2.9000	4	0	0	Pass
2.9260	4	0	0	Pass
2.9520	4	0	0	Pass
2.9779	4	0	0	Pass
3.0039	3	0	0	Pass
3.0299	3	0	0	Pass
3.0558	3	0	0	Pass
3.0818	3	0	0	Pass
3.1078	3	0	0	Pass
3.1337	2	0	0	Pass
3.1597	1	0	0	Pass
3.1857	1	0	0	Pass
3.2116	1	0	0	Pass
3.2376	1	0	0	Pass
3.2636	1	0	0	Pass
3.2895	1	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	1562.59			☐	0.00			
Total Volume Infiltrated		1562.59	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50-yr									Duration Analysis Result = Failed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

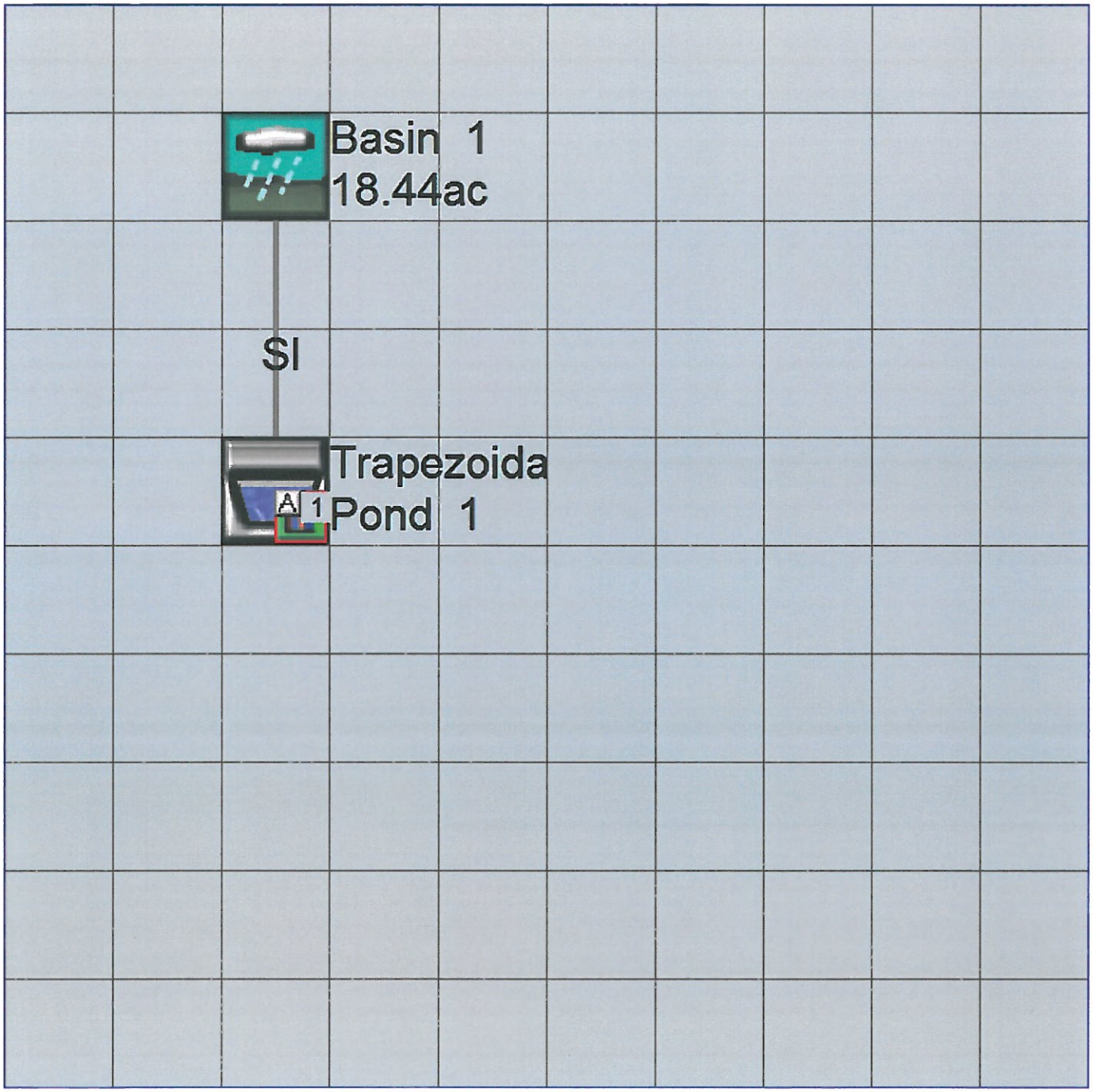
No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic

Mitigated Schematic



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Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
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APPENDIX C

Preliminary Conveyance Analysis

Figure 5-1 ISOPLUVIAL MAP - 2 YEAR

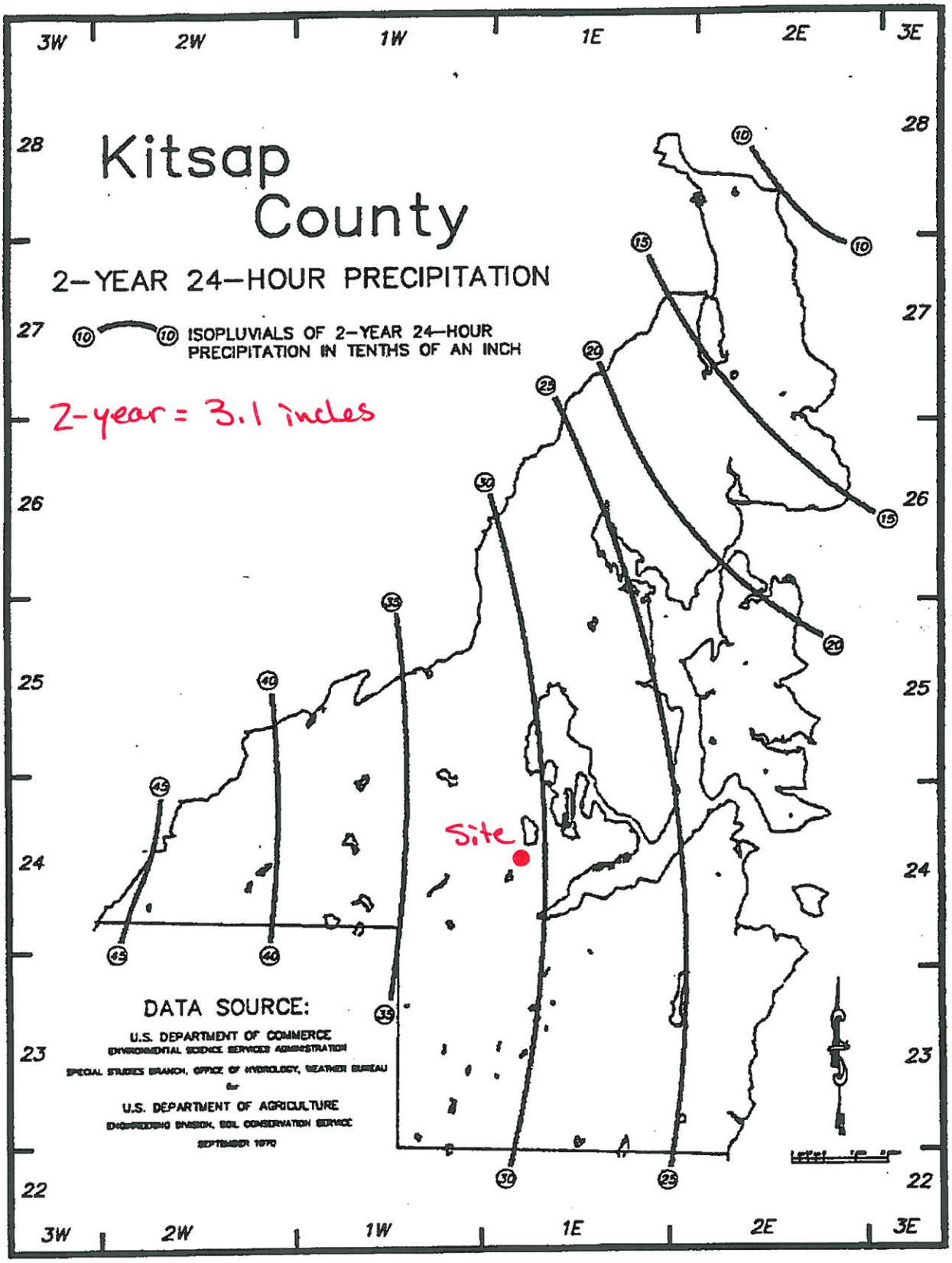


FIGURE 5-3 ISOPLUVIAL MAP - 10 YEAR

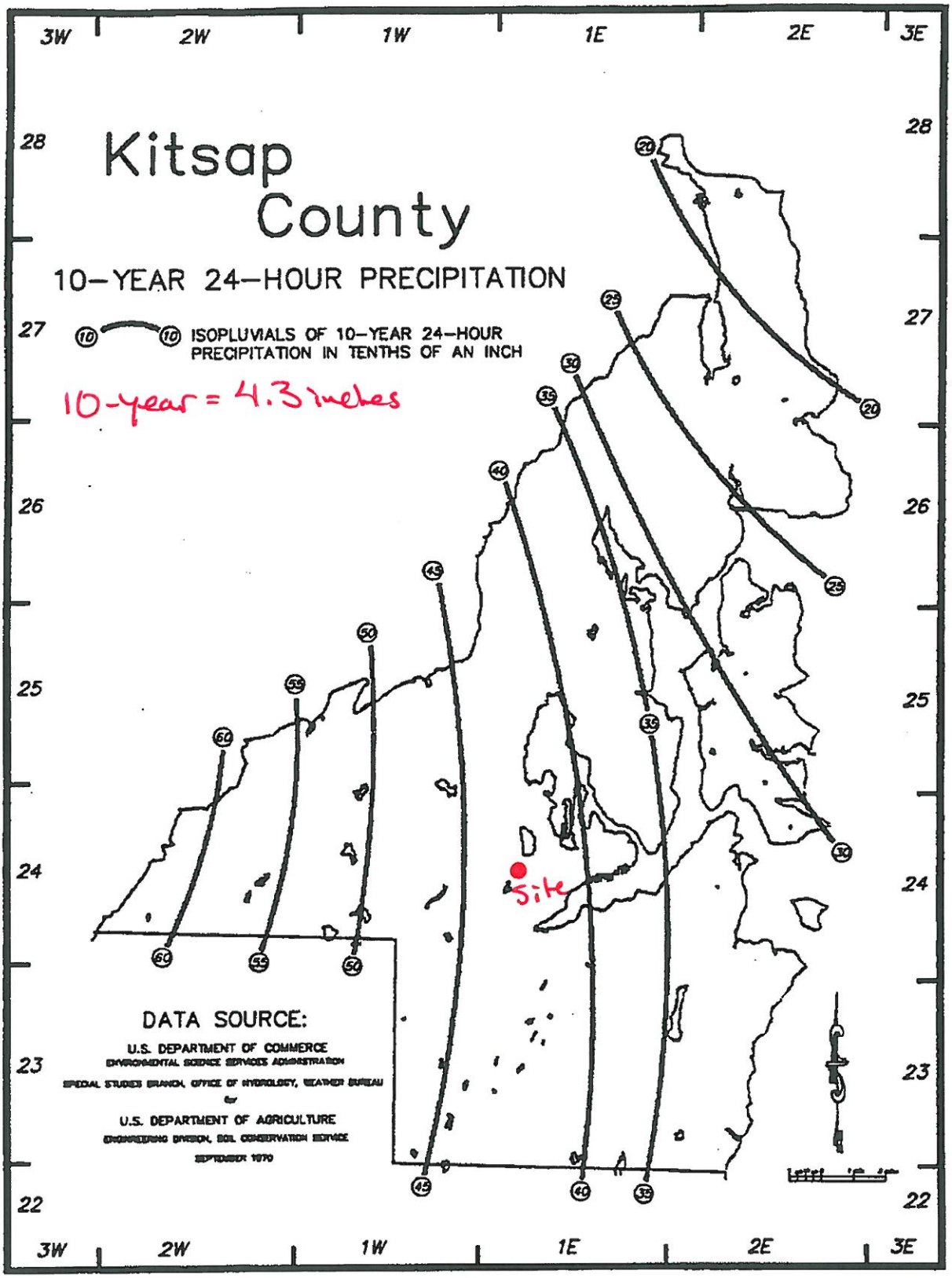


Figure 5-5 ISOPLUVIAL MAP - 50 YEAR

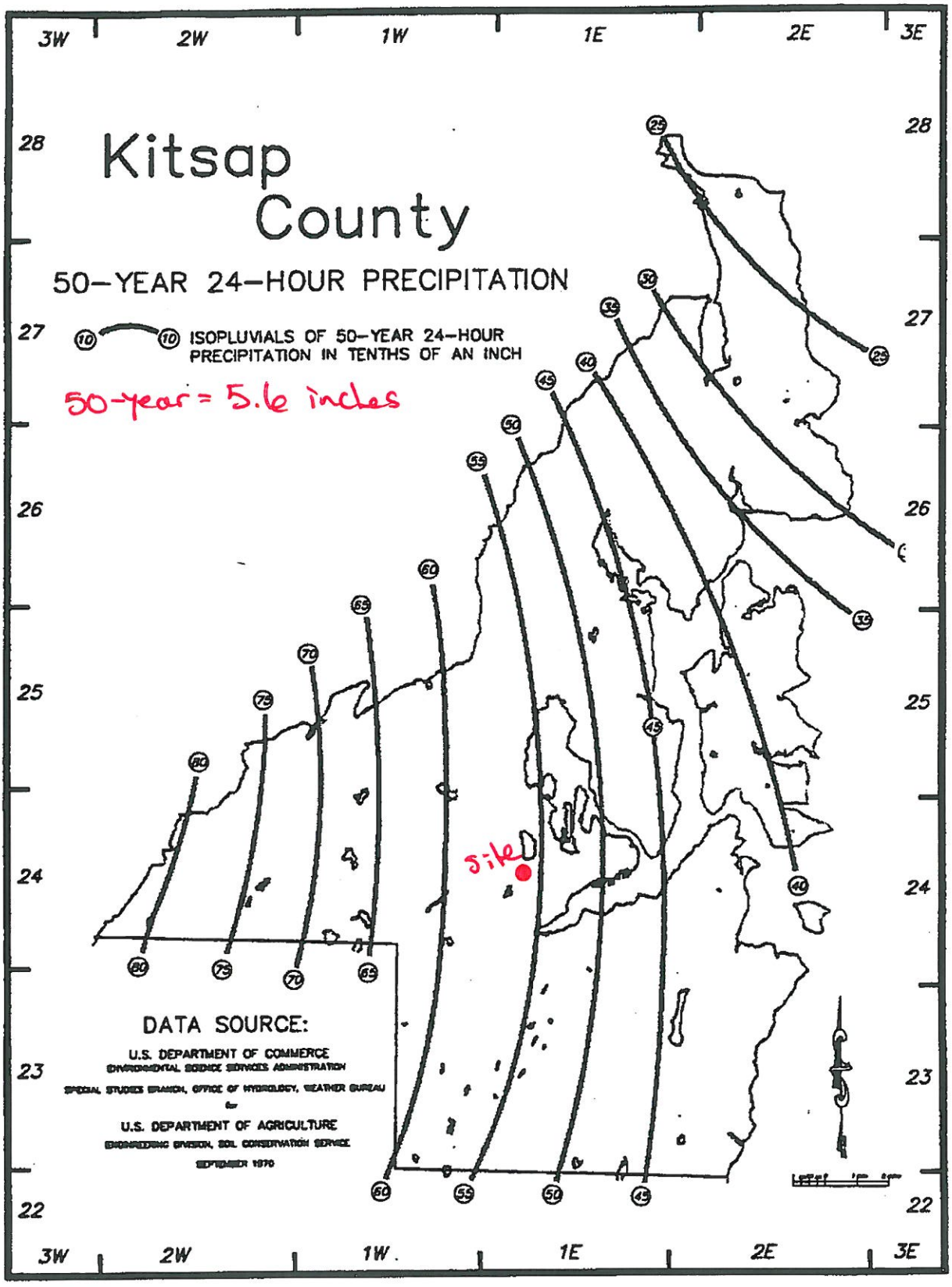
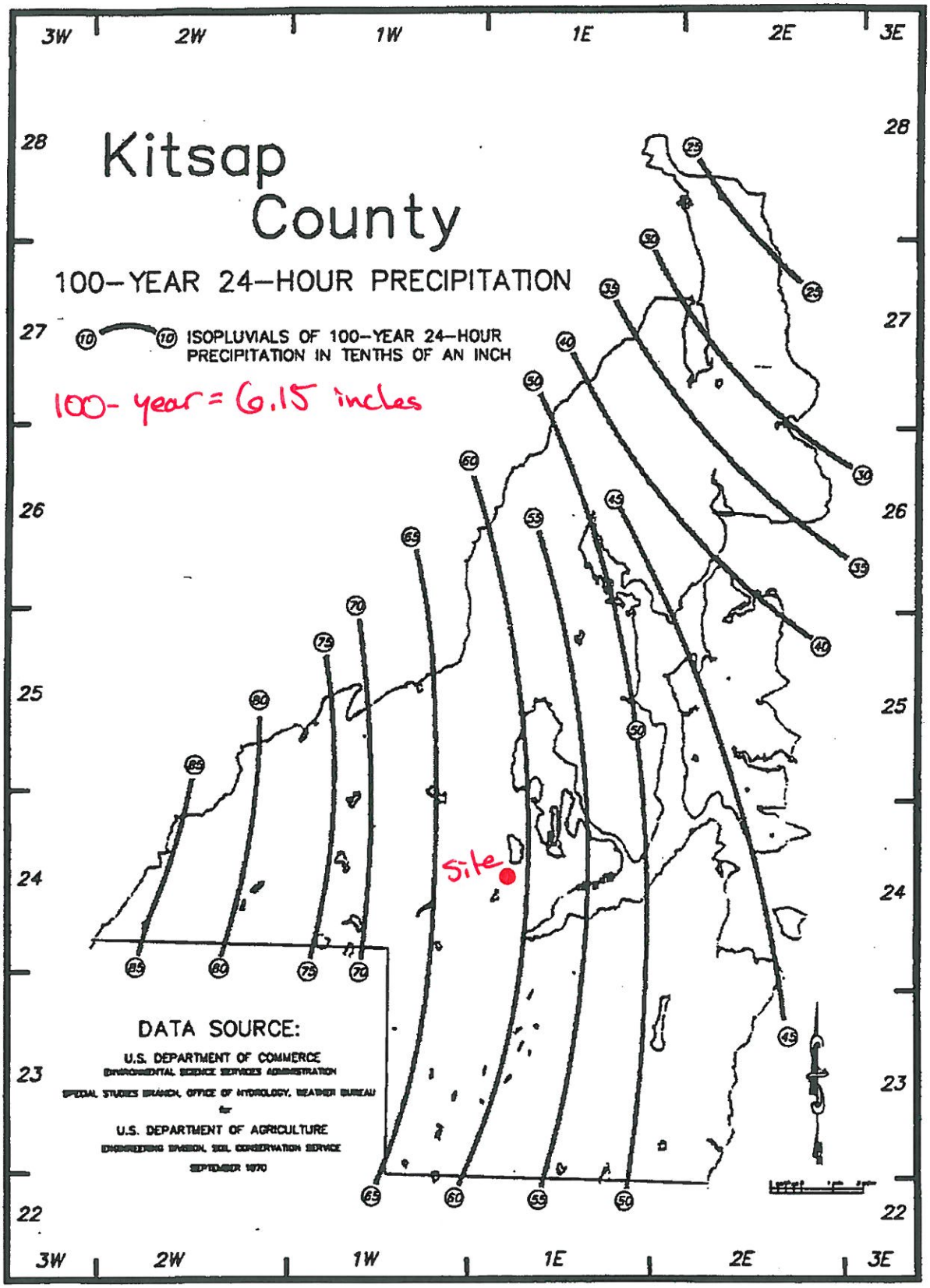


Figure 5-6 ISOPLUVIAL MAP - 100 YEAR



GRAPHIC SCALE
0 200 400
1 INCH = 400 FEET (11"x17")

LEGEND

BASIN A	517,761 SF	(11.89 AC)
BASIN B	556,092 SF	(12.77 AC)
BASIN C	274,180 SF	(6.29 AC)
BASIN D	1,471,385 SF	(33.77 AC)
BASIN E	650,183 SF	(14.93 AC)
BASIN F	152,798 SF	(3.51 AC)

EXISTING HAUL ROAD

SHEET
L=300', S=10%

SHALLOW
L=255', S=49%

CHANNEL
L=1,866', S=9%

CULVERT E & F

CHANNEL
L=2,756', S=9%

CULVERT C

CULVERT B

CULVERT A

SHEET
L=300', S=16%

SHALLOW
L=78', S=53%

CULVERT D

NEW HAUL ROAD

CHANNEL
L=1,568', S=16%

CHANNEL
L=1,027', S=14%

SHALLOW
L=467', S=23%

CHANNEL
L=507', S=3%

SHEET
L=200', S=21%

CHANNEL
L=1,148', S=14%

SHEET FLOW
L=300', S=22%

SHEET FLOW
L=300', S=49%

CONTOUR ENGINEERING, LLC
CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourpllc.com

TIME OF CONCENTRATION EXHIBIT

UELAND TREE FARM
KITSAP COUNTY, WA

BY:	K. MAUREN
PROJECT:	13-094
DATE:	5.23.14
EXHIBIT NO.	6

Appended on: 20:57:21 Wednesday, March 19, 2014

BASIN A Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
2 year	1.2874	8.75	1.0730	11.8900	SBUH	TYPE1A
5 year	2.1102	8.50	1.5722	11.8900	SBUH	TYPE1A
10 year	2.7657	8.50	1.9533	11.8900	SBUH	TYPE1A
25 year	4.0468	8.25	2.6764	11.8900	SBUH	TYPE1A
50 year	4.6583	8.25	3.0098	11.8900	SBUH	TYPE1A
100 year	5.5223	8.25	3.4777	11.8900	SBUH	TYPE1A

Record Id: BASIN A

Design Method	SBUH	**Rainfall type**	TYPE1A
Hyd Intv	15.00 min	**Peaking Factor**	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	11.89 ac	**DCIA**	0.00 ac
Pervious CN	76.00	**DC CN**	0.00
Pervious TC	49.09 min	**DC TC**	0.00 min

Pervious CN Calc

Description	SubArea	Sub cn
Wood/forest land (Undisturbed/2nd growth)	11.89 ac	76.00
Pervious Composited CN (AMC 2)		76.00

Pervious TC Calc

Type	Description	Length	Slope	Coeff	Misc	TT
Sheet	Woods or forest with dense underbrush.: 0.80	300.00 ft	22.00%	0.8000	3.10 in	35.06 min
Shallow	Forest w/ heavy ground litter & meadows (n=0.10)	467.00 ft	23.00%	0.1000		5.06 min
Channel (interm)	Forested swale w/ heavy ground litter (n=0.10)	1027.00 ft	14.00%	0.1000		8.98 min
Pervious TC						49.09 min

*Basin A tributary to Culvert A

CULVERT A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.014		ADS N-12
Channel Slope	0.02000	ft/ft	min design slope
Diameter	1.50	ft	min allowed by KC
Discharge	5.52	ft³/s	100-year peak flow

Results

Normal Depth	0.66	ft	
Flow Area	0.75	ft²	
Wetted Perimeter	2.18	ft	
Hydraulic Radius	0.34	ft	
Top Width	1.49	ft	
Critical Depth	0.91	ft	← Critical Depth
Percent Full	44.0	%	
Critical Slope	0.00695	ft/ft	
Velocity	7.37	ft/s	← Exit Velocity
Velocity Head	0.84	ft	Riprap required at outlet.
Specific Energy	1.50	ft	
Froude Number	1.83		
Maximum Discharge	14.84	ft³/s	
Discharge Full	13.79	ft³/s	
Slope Full	0.00321	ft/ft	
Flow Type	SuperCritical		

GVF Input Data

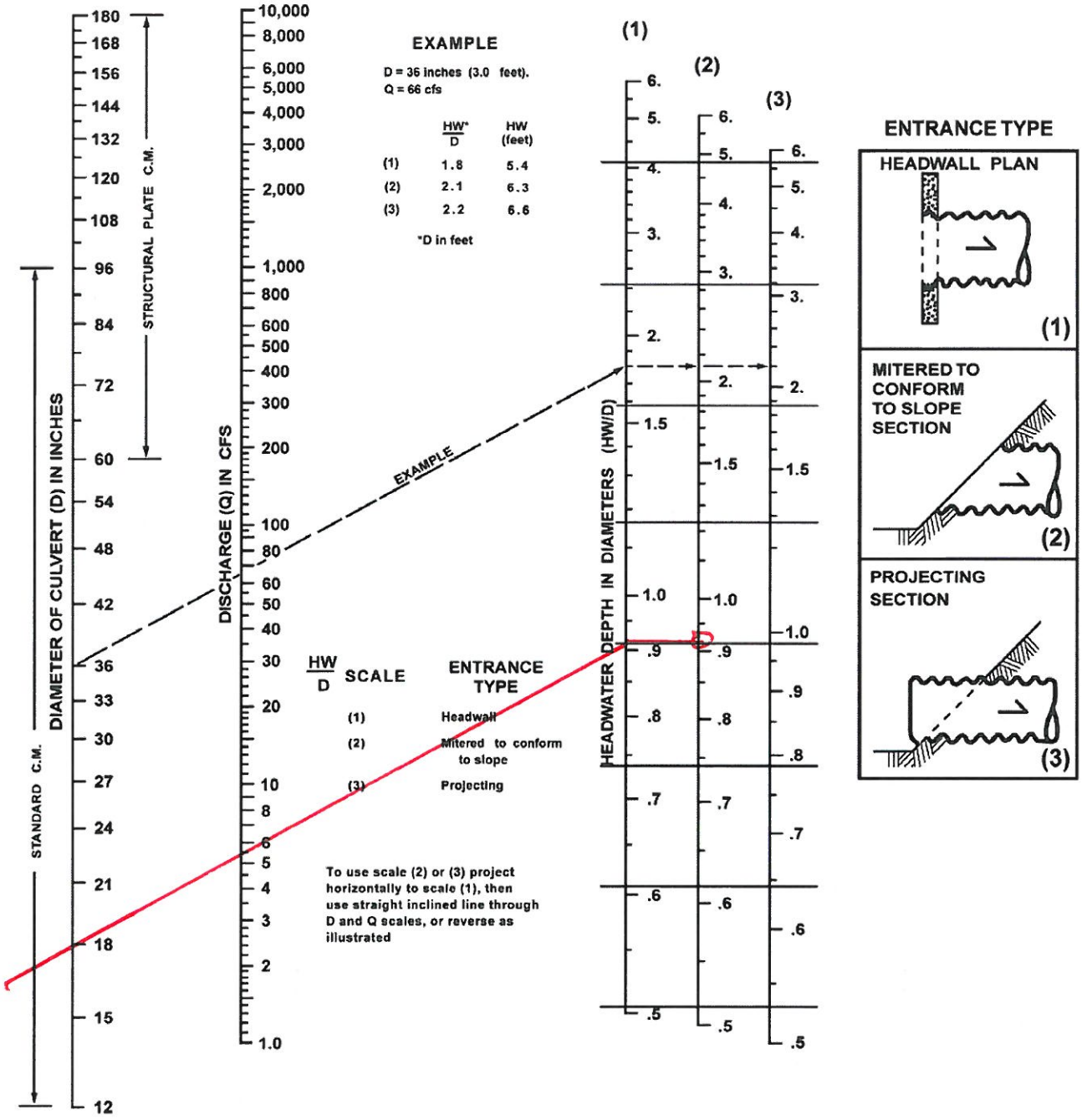
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	44.01	%
Downstream Velocity	Infinity	ft/s

Culvert A

Figure 6.18 — Headwater Depth for Corrugated Pipe Culverts with Inlet Control



$\frac{HW}{D} = \pm 0.92 < 2$ OK

Appended on: 20:57:49 Wednesday, March 19, 2014

BASIN B Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
2 year	1.6462	8.25	1.1524	12.7700	SBUH	TYPE1A
5 year	2.7541	8.25	1.6886	12.7700	SBUH	TYPE1A
10 year	3.6188	8.25	2.0978	12.7700	SBUH	TYPE1A
25 year	5.2864	8.25	2.8745	12.7700	SBUH	TYPE1A
50 year	6.0626	8.25	3.2326	12.7700	SBUH	TYPE1A
100 year	7.1565	8.25	3.7351	12.7700	SBUH	TYPE1A

Record Id: BASIN B

Design Method	SBUH	**Rainfall type**	TYPE1A
Hyd Intv	15.00 min	**Peaking Factor**	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	12.77 ac	**DCIA**	0.00 ac
Pervious CN	76.00	**DC CN**	0.00
Pervious TC	30.47 min	**DC TC**	0.00 min

Pervious CN Calc

Description	SubArea	Sub cn
Wood/forest land (Undisturbed/2nd growth)	12.77 ac	76.00
Pervious Composited CN (AMC 2)		76.00

Pervious TC Calc

Type	Description	Length	Slope	Coeff	Misc	TT
Sheet	Woods or forest with dense underbrush.: 0.80	300.00 ft	49.00%	0.8000	3.10 in	25.45 min
Channel (interm)	Forested drain crse/ravine w/defined bed (n=0.050)	1148.00 ft	14.00%	0.0500		5.02 min
Pervious TC						30.47 min

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*Basin B tributary to Culvert B

CULVERT B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.014		ADS N-12
Channel Slope	0.02000	ft/ft	Min design slope
Diameter	1.50	ft	Min allow by KC
Discharge	7.16	ft³/s	100-year peak flow

Results

Normal Depth	0.77	ft	
Flow Area	0.91	ft²	
Wetted Perimeter	2.39	ft	
Hydraulic Radius	0.38	ft	
Top Width	1.50	ft	
Critical Depth	1.04	ft	← Critical Depth (d_c)
Percent Full	51.1	%	
Critical Slope	0.00795	ft/ft	
Velocity	7.88	ft/s	← Exit Velocity
Velocity Head	0.96	ft	Riprap required at outlet.
Specific Energy	1.73	ft	
Froude Number	1.78		
Maximum Discharge	14.84	ft³/s	
Discharge Full	13.79	ft³/s	
Slope Full	0.00538	ft/ft	
Flow Type	SuperCritical		

GVF Input Data

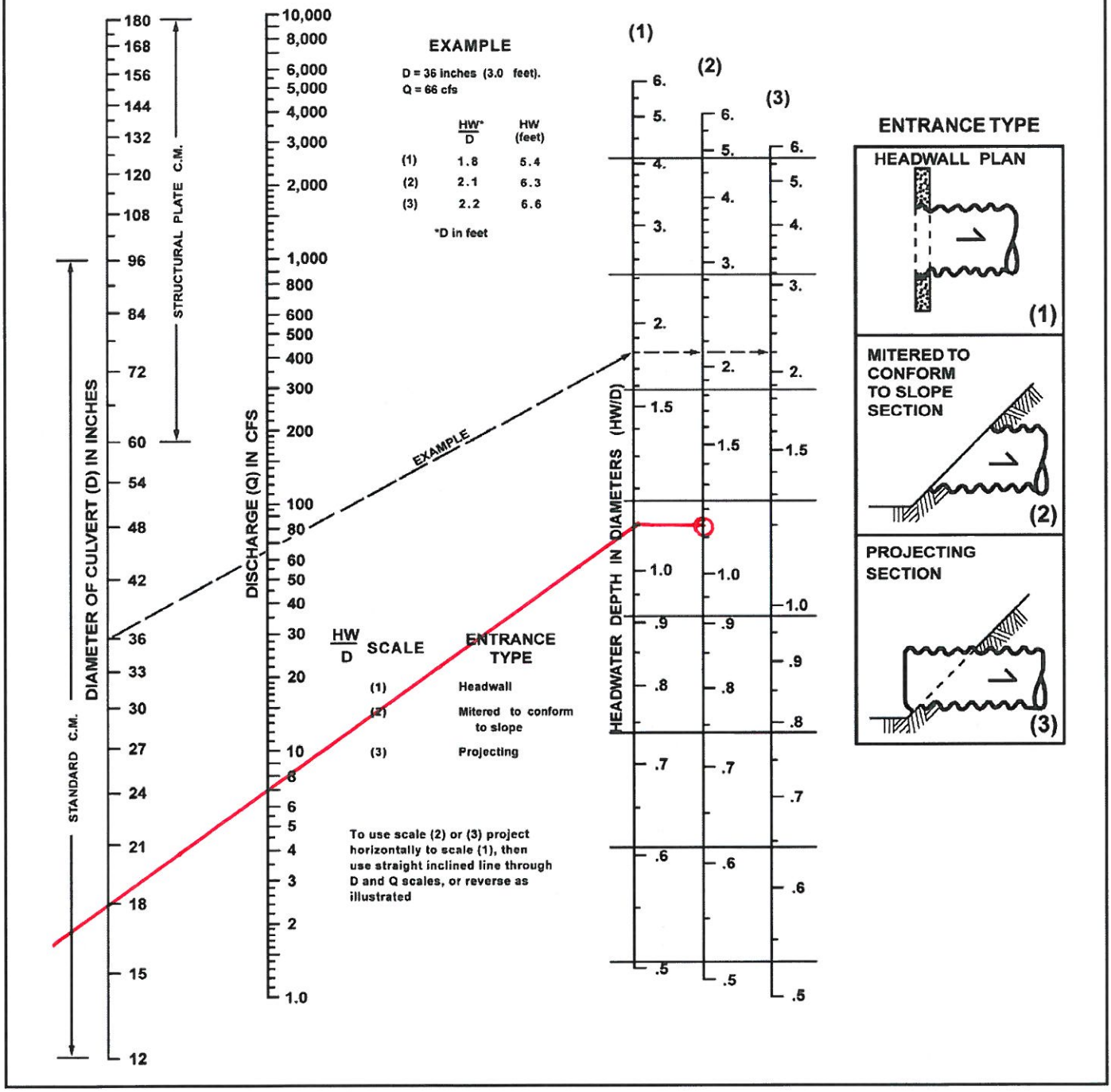
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	51.10	%
Downstream Velocity	Infinity	ft/s

Culvert B

Figure 6.18 — Headwater Depth for Corrugated Pipe Culverts with Inlet Control



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Appended on: 20:57:58 Wednesday, March 19, 2014

BASIN C Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
2 year	0.2114	17.00	0.2687	6.2900	SBUH	TYPE1A
5 year	0.4352	9.00	0.4519	6.2900	SBUH	TYPE1A
10 year	0.6704	8.75	0.6004	6.2900	SBUH	TYPE1A
25 year	1.2125	8.25	0.8972	6.2900	SBUH	TYPE1A
50 year	1.4986	8.25	1.0392	6.2900	SBUH	TYPE1A
100 year	1.9154	8.25	1.2427	6.2900	SBUH	TYPE1A

Record Id: BASIN C

Design Method	SBUH	**Rainfall type**	TYPE1A
Hyd Intv	15.00 min	**Peaking Factor**	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	6.29 ac	**DCIA**	0.00 ac
Pervious CN	64.00	**DC CN**	0.00
Pervious TC	30.61 min	**DC TC**	0.00 min

Pervious CN Calc

Description	SubArea	Sub cn
Wood/forest land (Undisturbed/2nd growth)	6.29 ac	64.00
Pervious Composited CN (AMC 2)		64.00

Pervious TC Calc

Type	Description	Length	Slope	Coeff	Misc	TT
Sheet	Woods or forest with dense underbrush.: 0.80	200.00 ft	21.00%	0.8000	3.10 in	25.82 min
Channel (interm)	Forested drain crse/ravine w/defined bed (n=0.050)	507.00 ft	3.00%	0.0500		4.79 min
Pervious TC						30.61 min

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* Basin C tributary to Culvert C

CULVERT C

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.014		ADS N-12
Channel Slope	0.02000	ft/ft	min design slope
Diameter	1.50	ft	min allowed by KC
Discharge	1.92	ft³/s	100-year peak flow

Results

Normal Depth	0.38	ft	
Flow Area	0.35	ft²	
Wetted Perimeter	1.58	ft	
Hydraulic Radius	0.22	ft	
Top Width	1.30	ft	
Critical Depth	0.52	ft	← Critical Depth (dc)
Percent Full	25.2	%	
Critical Slope	0.00572	ft/ft	
Velocity	5.49	ft/s	← Exit Velocity
Velocity Head	0.47	ft	Riprap required at
Specific Energy	0.85	ft	outlet
Froude Number	1.87		
Maximum Discharge	14.84	ft³/s	
Discharge Full	13.79	ft³/s	
Slope Full	0.00039	ft/ft	
Flow Type	SuperCritical		

GVF Input Data

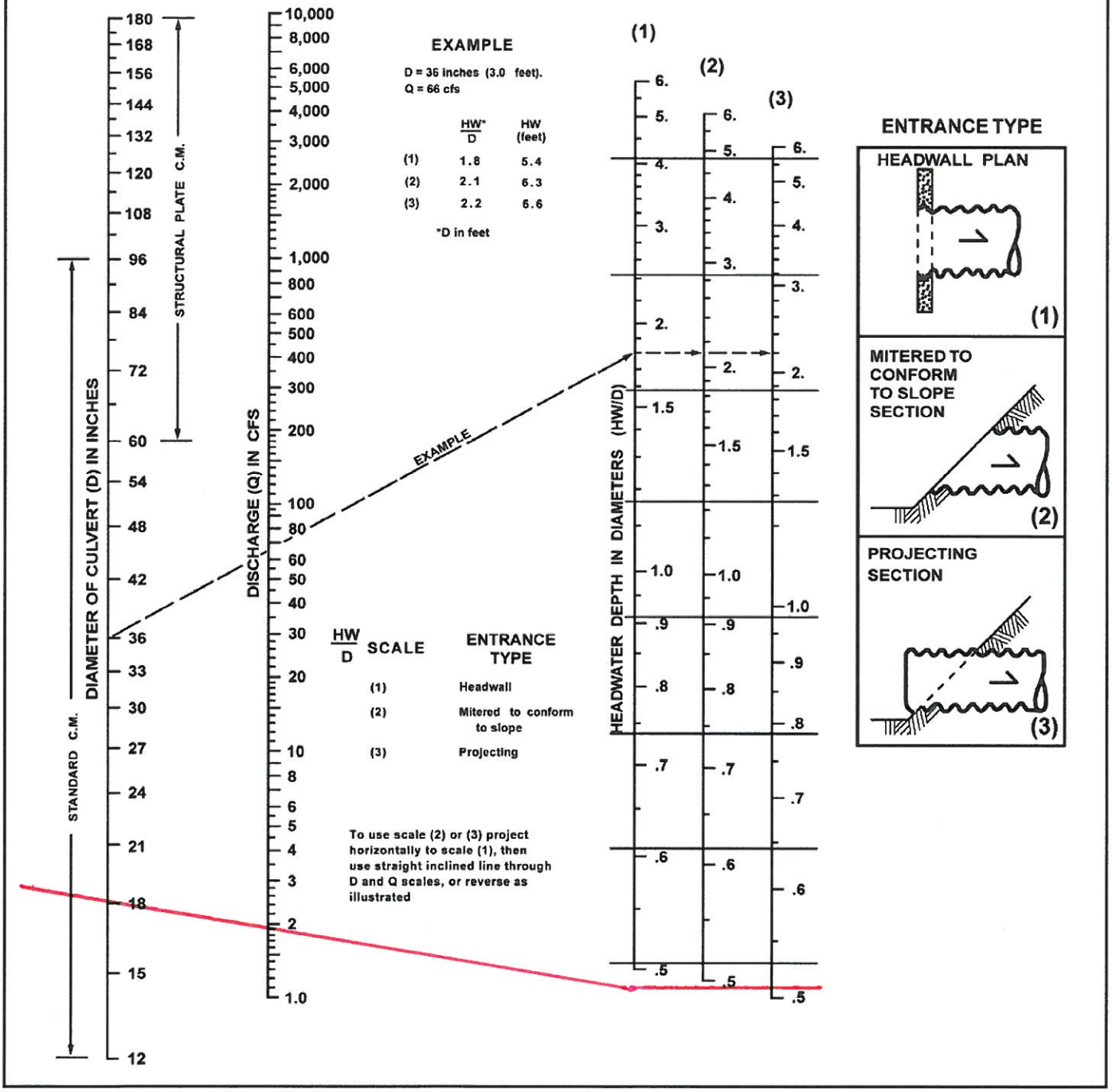
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	25.17	%
Downstream Velocity	Infinity	ft/s

Culvert C

Figure 6.18 — Headwater Depth for Corrugated Pipe Culverts with Inlet Control



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Appended on: 10:05:41 Friday, May 23, 2014

BASIN D Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
2 year	3.9578	8.75	3.2277	35.4200	SBUH	TYPE1A
5 year	6.4884	8.50	4.7217	35.4200	SBUH	TYPE1A
10 year	8.4790	8.50	5.8612	35.4200	SBUH	TYPE1A
25 year	12.4494	8.25	8.0222	35.4200	SBUH	TYPE1A
50 year	14.3134	8.25	9.0179	35.4200	SBUH	TYPE1A
100 year	16.9451	8.25	10.4149	35.4200	SBUH	TYPE1A

Record Id: BASIN D

Design Method	SBUH	**Rainfall type**	TYPE1A
Hyd Intv	15.00 min	**Peaking Factor**	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	35.42 ac	**DCIA**	0.00 ac
Pervious CN	76.19	**DC CN**	0.00
Pervious TC	46.79 min	**DC TC**	0.00 min

Pervious CN Calc

Description	SubArea	Sub cn
Wood/forest land (Undisturbed/2nd growth)	35.22 ac	76.00
Impervious surfaces (pavements, roofs, etc)	0.20 ac	98.00
Pervious Composited CN (AMC 2)		76.12

Pervious TC Calc

Type	Description	Length	Slope	Coeff	Misc	TT
Sheet	Woods or forest with dense underbrush.: 0.80	300.00 ft	16.00%	0.8000	3.10 in	39.82 min
Shallow	Forest w/ heavy ground litter & meadows (n=0.10)	78.00 ft	53.00%	0.1000		0.56 min
Channel (interm)	Forested drain crse/ravine w/defined bed (n=0.050)	1568.00 ft	16.00%	0.0500		6.41 min
Pervious TC						46.79 min

Basin D tributary to Culvert D

Culvert D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.014		ADS N-12
Channel Slope	0.02000	ft/ft	min design slope
Diameter	2.00	ft	
Discharge	16.95	ft³/s	100-year peak flow

Results

Normal Depth	1.08	ft	
Flow Area	1.73	ft²	
Wetted Perimeter	3.31	ft	
Hydraulic Radius	0.52	ft	
Top Width	1.99	ft	
Critical Depth	1.48	ft	
Percent Full	54.1	%	
Critical Slope	0.00802	ft/ft	
Velocity	9.77	ft/s	← Exit Velocity
Velocity Head	1.48	ft	Riprap required at outlet
Specific Energy	2.56	ft	
Froude Number	1.85		
Maximum Discharge	31.96	ft³/s	
Discharge Full	29.71	ft³/s	
Slope Full	0.00651	ft/ft	
Flow Type	SuperCritical		

GVF Input Data

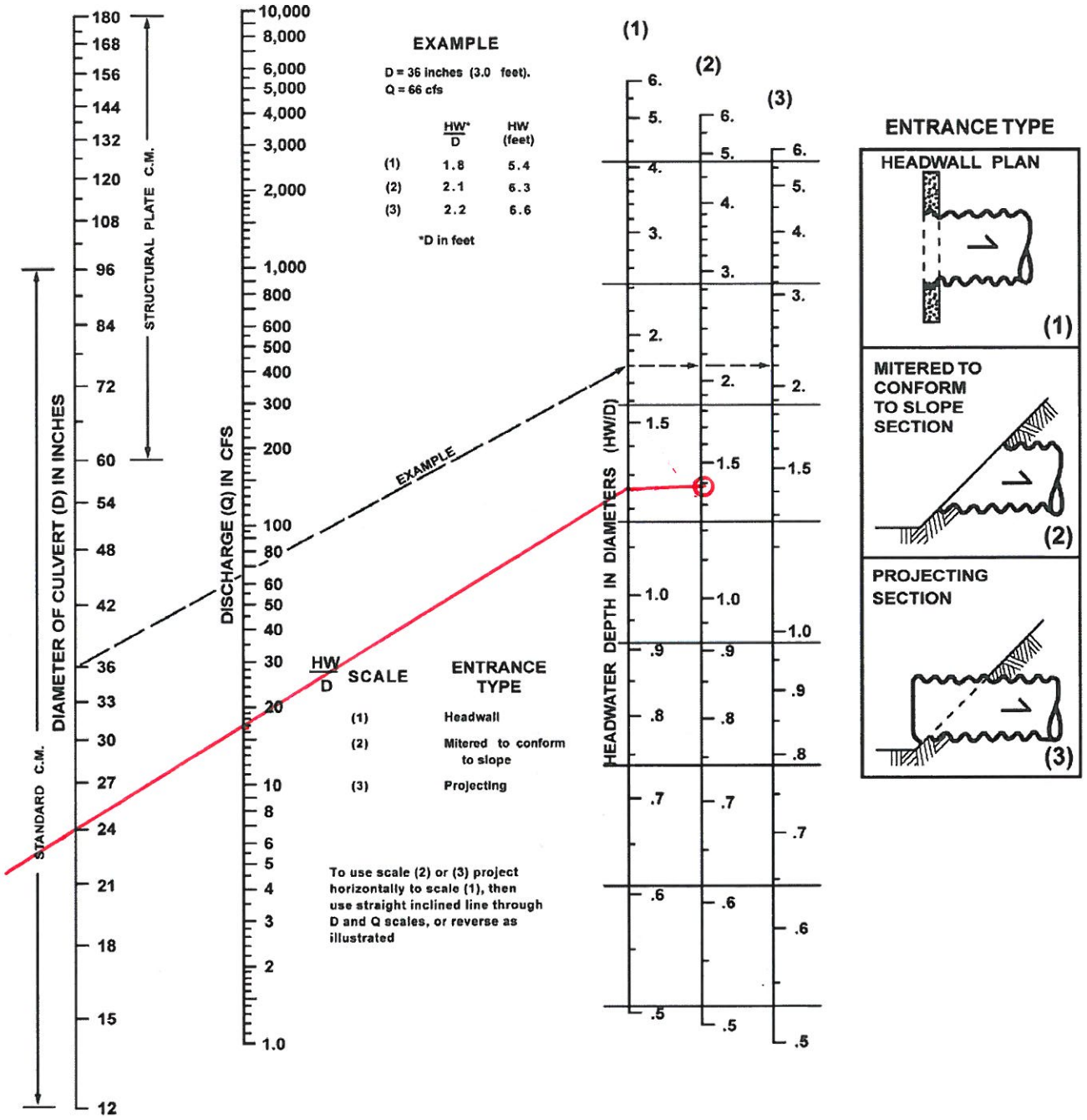
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	54.11	%
Downstream Velocity	Infinity	ft/s

Culvert D

Figure 6.18 — Headwater Depth for Corrugated Pipe Culverts with Inlet Control



$\frac{HW}{D} = \pm 1.39 < 1.5$ OK

Appended on: 10:22:26 Friday, May 23, 2014

BASIN E Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
2 year	1.9113	8.75	1.5138	14.9300	SBUH	TYPE1A
5 year	3.0156	8.50	2.1752	14.9300	SBUH	TYPE1A
10 year	3.8717	8.50	2.6751	14.9300	SBUH	TYPE1A
25 year	5.5270	8.25	3.6164	14.9300	SBUH	TYPE1A
50 year	6.3072	8.25	4.0480	14.9300	SBUH	TYPE1A
100 year	7.4038	8.25	4.6517	14.9300	SBUH	TYPE1A

Record Id: BASIN E

Design Method	SBUH	**Rainfall type**	TYPE1A
Hyd Intv	15.00 min	**Peaking Factor**	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	14.93 ac	**DCIA**	0.00 ac
Pervious CN	78.27	**DC CN**	0.00
Pervious TC	52.09 min	**DC TC**	0.00 min

Pervious CN Calc

Description	SubArea	Sub cn
Wood/forest land (Undisturbed/2nd growth)	13.88 ac	76.00
Impervious surfaces (pavements, roofs, etc)	1.05 ac	98.00
Pervious Composited CN (AMC 2)		77.55

Pervious TC Calc

Type	Description	Length	Slope	Coeff	Misc	TT
Sheet	Woods or forest with dense underbrush.: 0.80	300.00 ft	10.00%	0.8000	3.10 in	48.05 min
Shallow	Forest w/ heavy ground litter & meadows (n=0.10)	78.00 ft	49.00%	0.1000		0.58 min
Channel (cont)	Other streams, man-made channels and pipe	1866.00 ft	9.00%	0.0270		3.46 min
Pervious TC						52.09 min

Basin E tributary to Culvert E

CULVERT E

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.014		ADS N-12 (Existing)
Channel Slope	0.12200	ft/ft	(Existing slope)
Diameter	1.50	ft	(Existing Diameter)
Discharge	7.40	ft³/s	100-year peak flow

Results

Normal Depth	0.47	ft
Flow Area	0.48	ft²
Wetted Perimeter	1.79	ft
Hydraulic Radius	0.27	ft
Top Width	1.40	ft
Critical Depth	1.05	ft
Percent Full	31.7	%
Critical Slope	0.00814	ft/ft
Velocity	15.41	ft/s ← Exit Velocity, will require engineered energy disapation at outlet.
Velocity Head	3.69	ft
Specific Energy	4.17	ft
Froude Number	4.63	
Maximum Discharge	36.65	ft³/s
Discharge Full	34.07	ft³/s
Slope Full	0.00576	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	31.67	%
Downstream Velocity	Infinity	ft/s

Basin E tributary to Culvert F

CULVERT F

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.028		CMP
Channel Slope	0.10300	ft/ft	Design Slope
Diameter	1.50	ft	
Discharge	7.40	ft³/s	100-year peak flow

Results

Normal Depth	0.73	ft
Flow Area	0.85	ft²
Wetted Perimeter	2.31	ft
Hydraulic Radius	0.37	ft
Top Width	1.50	ft
Critical Depth	1.05	ft
Percent Full	48.4	%
Critical Slope	0.03254	ft/ft
Velocity	8.74	ft/s ← Exit Velocity
Velocity Head	1.19	ft
Specific Energy	1.91	ft
Froude Number	2.05	
Maximum Discharge	16.84	ft³/s
Discharge Full	15.65	ft³/s
Slope Full	0.02305	ft/ft
Flow Type	SuperCritical	

Riprap required at outlet.

GVF Input Data

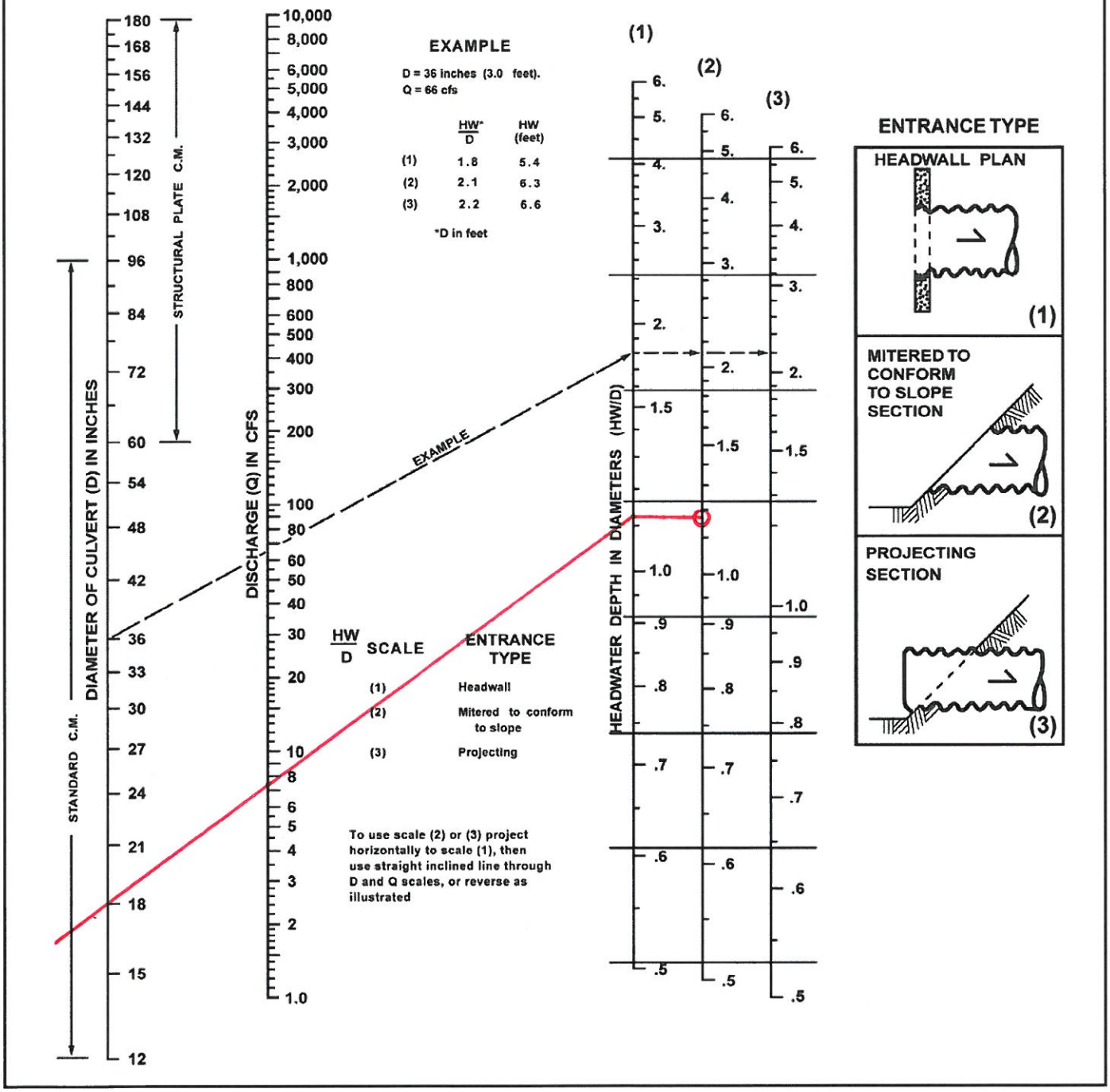
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	48.39	%
Downstream Velocity	Infinity	ft/s

Culvert E & F

Figure 6.18 — Headwater Depth for Corrugated Pipe Culverts with Inlet Control



$\frac{HW}{D} = \pm 1.18 < 2$ OK

Basin E Tributary

ROADSIDE DITCH Upstream of Culvert F

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.027	grass lined
Channel Slope	0.02000	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	1.00	ft
Discharge	7.40	ft³/s Basin E 100-yr peak flow

Results

Normal Depth	0.71	ft ← 0.79' of freeboard
Flow Area	1.72	ft²
Wetted Perimeter	4.18	ft
Hydraulic Radius	0.41	ft
Top Width	3.84	ft
Critical Depth	0.76	ft
Critical Slope	0.01528	ft/ft
Velocity	4.31	ft/s
Velocity Head	0.29	ft
Specific Energy	1.00	ft
Froude Number	1.13	
Flow Type	Supercritical	

OK

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.71	ft
Critical Depth	0.76	ft
Channel Slope	0.02000	ft/ft

Appended on: 10:44:29 Friday, May 23, 2014

BASIN E & F Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
2 year	3.8518	8.00	1.5463	14.9300	SBUH	TYPE1A
5 year	6.0279	8.00	2.2142	14.9300	SBUH	TYPE1A
10 year	7.6941	8.00	2.7184	14.9300	SBUH	TYPE1A
25 year	10.8553	8.00	3.6663	14.9300	SBUH	TYPE1A
50 year	12.3090	8.00	4.0998	14.9300	SBUH	TYPE1A
100 year	14.3432	8.00	4.7072	14.9300	SBUH	TYPE1A

Record Id: BASIN E & F

Design Method	SBUH	**Rainfall type**	TYPE1A
Hyd Intv	15.00 min	**Peaking Factor**	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	14.93 ac	**DCIA**	0.00 ac
Pervious CN	78.68	**DC CN**	0.00
Pervious TC	4.04 min	**DC TC**	0.00 min

Pervious CN Calc

Description	SubArea	Sub cn
Wood/forest land (Undisturbed/2nd growth)	16.90 ac	76.00
Impervious surfaces (pavements, roofs, etc)	1.54 ac	98.00
Pervious Composited CN (AMC 2)		77.84

Pervious TC Calc

Type	Description	Length	Slope	Coeff	Misc	TT
Sheet	Woods or forest with dense underbrush.: 0.80	300.00 ft	10.00%	0.8000	0.00 in	0.00 min
Shallow	Forest w/ heavy ground litter & meadows (n=0.10)	78.00 ft	49.00%	0.1000		0.58 min
Channel (cont)	Other streams, man-made channels and pipe	2756.00 ft	9.00%	0.0270		5.11 min
Pervious TC						53.74 min

Basin E & F Tributary

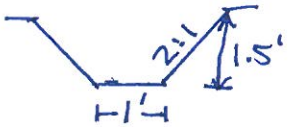
ROADSIDE DITCH Downstream of Culvert E

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.027	grass-lined
Channel Slope	0.02000	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	1.00	ft
Discharge	14.34	ft³/s combined basin E & F 100-yr peak flow



Results

Normal Depth	0.96	ft → 0.54' of freeboard OK
Flow Area	2.81	ft²
Wetted Perimeter	5.30	ft
Hydraulic Radius	0.53	ft
Top Width	4.85	ft
Critical Depth	1.04	ft
Critical Slope	0.01405	ft/ft
Velocity	5.10	ft/s
Velocity Head	0.40	ft
Specific Energy	1.37	ft
Froude Number	1.18	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.96	ft
Critical Depth	1.04	ft
Channel Slope	0.02000	ft/ft

APPENDIX D

Preliminary Water Quality Analysis

Wetpond Sizing

$f = 1.5$ (Industrial Road)
$R = 0.58$ in (see attached figure)

$$V_r = (0.9 A_i + 0.25 A_{tg} + 0.10 A_{tf} + 0.01 A_o) \times R$$

$A_i = 66,892$ SF (Impervious Area)
$A_{tg} = 0$ (Till Grass Area)
$A_{tf} = 736,089$ SF (Till Forest Area)
$A_o = 0$ (outwash Area)

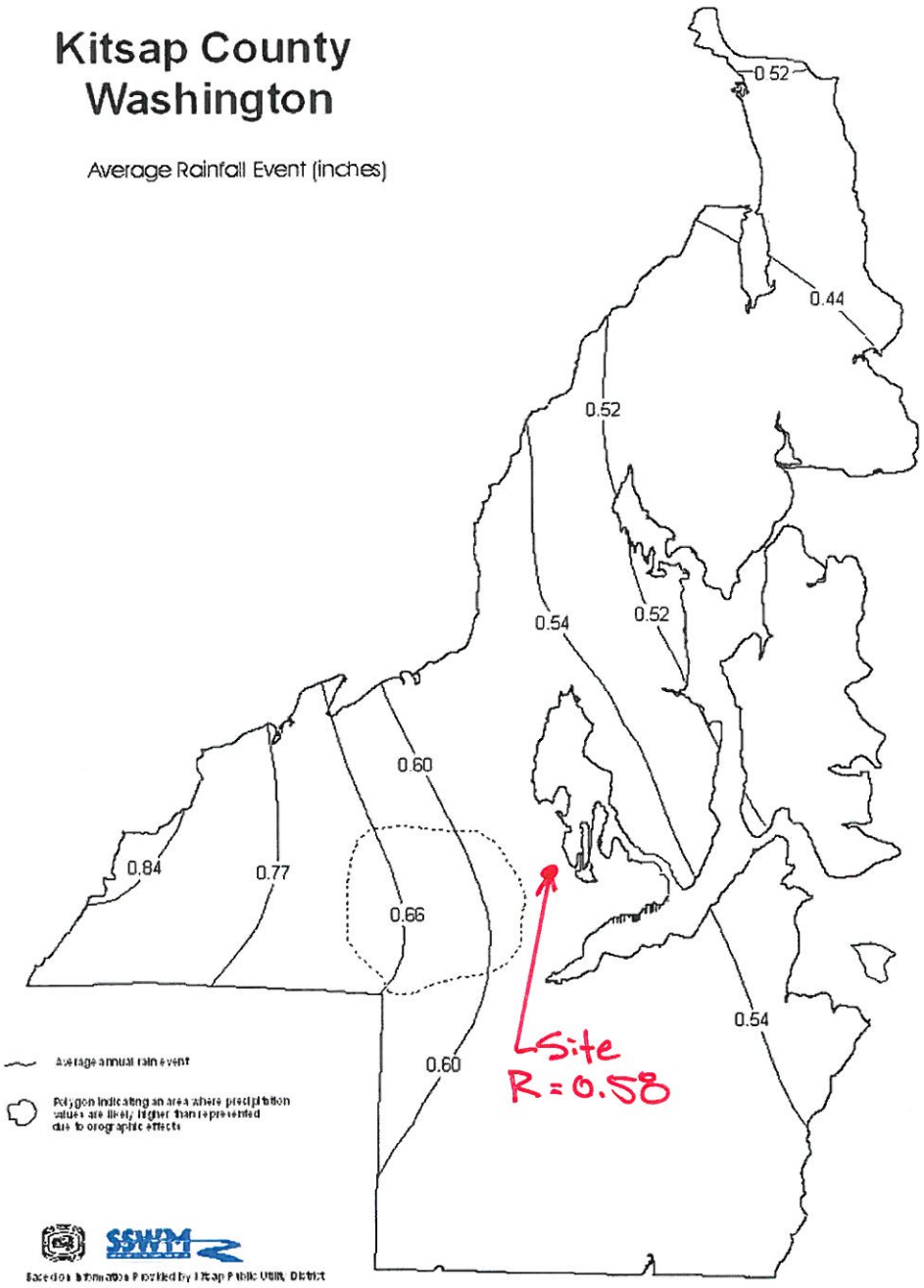
$$V_r = (0.9(66,892) + 0.25(0) + 0.10(736,089) + 0.01(0)) \times 0.048$$

$V_r = 6,423$ CF (Volume of runoff)

* Required wetpool volume,

$$V_b = f V_r$$
$$= 1.5(6423)$$
$$V_b = 9634 \text{ CF}$$

Figure 6.11 — Kitsap Mean Annual Storm



APPENDIX E

Geotechnical and Hydrogelogic Report prepared by
GeoResources, LLC

GeoResources, LLC

Ph 253-896-1011
Fx 253-896-2633

5007 Pacific Hwy. E., Suite 16
Fife, Washington 98424-2649

May 2, 2014

Ueland Tree Farm
9401 North Harborview Drive
Gig Harbor, WA 98332

Attention: Mr. Mark Mauren

Geologic and Hydrogeologic Report
Supplement
UTF - Werner Road Connector
Ueland Tree Farm Mineral Resources
Development
Kitsap County, Washington
Job: Ueland TreeFm.Supplement.RGS

INTRODUCTION

This report supplements the previous geologic and hydrogeologic portions of the Ueland Tree Farm, LLC (UTF) Mineral Resource Development reports prepared in 2006 by GeoResources, LLC and in 2009 by Parametrix, respectively. This supplement is based on amended project and site descriptions, as discussed below. Other reports, specific to the various elements of the original Mineral Resource Development documents, are available at the UTF website (Uelandtreefarm.com).

The approved "Ueland Tree Farm Mineral Resource Development Project" proposes development of commercial aggregate resources sites (both sand and gravel, and rock) on the UTF site. Under the approved development, approximately 110 acres will be developed for surface mining over about a 50-year period. This includes Gravel Mine "A" and Quarries "A", "B", and "C",

This supplement summarizes the geologic and hydrogeologic conditions in the proposed modified site area, referred to herein as the "connector". Specifically:

- Shifting of the transport route of rock and aggregate products from Northlake Way to Werner Road via a new road that extend between the Ueland Tree Farm site and Kitsap Quarry, and from there to Werner Road, the connector road.
- Moving the aggregate processing facilities from the Ueland Tree Farm site to an off-site processing facility (Kitsap Quarry); UTF therefore requests that the CUP Conditions that apply to the processing facilities at Gravel "A" be removed from the CUP.

Specifically, this supplement summarizes the geologic and hydrogeologic conditions related to the proposed UTF - Werner Road Connector to be constructed from the

southeast portion of the UTF site through the Kitsap Quarry to Werner Road. The approximate location of the Supplement Area is illustrated on the Site Vicinity Map, Figure 1. The geology and hydrogeology of the UTF and Kitsap Quarry site areas, including the east portion of the Werner Road connection, were previously provided in site specific reports. The proposed connector road alignment is illustrated on the Site Map, Figure 2.

SITE CONDITIONS

Connector Road Area - Surface Conditions

The connector road between UTF and Werner Road extends east from an established timber road situated in the east portion of the UTF site as illustrated on the Site Plan. The new connector will extend east from the existing road, traversing a steep slope area that extends down to a moderate sloping area adjacent to the railroad tracks, and then to a gently sloping to flat area in the valley floor. The connector road crosses the flatter valley floor area through the Kitsap Quarry, and then traverses a steep slope area northeast of the quarry to Werner Road.

The ground surface in the west steep slope area ranges from approximately 20 to 120 percent. This area is well vegetated with second growth timber with a dense understory. Based on our site observations and shallow hand excavations along the proposed road alignment, the shallow soils consist of intermittent sand with variable silt, gravel and cobbles, and weathered basalt bedrock. We expect that bedrock will be encountered over most of this section of the new road alignment, and that it will become more competent with depth. There may be localized areas where larger equipment (hoe-ram) may be required to excavate and remove the weathered bedrock to achieve the finished subgrades.

At the lower elevations, the valley floor area, where the road will traverse the Kitsap Quarry site, the soils generally consist of silty sand with variable gravel. This area is vegetated with scattered stands of second growth timber with dense understory with brushy/grassy fields. The lower growing vegetation is generally associated with roads, railroad access and power-line easements.

The east portion of the connector road will traverse a second steep slope area situated in the northeast portion of the Kitsap Quarry and connect to Werner Road as illustrated on the Site Plan. The east steep slope area ranges from 15 to 100 percent. The area is well vegetated with second growth timber and a dense understory.

The USDA Natural Resource Conservation Service (NRCS) Web Soil Survey for Kitsap County maps the soils in this area as Belfast loam (5), Norma fine sandy loam (37), Neilton gravelly loamy sand (36), Dystric Xerothrents (10) and Kilchis very gravelly sandy loam (26). A copy of the SCS map for the site vicinity is attached as Figure 3.

Based on our geologic reconnaissance of the proposed connector road alignment, we have observed no evidence of significant erosion or slope instability. The area is well vegetated and construction activities will be limited to the construction area.

Geologic Hazards

The Kitsap County Critical Area Ordinance (CAO) defines geologic hazardous areas as areas susceptible to erosion, sliding, earthquakes, or other geologic events such that

they are not suitable for development. Much of the west and east steep slope areas of the proposed connector road slope greater than 30 percent, and therefore meet the technical criteria of a geologic hazardous area; high erosion and landslide hazard risks based on slope inclination. We observed no evidence of significant erosion or slope instability at the times of our site reconnaissance(s), including the existing road areas above which traverse similar steep slope areas. The road alignment area is generally well vegetated and underlain by bedrock material at relatively shallow depth. Although it is possible that erosion and/or slope instability can occur during construction activities in steep slope areas, the erosion areas and/or sloughs are typically small, localized and easily repaired/stabilized as part of the road design/construction. Specific mitigation measures and long term erosion and stabilization measures are discussed below in the "**Mitigation Section**".

Project Area Geology

According to the *Geologic Map of the Wildcat Lake 7.5 Minute Quadrangle, Kitsap and Mason Counties, Washington* by Haeussler and Clark, 2000, the project site is located in an area underlain by a combination of glacial soils and bedrock. A portion of that map for the site area is included as Figure 4. Our interpretation of the stratigraphy in the proposed connector road area is based on the observed soil and rock conditions, and the materials encountered in our subsurface explorations.

The existing topography, as well as the surficial and shallow subsurface soils in the area, are the result of the most recent Vashon Stade of the Fraser Glaciation that occurred between 12,000 to 18,000 years ago, and the weathering, erosion and human activities (mineral resource extraction) that have occurred since that time. The encountered glacial soil types include glacial till, glacial recessional outwash, glacial lake sediments, and colluvium. The Vashon glacial till consists of a heterogeneous mixture of clay, silt, sand, and gravel that was deposited at the base of the prehistoric continental glacial ice mass and was subsequently over-ridden. As such, the glacial till, and the soils below the till, exhibits high strength and low compressibility characteristics. The upper portion of the glacial till has been weathered to a medium dense condition. The recessional outwash deposits that locally overlie the till consists of graded deposits of sand and gravel that were deposited by melt water streams and rivers emanating from the retreating glacial ice mass. The glacial lake sediments generally consist of localized deposits of silt and fine sand. The colluvial soils typically consist of a mixture of the upslope soils that have been weathered and deposited on the lower slope and valley floor areas.

Bedrock soils in the connector road area occur at shallow depths below the intermittent glacial soils, and are locally exposed as outcrops of weathered rock. The primary types of bedrock mapped and observed in the connector road area include massive aerial basalt flows of the Crescent Formation (Tcb) and Submarine basalt flows and volcanoclastic rocks (Tcbs). The bedrock materials in the connector road area are middle Eocene age (46 to 50 million years ago). The younger and overlying massive basalt flows (Tcb) that occur in the area can reach more than 180-meters in thickness while the older submarine complex (Tcbs) typically consists of basalt interbedded with sandstones, siltstones, tuffs, and breccias. According to Haeussler and others, (2000), aeromagnetic and gravity data over the Green and Gold Mountain areas, indicate that highly magnetic and dense rocks are located within a few kilometers of the surface, inferring that a deeper ultramafic rock complex may be present at depth. In the connector road area, the near surface materials were observed to consist of thin intermittent glacial soils over shallow weathered basalts. More detailed descriptions of

the geologic conditions are included in the previous Preliminary Geologic Report (GeoResources, LLC) and the Hydrogeologic Report (Parametrix).

Project Area Hydrogeology

Our interpretation of the hydrogeologic conditions in the site area are based on our review of the available hydrogeologic publications and maps, water well records in the site and surrounding area, and our past experience and subsurface explorations throughout the site and surrounding area. Hydrogeologic conditions for the UTF and Kitsap Quarry areas were previously discussed in the GeoResources and Parametrix reports. This supplement specifically discusses the hydrogeologic conditions in the area of the proposed connector road between the UTF site and Kitsap Quarry.

In general, the regional groundwater aquifer in the proposed connector road area consists of a localized semi-confined aquifer in the valley area, generally between 40 and 60 feet below the ground surface. The groundwater occurs within the advance outwash sands situated in the valley area. The Kitsap quarry mine and proposed new road alignment areas area located above this area.

In the upland areas to the east and west of the valley, the steep slope areas, the groundwater is much deeper and in a confined condition. Groundwater flow in the bedrock areas is limited by the nature of the material. No groundwater seepage was observed in the slope areas or encountered in our hand auger or test pit explorations in this area.

Surface water collects into a series of ponds located in the north center of the site. These ponds are identified as wetland areas. No disturbance of these areas is proposed. Surface water from the road surface will be treated and managed in accordance with the current regulations.

The project site is located within a Critical Aquifer Recharge area identified by Kitsap County. The recharge in this area occurs as surface runoff and shallow subsurface flow in the upper bedrock areas that moves down into the valley area. The water recharges the existing pond/wetland system that occurs north of the proposed road and existing mine area. These perched ponds and wetlands overflow north towards the lake, but this water also move as shallow subsurface flow towards the lake. It is likely that some minor of recharge to the deeper aquifer occurs through the underlying aquitard or restrictive layer that perches the water in the site area. It is also likely that once the water reaches the lake, more significant recharge occurs, thus the designation of the area as a Critical Aquifer Recharge area.

POTENTIAL IMPACTS and MITIGATION

Geologic Hazards

Much of the west and east portions of the proposed connector road alignment are situated in areas of steep slope, greater than 30 percent. As indicated, these areas meet the technical criteria of geologic hazardous areas; high erosion and landslide hazards. The road alignment area are well vegetated and underlain at relatively shallow depth by very dense bedrock materials. These areas were previously timber harvested, with no recorded erosion or slope stability issues. We observed no evidence of significant erosion or slope instability at the times of our multiple site reconnaissance(s).

The greatest risk of erosion and/or slope instability in this area will likely occur during road construction activities in the steeper slope areas, such as the areas along the proposed connector road alignment. These areas of potential erosion or failure are typically small, localized and repaired/stabilized as part of the road design/construction process. These process can be mitigated during construction, and after, through the use of conventional drainage and erosion control measures utilized throughout the Puget Sound area. No evidence of significant erosion or slope instability was observed in the areas of existing road alignment that traverse the Ueland site, many of which cross steep slope areas.

The Puget Sound area is identified as a Seismic Risk Zone 3 in the Seismic Zone Map of the United States contained in the 2012 IBC (International Building Code). Based on the subsurface conditions observed in the majority of the site, specifically the new road alignment/extension areas, we interpret the site conditions to correspond to a seismic Soil Profile type S_B, for Dense Rock and Soil Profile type S_C for Very Dense Soil, as defined by Table 16-J (UBC) and Site Class "C" in accordance with Table 1615.1.1 in the 2012 IBC documents. This is based on the inferred range of SPT (Standard Penetration Test) blow counts relative to progress of the exploration equipment and probing with a ½-inch diameter steel probe rod. The shallow soil conditions were assumed to be representative for the site conditions beyond the depths explored. Based on the subsurface conditions observed in the lower portion of the site, we interpret the native site soil conditions in this area to correspond to a seismic Soil Profile type S_E, for Soft Soil, as defined by Table 16-J (UBC), or as Site Class "E" in the 2003 IBC. In addition, the perched water table in this area increases the potential for seismic induced liquefaction

Erosion Hazard Mitigation Measures

Based on the soils observed in the steep slope areas of the site, the site is underlain by a variable thickness of weathered soil material consisting of silty sand with variable gravel and bedrock. As vegetation is removed from these, and even the flatter areas, the potential for erosion will increase significantly. Although the erosion hazard for the granular and bedrock soils is lower than soils with higher silt content, the erosion risk can still be significant depending on the steepness of the slope.

Erosion mitigation measures can be divided into (1) preventing erosion, (2) managing erosion surfaces, and (3) managing contaminated water. It is typically easier and less expensive to prevent erosion. Temporary and permanent erosion control measures should be installed and maintained during and after construction activities to limit the additional influx of water to exposed areas. Runoff water flow should be managed to the extent possible. Temporary ponds or holding cells may be utilized as a final mitigation. This will protect the storm ponds, creeks and wetland areas - all receiving waters. Mitigation measures to reduce the risk of erosion at the site during and after construction will include the following:

- Limit the removal of vegetation to the active construction area.
- Graded areas should be shaped to avoid concentrations of runoff water onto cut or fill slopes, natural slopes or other erosion-sensitive areas.
- Silt fences should be used where appropriate.
- Erosion control measures should include, but not be limited to surficial coverings

such as straw mulch, hog fuel, mattings, geotextile fabrics, crushed rock or visqueen (if necessary).

- Where feasible, collect and/or direct runoff water; ie. swales with check dams.
- Install soil/gravel/rock or waddle berms to eliminate free flow of water.
- Once grading is complete, final ground cover/protection should be used in exposed or disturbed areas; ground cover/protection may include hydro-seeding, long term mulches, jute matting, excelsior matting, wood chips hog fuel, or crushed rock. Permanent erosion protection should be installed as soon as appropriate.

Landslide Hazard Mitigation Measures

As previously discussed, the site and surrounding area have been previously harvested for timber. Based on our data review, no significant erosion or landslide activity was reported or documented during or following the previous harvest. In addition, no evidence of significant erosion or slope instability was observed in the existing road areas that traverse the site. Although the proposed connector road construction will require significant earthwork to reach the design grades, it will be similar to the existing roads at the site. In addition, the existing quarry slopes provide historic evidence of the stability of the bedrock material in near vertical conditions. As with erosion, the increased risk of slope instability will occur during the active construction activity. The risk of slope instability can be mitigated with the following;

- Limit the amount of open grading or cut slopes.
- Minimize the removal of vegetation to the active construction area.
- Where possible, leave the stumps in place to minimize the amount of upslope ground disturbance.
- Minimize disturbance of the undergrowth.
- Construct interceptor berms, dikes and/or shallow drainage swales to intercept surface water flow and route the flow away from the cleared/graded areas to a stabilized and approved point of controlled discharge.
- Install collector drains in significant seepage areas.
- Install a berm with collector drain above the slope to prevent uncontrolled runoff from above (only in areas where slopes towards cut slope).
- No side casting of soil/fill material on lower slope areas.
- Stormwater management should include the use of ground cover, ditches/swales, berms, check dams, as described above in erosion hazard section.
- Site specific recommendations will be provided at the time of construction by geotechnical professionals.
- The contractor should perform daily site review and maintenance of all erosion and sedimentation control measures at the site to ensure their proper working order.

No change in the risk of erosion or slope instability is expected at the site or the adjacent areas if appropriate mitigation measures are utilized. Best Management Practices (BMPs) as described in the 2010 Kitsap County Stormwater Manual for construction sites and continued monitoring during and after construction should protect the site and surrounding areas from unwanted erosion or slope instability.

Seismic Mitigation Measures

Based on the soil conditions encountered within the proposed road alignment, two distinct seismic risk zones occur at the site; the sloping upper bedrock areas, and the valley floor

area. It is our opinion that the areas of the site underlain by bedrock have a low risk factor related to seismic activity. The lower portion of the site is underlain by more granular soils and perched water. This area does have a higher risk of seismic induced liquefaction.

Liquefaction is a temporary loss of shear strength in a saturated soil mass subjected to cyclical shaking. Ground shaking of sufficient magnitude and duration must occur to induce liquefaction of the soil. The effects of liquefaction may be manifested by sand boils, lateral spreading, slope failures, or seismically induced aerial settlement. Because of the grades in this portion of the site, it is our opinion that the risk of sand boils, lateral spreading, or aerial settlement is possible. However, this risk can be mitigated through proper road design and construction. Typically, the road subgrade section is thickened or geotextile fabric can be utilized to construct a "bridge" section that is not affected by the potential liquefaction of the underlying or adjacent material.

Hydrogeologic Mitigation Measures

Potential Hydrogeologic impacts at this site are related to construction activities during precipitation events. The resultant surface water runoff results in risk of erosion, slope instability and surface/groundwater turbidity transport. In addition, during construction there is an increased risk of a potential contaminant release from equipment. There have been no reported issues associated with historic mine activity at the Kitsap site. All construction activities will be conducted in accordance with the approved plans and project specifications, "Best Management Practices", County codes and Washington State regulations. Water quality will be monitored during by certified individuals during and following construction, until the permanent erosion control measures are established. Results of the monitoring will be available to the county, and submitted to WDOE.

Although there will be an increase in the amount of runoff in the road area, that runoff will be directed to stormwater management systems that will ultimately allow a portion of the runoff to infiltrate and the remaining water to continue to recharge the shallow subsurface soils and wetland areas to the north. Because the recharge of the shallow water systems will not be changed significantly, the potential recharge of the deeper aquifer will not be adversely affected. Recharge to the deeper aquifers occurs by infiltration of rainfall through the shallow soils, the overlying aquifers and aquitards, and laterally from up gradient sources. It should be noted that the recharge area for the deeper aquifers in this area, essentially occurs over the entire east and west upland areas. This site comprises less than 0.01 percent of that total recharge area.

Any seasonal perched ground water that exists locally is potentially susceptible to surface contamination, but based on well records in the site area, this near surface water is not used as a potable water supply source in the site area. The site activities will be closely monitored and spill prevention plans and kits will be kept on-site at all times. All site activities will be conducted in accordance with "Best Management Practices", County codes and Washington State regulations. The deeper aquifers are protected from possible contamination by the filtering effect of the overlying sand and gravel and fine-grained silt and clay deposits, as well as the bedrock, that occur in the site area.

◆ ◆ ◆

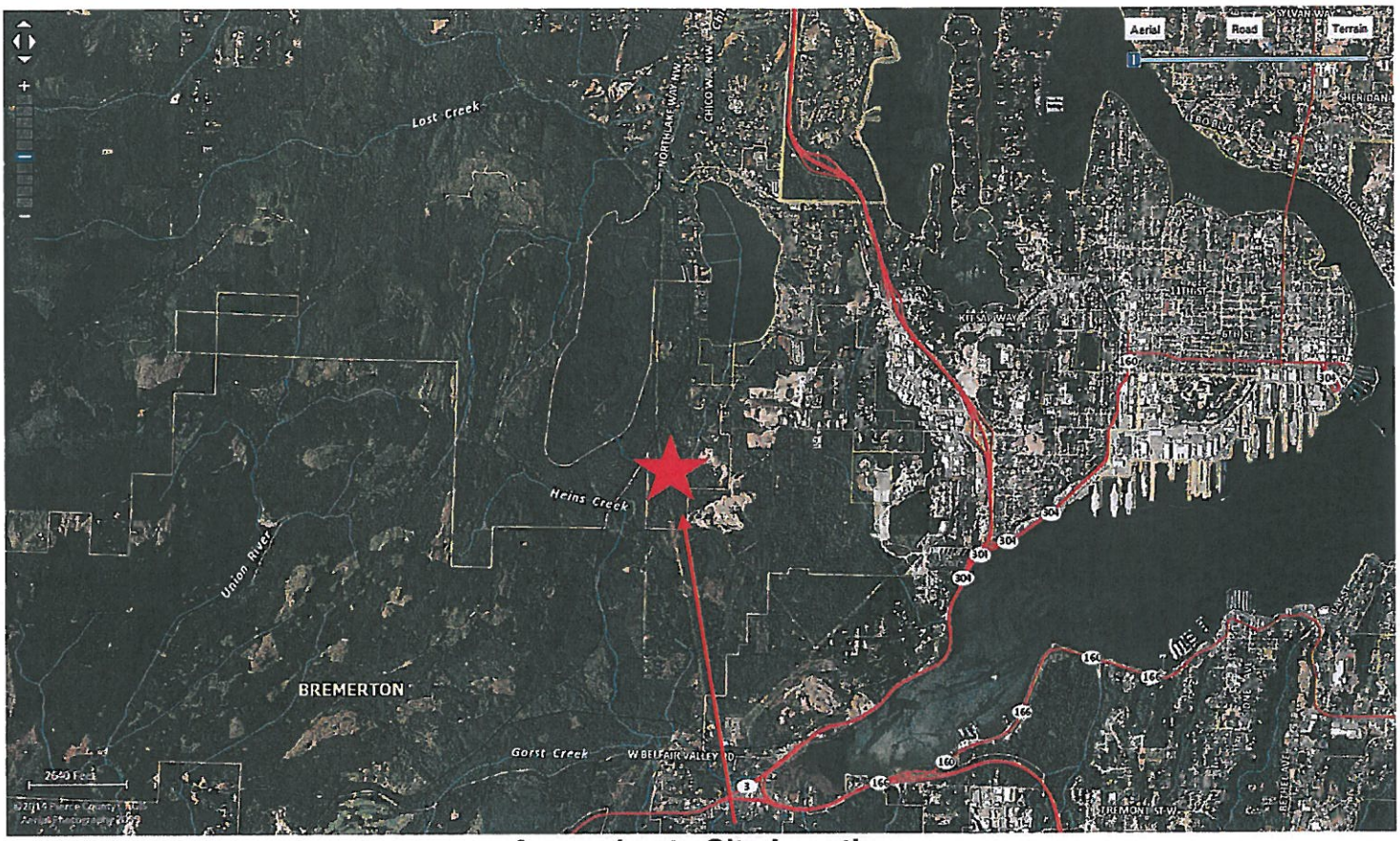
We appreciate the opportunity to be of continued service to you on this project and trust that this will meet the Department of Natural Resources request for a written narrative of the project.

Yours very truly,
GeoResources, LLC

Dana C. Biggerstaff, PE
Sr. Geotechnical Engineer

Brad P. Biggerstaff, LHG
Principal

BPB:DCB:bpb
Do.ID: UelandTreeFarm.ConnectorRd.GRS
Attachments: Figure 1: Project Vicinity Map
Figure 2: Project Site Map
Figure 3: Project Area NRCS - SCS Soil Map
Figure 4: Project Area Geologic Map



Approximate Site Location

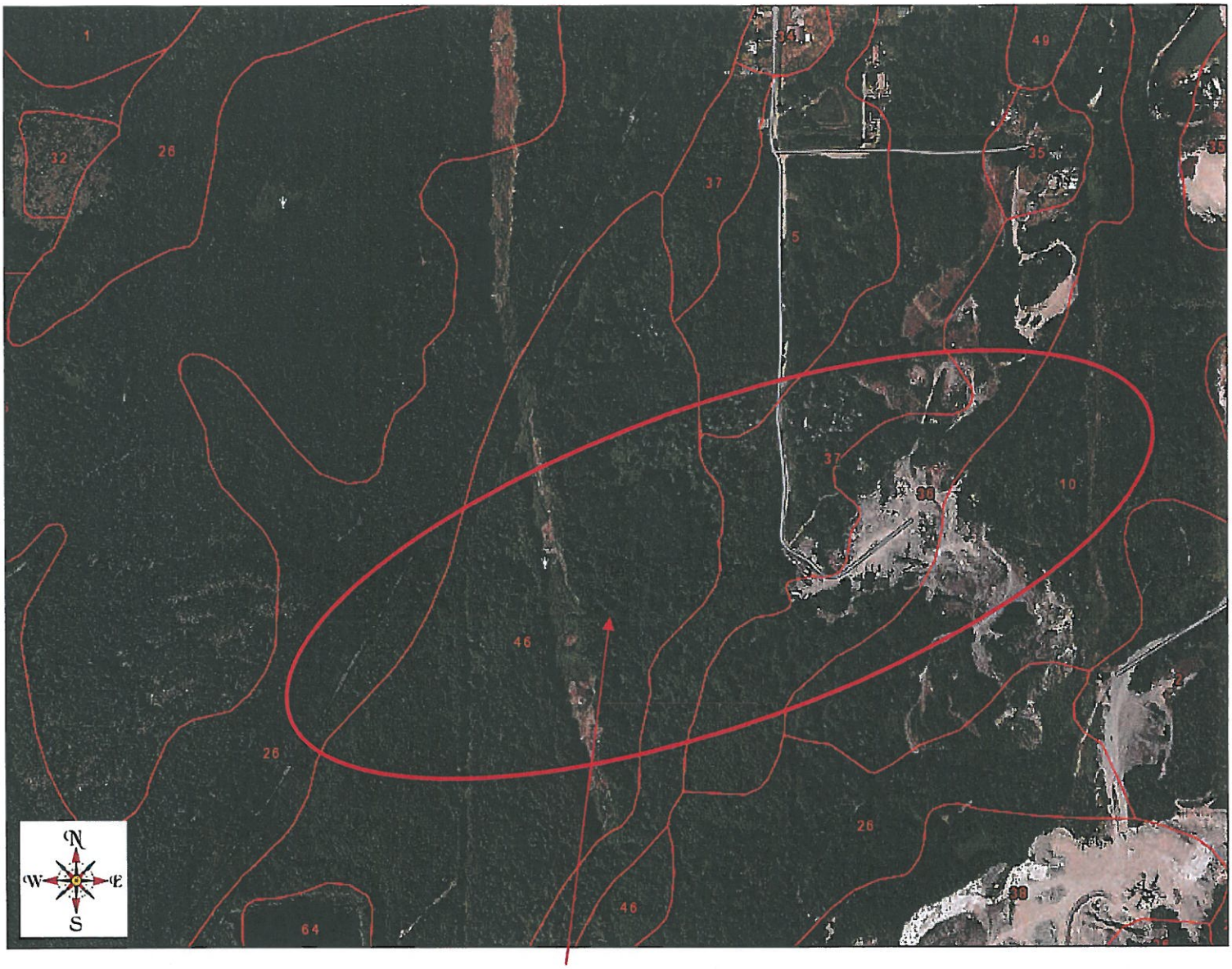
N
W E
S

Not to Scale

GeoResources, LLC
5007 Pacific Highway East, Suite 16
Fife, Washington 98424
Phone: 253-896-1011
Fax: 253-896-2633

Site Location Map
Proposed Road
Kitsap Quarry
Bremerton, Washington

Job: Ueland.roadextension.F	March 2014	Figure 1



Approximate Site Location

(map created from the USDA Natural Resource Conservation Service Web Soil Survey)

Soil Type	Soil Name	Parent Material	Slopes	Erosion Hazard	Hydrologic Soils Group
25	Kilchis very gravelly sandy loam	Residuum from weathered Basalt	15 to 30	Moderate to severe	D
26	Kilchis very gravelly sandy loam	Residuum from weathered Basalt	30 to 70	Severe	D
36	Neilton gravelly loamy sand	Gravelly glacial outwash deposits	15 to 30	Slight to Moderate	A
37	Norma fine sandy loam	Alluvium with volcanic ash	0 to 3	None	C/D
46	Ragnar fine sandy loam	Outwash terraces and alluvial fans	15 to 30	Moderate	A

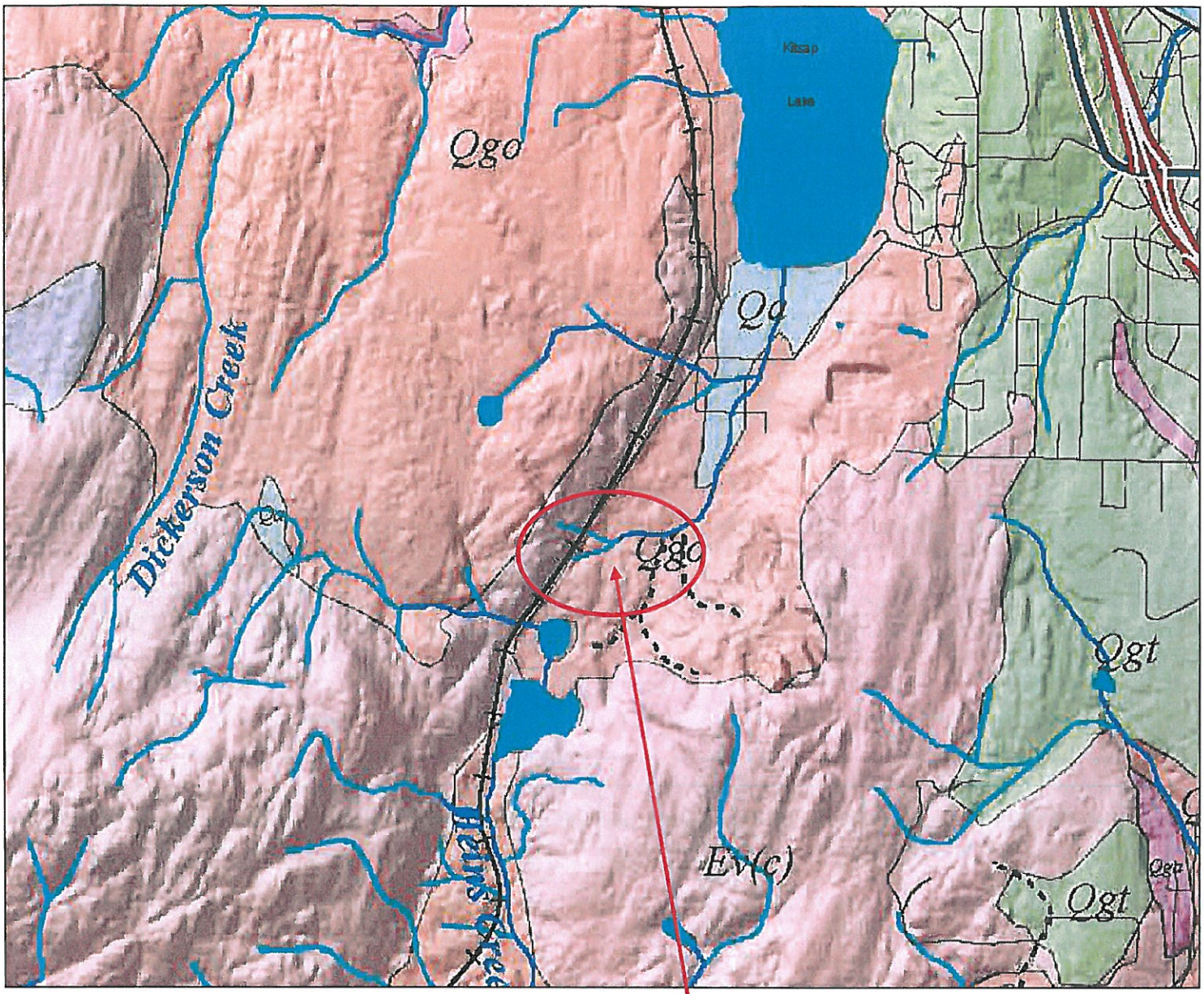
Not to Scale

GeoResources, LLC
5007 Pacific Highway East, Suite 16
Fife, Washington 98424
Phone: 253-896-1011
Fax: 253-896-2633

NRCS SCS Soils Map

Proposed Connector Road
Kitsap Quarry
Bremerton, Washington

Job: Ueland.roadextension.F	March 2014	Figure 3



Approximate Site Location

An excerpt from the *Washington State DNR Division of Geology and Earth Resources OFR 2005-3 December 2005*

Qa - Alluvium
Qga – Advance continental glacial outwash, Fraser age
Qgo - continental glacial outwash, Fraser age
Qgt - Continental Glacial Till, Fraser age
Ev(c) - Basalt flows and flow breccias, Crescent formation

Not to Scale

GeoResources, LLC
5007 Pacific Highway East, Suite 16
Fife, Washington 98424
Phone: 253-896-1011
Fax: 253-896-2633

USGS Geologic Map
Proposed Connector Road
Kitsap Quarry
Bremerton, Washington

Job: Ueland.roadextension.F	March 2014	Figure 4

APPENDIX D

Preliminary Water Quality Analysis

Wetpond Sizing

$S = 1.5$ (Industrial Road)

$R = 0.58$ in (see attached figure)

$$V_r = (0.9 A_i + 0.25 A_{tg} + 0.10 A_{tf} + 0.01 A_o) \times R$$

$A_i = 51{,}000$ SF (Impervious Area)

$A_{tg} = 0$ (Till grass Area)

$A_{tf} = 656{,}950$ SF (Till Forest Area)

$A_o = 0$ (Outwash Area)

$$V_r = (0.9(51{,}000) + 0.25(0) + 0.10(656{,}950) + 0.01(0)) \times 0.048$$

$V_r = 5{,}356.6$ CF (Volume of runoff)

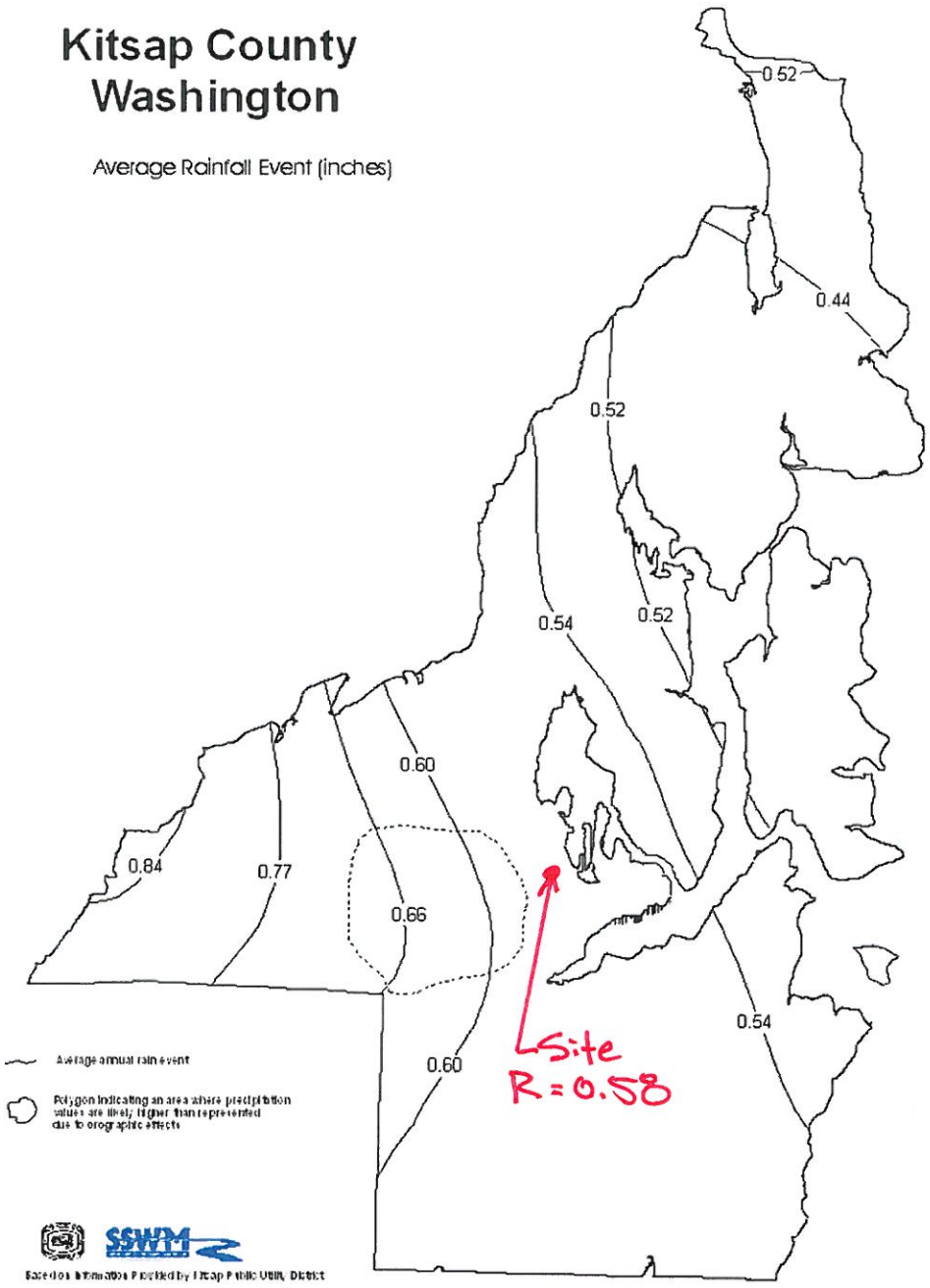
* Required Wetpool Volume,

$$V_b = S V_r$$

$$= 1.5(5{,}356.6)$$

$V_b = 8{,}035$ CF ← Required Volume

Figure 6.11 — Kitsap Mean Annual Storm



APPENDIX E

Geotechnical and Hydrogelogic Report prepared by
GeoResources, LLC

WETLAND AND FISH AND WILDLIFE HABITAT ASSESSMENT AND HABITAT MANAGEMENT PLAN

UELAND TREE FARM/KITSAP QUARRY – PRIVATE ACCESS ROUTE

APRIL 2014

Soundview Consultants LLC

WETLAND AND FISH AND WILDLIFE HABITAT ASSESSMENT AND HABITAT MANAGEMENT PLAN

UELAND TREE FARM/KITSAP QUARRY – PRIVATE ACCESS ROUTE

APRIL 29, 2014

PROJECT LOCATION

KITSAP QUARRY/UELAND TREE FARM
818 ARCHIE AVENUE WEST
BREMERTON, WASHINGTON 98321
(KITSAP COUNTY)

PREPARED FOR

UELAND TREE FARM LLC
6323 PIONEER WAY EAST
PUYALLUP, WASHINGTON 98371

PREPARED BY

SOUNDVIEW CONSULTANTS LLC
2907 HARBORVIEW DRIVE
GIG HARBOR, WASHINGTON 98335
(253) 514-8952

Soundview Consultants LLC

Executive Summary

Soundview Consultants LLC has been retained by Ueland Tree Farm LLC (Client) to complete a wetland and fish and wildlife habitat assessment and habitat management plan for a proposed private access road through portions of an approximately 135-acre project site composed of ten tax parcels. Four tax parcels are located within the City of Bremerton (Kitsap County Parcel Numbers: 192401-4-004-2004, 202401-3-005-2002, and 202401-1-019-2000). The remaining parcels are located in unincorporated Kitsap County, Washington (Kitsap County Parcel Numbers: 202401-3-002-2005, 192401-4-004-2002, 202401-2-024-2001, 202401-3-004-2003, 202401-2-012-2005, 192401-1-012-2000, and 202401-2-026-2009). These parcels are located west of Kitsap Creek where it exits Kitsap Lake in the southeast ¼ of Section 19 and the southwest ¼ of Section 20, Township 24 North, Range 01 East, W.M. The proposed project includes construction of a private 15-foot wide gravel access road from Werner Road through the existing Kitsap Quarry site to Ueland Tree Farm.

Soundview Consultants LLC investigated the subject property for wetlands, potentially regulated fish and wildlife habitat, and/or priority species in the summer and winter of 2012 and added additional areas in February of 2014. Overall, the site investigation identified eleven (11) wetlands and five (5) aquatic features in the vicinity of the subject property. The identified wetlands and aquatic features are all likely regulated by the U.S. Army Corps of Engineers (USACE), Washington State Department of Ecology (WSDOE), and locally by either Kitsap County or the City of Bremerton.

Wetlands A, B, C, and D were identified in 2012 to the east of the existing access road north of Kitsap Quarry operations. Wetlands A and B are Category III Palustrine Forested/Scrub-Shrub, Permanently Flooded/Saturated wetlands. Wetland C is a Category III Palustrine Forested /Emergent, Permanently Flooded/Saturated wetland. Wetland D is a Category III Palustrine Forested, Permanently Flooded/Saturated wetland. Wetlands E, F, G, H, I, J, and K/L were all identified in 2014 to the west of the existing access road and quarry. Wetland E is a Category III Palustrine Forested, Scrub-Shrub Permanently Flooded/Saturated wetland. Wetland F is a Category IV Palustrine Forested, Saturated wetland. Wetlands G, H, and I are Category IV Palustrine Scrub-Shrub, Saturated wetlands. Wetland J is a Category III Palustrine Emergent, Saturated wetland. Wetland K/L is a Category III Palustrine Forested/Scrub-Shrub/Emergent, Seasonally Flooded/Saturated wetland. These wetlands are associated with Kitsap Creek or tributaries thereof.

Drainage Z, an unnamed ephemeral tributary to Kitsap Creek (Drainage X), was identified in the eastern portion of the subject property east of the existing access road. Drainages W and Y are unnamed channels identified within or near 300 feet of the proposed access road. Kitsap Creek is a perennial stream, wherein Drainages W and Y likely are seasonal. Kitsap Creek and Drainage W are likely Type F streams whereas Drainages Y and Z are likely Type Ns streams.

Access to existing mine operations currently utilizes a private road on-site which exits onto Archie Avenue, continues onto Kitsap Lake Road NW, and then onto Northlake Way NW. The existing route requires using a non-arterial residential road which is not conducive to industrial traffic. On the east side of the subject parcel, Werner Road, an industrially used and maintained arterial, leads directly to State Highway 3. Access to this industrial road can be obtained by constructing a relatively short private access route along portions of a relic logging road from the existing Kitsap Quarry site, which has already been approved by the City of Bremerton and Washington Department of Fish and Wildlife (WDFW). The access road is now proposed to also connect

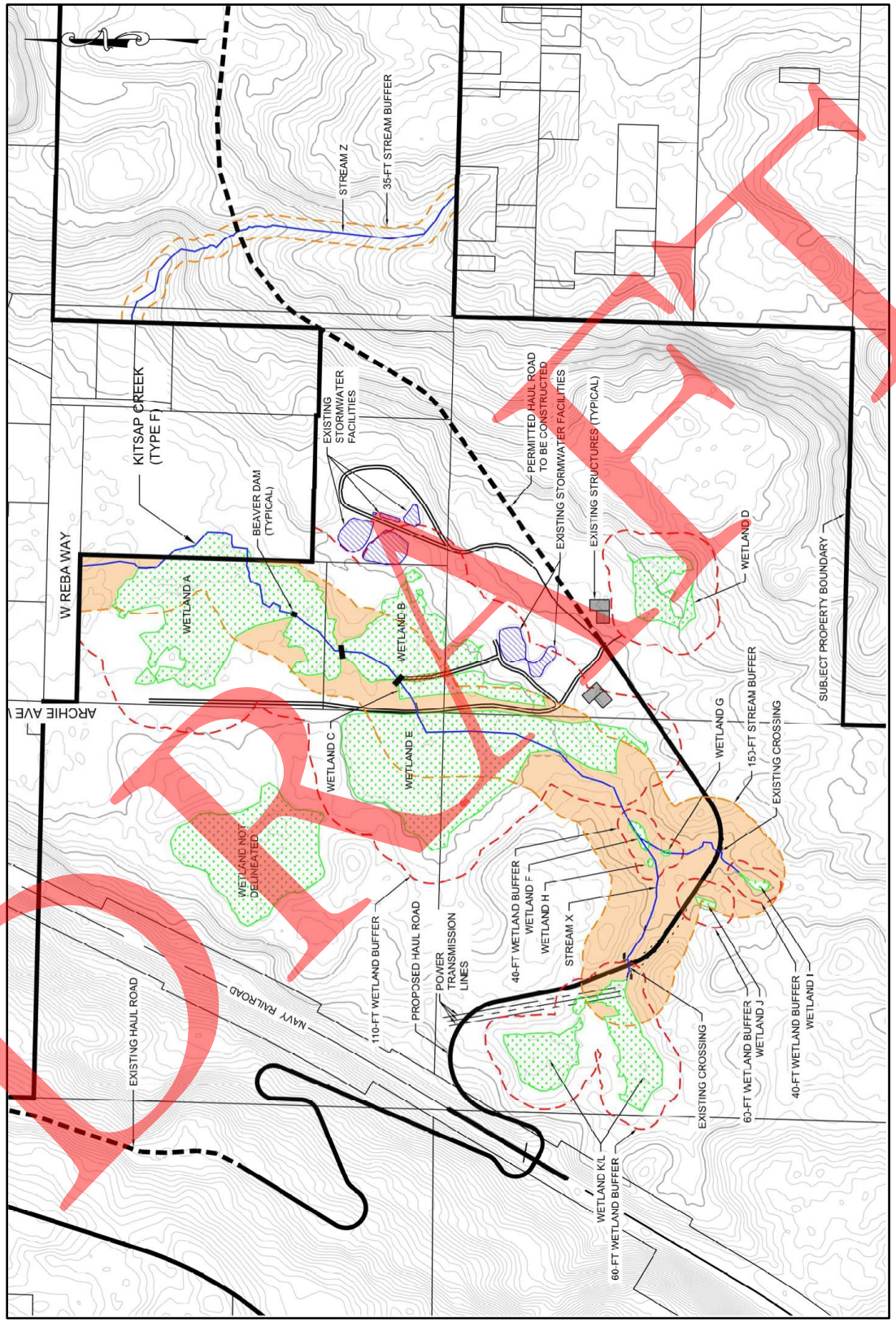
Kitsap Quarry to existing roads in Ueland Tree Farm in order to provide access from approved sand, gravel, and basalt mines in Ueland Tree Farm that will now use processing facilities at Kitsap Quarry.

Portions of the site are encumbered by wetlands, regulated drainages, and their respective buffers. Through careful planning efforts, both the proposed road alignment and optional alignment avoid wetland impacts and major drainage impacts to the greatest extent possible. Impacts are minimized by avoiding the need for wetland fill, limiting the extent of drainage crossings, replacing existing sub-standard culverts, and using appropriate materials and best management practices which are described in detail in the Habitat Management Plan (HMP) provided in Chapter 5 of this document. To mitigate for unavoidable impacts to critical areas buffers, all buffer areas impacted along the drainages and wetlands will be replanted and seeded with native vegetation which will restore habitat functions and prevent future erosion issues. Additionally, two existing non-functional culverts will be removed and replaced with appropriately-sized box culverts to facilitate fish passage and improve stream functions. As most impacts to the drainages are minimized and the buffers are being restored, no compensatory mitigation is proposed.

Feature Name	Approximate Size	Category / Type[A]	Regulated Under Kitsap County Code Title 19	Regulated Under Bremerton Municipal Code Title 20	Regulated Under RCW 90.48	Regulated Under Clean Water Act
Wetland A	209,483 sf	III	**Yes**	**NA[B]**	**Yes**	**Yes**
Wetland B	78,502 sf	III	**Yes**	**NA[B]**	**Yes**	**Yes**
Wetland C	20,969 sf	III	**Yes**	**NA[B]**	**Yes**	**Yes**
Wetland D	33,152 sf	III	**Yes**	**NA[B]**	**Yes**	**Likely**
Wetland E	270,000 sf	III	**Yes**	**NA[B]**	**Yes**	**Yes**
Wetland F	4,900 sf	IV	**Yes**	**NA[B]**	**Yes**	**Yes**
Wetland G	1,600 sf	IV	**Yes**	**NA[B]**	**Yes**	**Yes**
Wetland H	1,750 sf	IV	**Yes**	**NA[B]**	**Yes**	**Yes**
Wetland I	1,873 sf	IV	**Yes**	**NA[B]**	**Yes**	**Yes**
Wetland J	1,351 sf	III	**Yes**	**NA[B]**	**Yes**	**Not Likely**
Wetland K/L	95,805 sf	IV	**Yes**	**NA[B]**	**Yes**	**Yes**
Drainage W	474 lf	F	**Yes**	**NA[B]**	**Yes**	**Yes**
Kitsap Creek (Drainage X)	Off-site	F	**Yes**	**NA[B]**	**Yes**	**Yes**
Drainage Y	50 lf	Ns	**Yes**	**NA[B]**	**Yes**	**Yes**
Drainage Z	5,232 lf	Ns	**NA[B]**	**Yes**	**Yes**	**Likely**
Kitsap Creek	Off-site	F	**Yes**	**NA[B]**	**Yes**	**Yes**

A. Where applicable, water type per Kitsap County Code Title 19.300 and Bremerton Municipal Code Title 20.14.
B. Feature located outside of local regulatory limits.

Site Overview



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Figures

Tables

Appendices

Chapter 1. Introduction

Soundview Consultants LLC has been retained by Ueland Tree Farm LLC (Client) to complete a wetland and fish and wildlife habitat assessment and habitat management plan for a proposed private access road through portions of an approximately 135-acre project site composed of ten tax parcels. Three tax parcels are located within the City of Bremerton (Kitsap County Parcel Numbers: 192401-4-004-2004, 202401-1-019-2000 and 202401-1-031-2004). The remaining parcels are located in unincorporated Kitsap County, Washington (Kitsap County Parcel Numbers: 192401-4-004-2000, 192401-4-004-2002, 202401-3-004-2003, 202401-2-012-2005, 202401-2-026-2009, 192401-1-012-2000, and 202401-2-024-2001). These parcels are located west of Kitsap Creek where it exits Kitsap Lake in the southeast ¼ of Section 19 and the southwest ¼ of Section 20, Township 24 North, Range 01 East, W.M. The proposed project includes construction of a private 15-foot wide gravel access road from Werner Road through the existing Kitsap Quarry site to Ueland Tree Farm (UTF). The portion of the road extending from Werner Road to Kitsap Quarry has been approved by the City of Bremerton and Washington Department of Fish and Wildlife (WDFW). The remaining section of road is subject to Kitsap County jurisdiction.

The subject property largely sits in a portion of undeveloped forest land with residentially developed areas to the north and east and industrial uses associated with mining and forestry industries located to the west and south. The topography of the subject property generally slopes down from the northeast and west to the valley floor in the central portion of the site. UTF and Kitsap Quarry wish to shift existing truck traffic from the current route, which travels through Kitsap Lake Road, a residential road, to an industrial arterial with similar existing uses.

The purpose of this wetland and fish and wildlife habitat assessment is to identify the presence of potentially regulated wetlands, fish and wildlife habitat, and/or priority species on or near the proposed project, excluding areas of active mining, in order to determine what development limitations the proposed project may face under Kitsap County Code (KCC) and Bremerton Municipal Code (BMC). Following this assessment, this report provides a Habitat Management Plan (HMP) that satisfies the criteria outlined in KCC Title 19 and BMC Title 20 along with conclusions and recommendations regarding:

- Site description, project description, and area of assessment;
- Background research and identification of potentially regulated critical areas and habitats within the vicinity of the proposed project;
- Identification and assessment of potentially regulated wetlands and waterbodies;
- Identification and assessment of potentially regulated fish and wildlife habitat and/or priority species located on or near the subject property;
- Standard buffer recommendations;
- Existing site map detailing identified critical areas and standard buffers;
- Proposed site plans;
- Documentation of critical area avoidance, minimization, and mitigation measures;
- Non-compensatory critical area mitigation actions, and
- Supplemental information necessary for Federal, State, and local regulatory review.

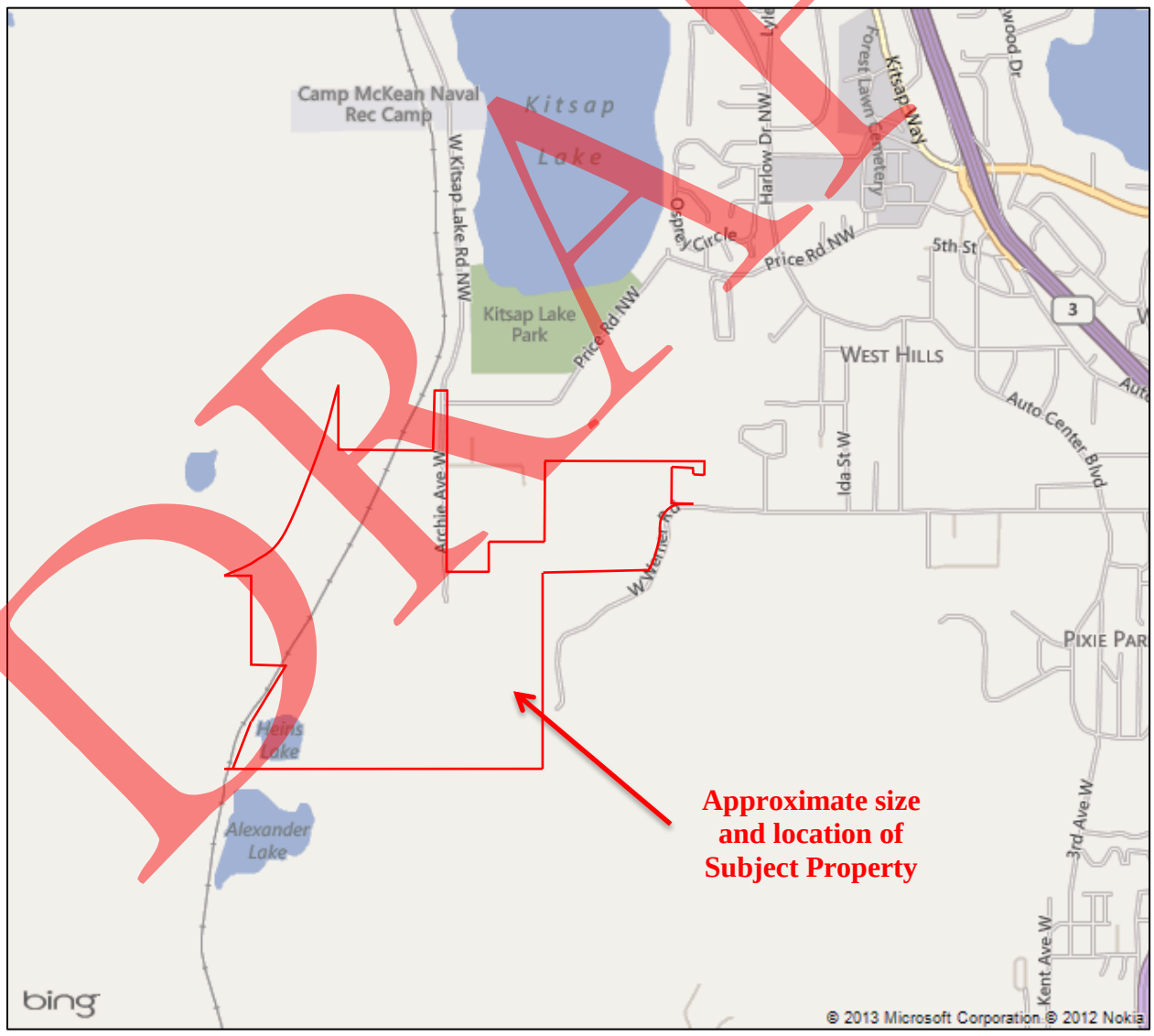
Chapter 2. Proposed Project

2.1 Project Location

The subject property is located near 818 Archie Avenue West, Bremerton. The subject property is situated in the southeast ¼ of Section 19 and the southwest ¼ of Section 20, Township 24 North, Range 01 East, W.M. and is largely bounded by undeveloped forest land and gravel mines (Figure 1) within Kitsap County.

To reach Kitsap Quarry traveling north bound on WA-16, bear slight right toward WA-3N. Continue straight onto WA-3N. Take the Kitsap Way exit and turn left onto Kitsap Way. After approximately 1.4 miles, bear left onto Northlake Way NW. After 0.4 mile, turn left onto Kitsap Lake Road NW. Proceed 1.2 miles and turn right onto Archie Avenue West. Take the first right to stay on Archie Avenue West. Continue to follow the road until you reach the quarry site. Access to the site is gated, prior arrangements with the client may be necessary to gain access.

Figure 1. Vicinity Map.



2.2 Project Description

Currently, traffic leaving the Kitsap Quarry site exits onto Archie Avenue, a small residential road, where it continues onto Kitsap Lake Road Northwest before entering Northlake Way Northwest. The majority of the roads associated with this existing route primarily service residential uses. Kitsap Quarry recently gained approval from the City of Bremerton and WDFW to create a new haul route from their existing quarry site to Werner Road. This preferable route will not only provide a direct connection to the State highway system, but will also be consistent with surrounding parcels zoned for industrial purposes. Currently, two mines use this route as well as a UPS distribution center. By contrast, the existing route through Kitsap Lake Way is primarily associated with residentially zoned parcels and serves no other known commercial/industrial uses other than the traffic from Kitsap Quarry. UTF, which currently uses a similar access route through residential areas, would also like to utilize this alternative access route and has acquired the necessary properties to do so.

Due to critical areas in the vicinity (wetlands, streams and steep slopes), the only viable route from Kitsap Quarry to Werner Road traverses a non-fish bearing seasonal/ephemeral drainage which runs perpendicular to the proposed route. While the drainage does not provide suitable fish and wildlife habitat, the section of road approved by City of Bremerton and WDFW will utilize a culvert designed using guidance from WDFW Design of Road Culverts for Fish Passage. The intent of this culvert design is to cause minimal change and impact to the existing drainage channel. This design will allow sediment and organic material to continue to be transported downstream at existing rates.

In addition, the UTF now proposes to extend this approved access road further to the west to connect Kitsap Quarry to existing roads in UTF in order to provide access from proposed sand, gravel, and basalt mines in UTF to the processing facilities at Kitsap Quarry. Two viable routes have been identified for this section of the proposed access road. The primary route proposes two stream crossings but would utilize an existing road alignment and would provide replacement of two existing culverts with two large box culverts that would likely reestablish upstream fish habitat. An alternate design would propose only one stream crossing and has reduced footprint in various critical areas buffers; however, it would not include removal or use of the existing road and proposes all new impacts. After coordination with the owner, State regulatory staff, and tribal representatives this report will focus on the primary route option and all areas within three hundred (300) feet on either side of the proposed road. This report excludes formal assessment of all areas beyond the 300 feet of the primary road alignment.

The project also proposes to manage stormwater and runoff by installing low impact design (LID) rain gardens for natural dispersion. One stormwater detention and water quality facility and three (3) bio-retention facilities are proposed. All proposed facilities are outside wetland buffer areas or within areas of the wetland buffers that will be interrupted by the proposed roadway.

An HMP has been prepared for this project and can be found in Chapter 5 of this document. No other wetlands, fish and wildlife habitat or associated buffers will be impacted by this project.

Chapter 3. Methods

Parcels encompassing the proposed access road were assessed by qualified wetland and fisheries scientists according to the standards set forth in, where applicable, KCC Title 19 and BMC Title 20. Potentially regulated wetlands and fish and wildlife habitat features within approximately 300 feet of the proposed road centerline were delineated and assessed during the summer and winter of 2012 and February of 2014. Potentially regulated areas were inspected using multiple assessment methods with special emphasis given to the wetlands and potential critical areas nearest to the proposed access road, excluding areas of active mining operations. All wetland determinations were made using observable vegetation, hydrology, and soils in conjunction with data from the National Wetlands Inventory and Kitsap County GIS maps.

Wetland boundaries were determined using the routine approach described in the U.S. Army Corps of Engineers' Wetland Delineation Manual (USACE, 1987) and modified according to the guidelines established in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE, 2010). Eleven (11) wetlands were found in Kitsap County jurisdiction and within the vicinity of the project site. These wetlands were classified using both the hydrogeomorphic (Brinson, 1993) and Cowardin classification systems (Cowardin, 1979). Following classification and assessment, the wetland was rated and categorized using the *Washington State Wetlands Rating System for Western Washington – Revised* (Hruby, 2004) and guidelines established in the KCC Title 19, Sections 200.210.B.

The fish and wildlife habitat assessment was conducted during the same site visits. Publicly available background data was queried for documented wildlife observations and/or the presence of potentially regulated fish and wildlife habitat on or near the site. In addition, high-resolution aerial photography of the surrounding area was carefully examined. Visual observations using stationary and walking survey methods were utilized for both potential aquatic and upland habitats. Any special habitat features or signs of wildlife activity were noted, and these areas were thoroughly re-inspected.

Ordinary High Water (OHW) determinations were conducted using the Washington State Department of Ecology's (WSDOE) method as detailed in determining the Ordinary High Water Mark on Streams in Washington State (Olson, 2008); definitions provided in RCW 77.55.011 (11) and WAC 220.110.020 (69); and USACE's Regulatory Guidance Letter No. 05-05 Ordinary High Water Mark Identification (2005).

All wetland boundaries and drainage features were inspected, delineated and surveyed during the summer and winter of 2012 and winter of 2014. To mark the boundary between wetlands and uplands, orange surveyor's flagging was alpha-numerically labeled and tied to vegetation or wood lath along the wetland boundary. Delineation of drainage OHW marks were tied to vegetation with blue surveyor's flagging. To mark the points where data was collected, pink surveyor's flagging was alpha-numerically labeled and tied at each sampling location. The location of each wetland boundary flag, data plot, and drainage feature within 300 feet of the proposed roadway was professionally surveyed by Contour Engineering, PLLC. Areas beyond 300 feet were mapped using a Trimble GEOXH geographical positioning receiver with sub-meter accuracy or estimated using aerial photography. The locations and features of the wetlands and drainage features are described in Chapter 4, and shown on the plan sheets in Appendix C.

Chapter 4. Existing Conditions

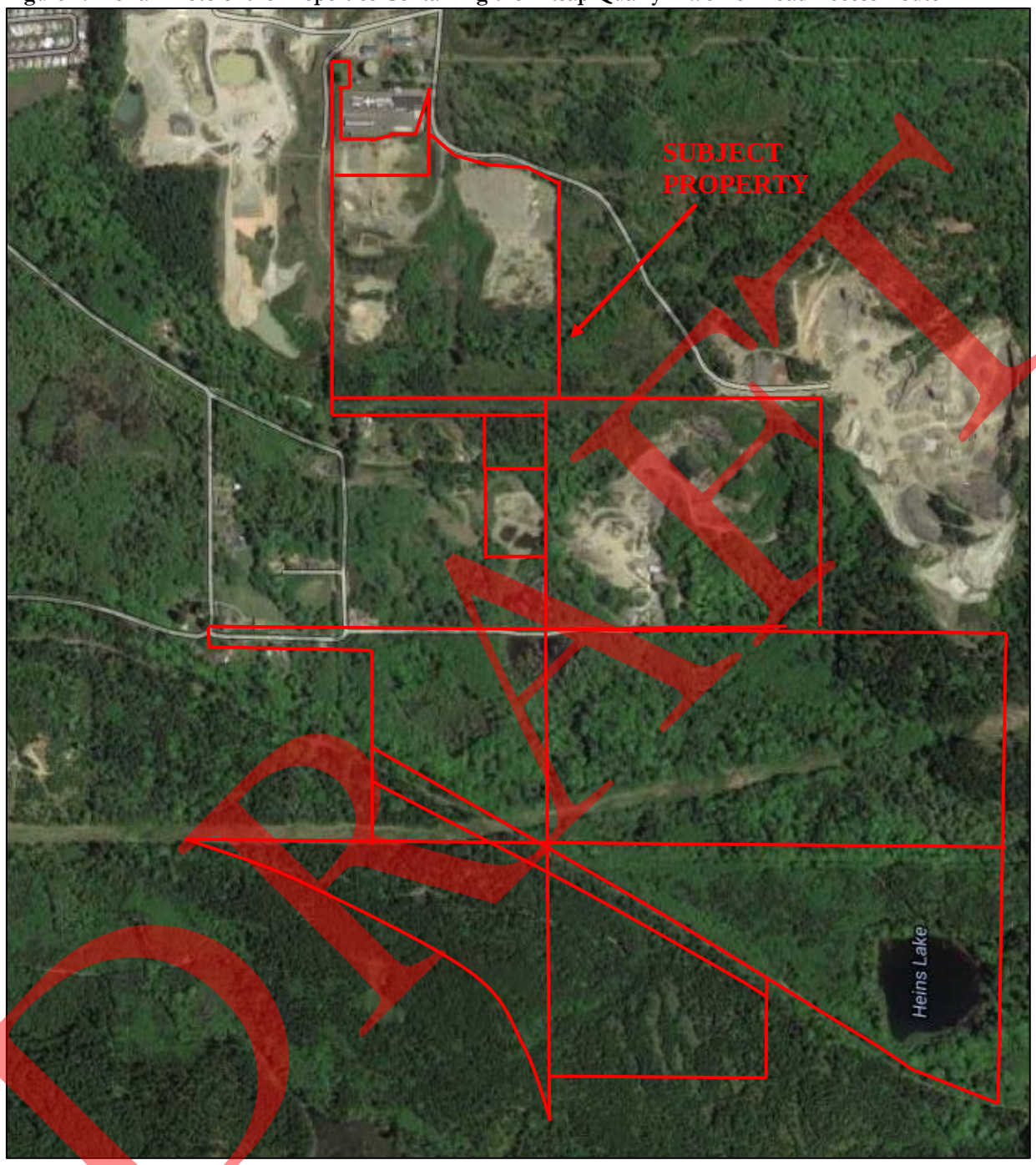
4.1 Landscape Setting

With the exception of critical areas and associated buffers, most of the central and eastern portions of the subject property consist primarily of bare earth outlined with non-native invasive vegetation. These areas are currently used as an active quarry and storage lot for industrial machinery and associated materials.

The western portions of the subject property are dominated by mixed deciduous/coniferous forest of big leaf maple, red alder, western red cedar, Douglas fir, and western hemlock over an understory of evergreen huckleberry, Indian plum, salal, and western sword fern. This area is partially interrupted by a power line easement and railroad track which bisect the forested area. The power line easement area is dominated by non-native invasive plant species such as Scotch broom and Himalayan blackberry.

The subject property slopes down to the valley floor in the south-central area where an active gravel mine (Kitsap Quarry) is located. Kitsap Quarry has been active since it was established in the 1960's and has three significant structures, gravel roads and machinery on-site associated with its uses. Adjacent to the mining area, wetlands and other aquatic features were identified near the edge of the subject property boundaries to the north extending further off-site and to the west toward UTF. A minor spring-fed wetland was also identified exiting the hillside in the southwest of the existing structures on-site. Upland portions are forested with a mixed deciduous/coniferous canopy of big leaf maple, red alder, western red cedar, Douglas fir over an understory of Himalayan blackberry, salal, trailing blackberry, evergreen huckleberry, and western sword fern.

Figure 2. Aerial Photo of the Properties Containing the Kitsap Quarry – Werner Road Access Route



4.2 Wetlands

4.2.1 Overview

The site investigation identified eleven wetlands located within the subject property (Wetlands A, B, C, D, E, F, G, H, I, J, and K/L). The wetlands contained indicators of wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation which satisfied the criteria set forth in Chapter 3. All wetlands were found to be located within unincorporated Kitsap County. Please see

Appendix C for a site map. Wetlands A through D were considered to be subject to high-intensity land use due to their proximity to the Kitsap Quarry mine. However, Wetlands E through K/L are not adjacent to mining activities; and therefore, are not likely subject to high-intensity uses. Wetlands E through K/L are, however, adjacent to the proposed transportation road location for the mine and should be reviewed under moderate-intensity land use.

Wetland A is a Palustrine Forested/Scrub-Shrub, Permanently Flooded/Saturated, beaver-modified wetland, approximately 209,483 square feet (4.81 acre) in size and is located entirely off-site, roughly 700 feet northwest of the proposed access road centerline. Wetland A is vegetated primarily with unidentified grasses, skunk cabbage, and red alder. Upland areas adjacent to Wetland A are vegetated with Himalayan blackberry, western swordfern, and salal. Using the current WSDOE rating methods (Hruby, 2004), this wetland is a Category III depressional-outflow wetland scoring 22 points for habitat functions. Using a High Land Use Intensity consistent with KCC Table 19.200.220, the recommended buffer for Wetland A is 150 feet.

Wetland B is a Palustrine Forested/Scrub-Shrub, Permanently Flooded/Saturated, beaver-modified wetland, approximately 78,502 square feet (1.80 acre) in size, located to the southwest of Wetland A and roughly 350 feet northwest of the proposed access road centerline. Approximately 8,370 square feet (0.19 acre) occurs within the subject property. Wetland B is vegetated primarily with unidentified grasses, sedges, and red alder. Upland areas adjacent to Wetland B are vegetated with Himalayan blackberry, western swordfern, and salal. This wetland is distinctly separated from Wetlands A and C by a beaver dam (illustrated on sheet 1 in Appendix C). Using the current WSDOE rating method (Hruby, 2004), this wetland is a Category III depressional-outflow wetland scoring 24 points for habitat functions. Using a High Land Use Intensity consistent with KCC Table 19.200.220, the recommended buffer for Wetland B is 150 feet.

Wetland C is a Palustrine Forested/Emergent, Permanently Flooded/Saturated, beaver-modified wetland, approximately 20,969 square feet (0.48 acre) in size, located to the east of the existing mine access road and to the west of Wetland B. Approximately 12,814 square feet (0.29 acre) occurs within the subject property. Wetland C is vegetated primarily with salmonberry, skunk cabbage, red alder, and Scouler's willow. Upland areas adjacent to Wetland C are vegetated with Himalayan blackberry, western swordfern, and salal. This wetland is separated from Wetland B by a beaver dam (illustrated on sheet 1 of Appendix C). Wetland C is roughly 250 feet north of the proposed access road centerline. Using the current WSDOE rating methods (Hruby, 2004), this wetland is a Category III depressional-outflow wetland scoring 22 points for habitat functions. Using a High Land Use Intensity consistent with KCC Table 19.200.220, the recommended buffer for Wetland C is 150 feet.

Wetland D is a Palustrine Forested, Permanently Flooded/Saturated, excavated wetland, approximately 33,152 square feet (0.76 acre) in size, located roughly 150 feet south of the proposed access road. Wetland D is vegetated primarily with buttercup, salmonberry, lady fern, and bracken fern. Upland areas adjacent to Wetland D are vegetated with western swordfern, salal, big leaf maple, and western hemlock. Using the current WSDOE rating methods (Hruby, 2004), this wetland is a Category III depressional-outflow wetland scoring 14 points for habitat functions. Using a High Land Use Intensity consistent with KCC Table 19.200.220, the recommended buffer for Wetland D is 80 feet.

Wetland E is a Palustrine Forested/Aquatic Bed, Permanently Flooded, beaver-modified wetland, approximately 270,000 square feet (6.20 acre) in size, located roughly sixty (60) feet north of the proposed access road. Wetland E is vegetated primarily with salmonberry with piggyback and lady fern. Upland areas adjacent to Wetland E are vegetated by red alder, vine maple, western hemlock, sword fern, and salmonberry. Using the current WSDOE rating methods (Hruby, 2004), this wetland is a Category III depressional-outflow wetland scoring 25 points for habitat functions. Using a Moderate Land Use Intensity consistent with KCC Tables 19.200.220 A and D, the recommended buffer for Wetland E is 110 feet.

Wetland F is a Palustrine Forested, Saturated wetland, approximately 4,900 square feet (0.11 acre) in size, located roughly 200 feet north of the proposed access road. Wetland F is vegetated primarily with red alder with an understory dominated by salmonberry. Upland areas adjacent to Wetland F are vegetated by red alder, vine maple, western hemlock, sword fern, and salmonberry. Using the current WSDOE rating methods (Hruby, 2004), this wetland is a Category IV slope wetland scoring 19 points for habitat functions. Using a Moderate Land Use Intensity consistent with KCC Table 19.200.220, the recommended buffer for Wetland F is 40 feet.

Wetland G is a Palustrine Scrub-Shrub, Saturated wetland, approximately 1,600 square feet (0.04 acre) in size, located roughly 130 feet north of the proposed access road. Wetland G is vegetated primarily with salmonberry with piggyback and lady fern. Upland areas adjacent to Wetland G are vegetated by red alder, salmonberry, and sword fern. Using the current WSDOE rating methods (Hruby, 2004), this wetland is a Category IV slope wetland scoring 17 points for habitat functions. Using a Moderate Land Use Intensity consistent with KCC Table 19.200.220, the recommended buffer for Wetland G is 40 feet.

Wetland H is a Palustrine Scrub-Shrub, Saturated wetland, approximately 1,750 square feet (0.04 acre) in size, located roughly 165 feet north of the proposed access road. Wetland H is vegetated primarily with salmonberry. Upland areas adjacent to Wetland H are vegetated by red alder, vine maple, western hemlock, salmonberry, and sword fern. Using the current WSDOE rating methods (Hruby, 2004), this wetland is a Category IV slope wetland scoring 17 points for habitat functions. Using a Moderate Land Use Intensity consistent with KCC Table 19.200.220, the recommended buffer for Wetland H is 40 feet.

Wetland I is a Palustrine Scrub-Shrub, Saturated wetland, approximately 1,873 square feet (0.04 acre) in size, located roughly 90 feet south of the proposed access road. Wetland I is vegetated primarily with salmonberry with piggyback and lady fern. Upland areas adjacent to Wetland I are vegetated by red alder, western red cedar (arborvitae) vine maple, western hemlock, sword fern, and salmonberry. Using the current WSDOE rating methods (Hruby, 2004), this wetland is a Category IV slope wetland scoring 18 points for habitat functions. Using a Moderate Land Use Intensity consistent with KCC Table 19.200.220, the recommended buffer for Wetland I is 40 feet.

Wetland J is a Palustrine Emergent, Seasonally Flooded wetland, approximately 1,351 square feet (0.03 acre) in size, located roughly 10 feet south of the proposed access road. Wetland J is vegetated primarily with water parsley and bulrush. Upland areas adjacent to Wetland J are vegetated by Doug fir, red alder, and big leaf maple. Using the current WSDOE rating methods (Hruby, 2004), this wetland is a Category III depressional-outflow wetland scoring 12 points for habitat functions. Using a Moderate Land Use Intensity consistent with KCC Table 19.200.220, the recommended buffer for Wetland J is 60 feet.

Wetland K/L is a Palustrine Forested/Scrub-Shrub/Emergent, Seasonally Flooded/Saturated wetland, approximately 95,805 square feet (2.20 acre) in size, located roughly 115 feet, 80 feet, and 30 feet south of the proposed access road at three different points. Wetland K/L is vegetated primarily with red alder, willow, hardhack, salmonberry, lady fern, and slough sedge. Upland areas adjacent to Wetland K/L are vegetated by red alder, western hemlock, western red cedar, devil's club, salmonberry, sword fern, deer fern, red huckleberry, and lady fern. Using the current WSDOE rating methods (Hruby, 2004), this wetland is a Category III depressional-outflow wetland scoring 25 points for habitat functions. Using a Moderate Land Use Intensity consistent with KCC Table 19.200.220, the recommended buffer for Wetland K/L is 110 feet.

Appendix B includes a USFWS National Wetland Inventory map (B1), WDFW salmonid distribution map (B2), Kitsap County Buildable Lands Map (B3), and NRCS Soil Survey Map (B4). Appendix D includes wetland delineation data sheets, wetland rating forms can be found in Appendix E.

Table 1. Wetlands on the Subject Property.

Wetland	Predominant Wetland Classification / Rating				Wetland Size (acres)	Buffer Width (feet)[E]
	Cowardin[A]	HGM[B]	Ecology[C]	Kitsap County[D]		
A	PFO/SSH/Bb	Depressional Outflow	III	III	4.81	150
B	PFO/SSH/Bb	Depressional Outflow	III	III	1.80	150
C	PFO/EMH/Bb	Depressional Outflow	III	III	0.48	150
D	PFOH/Bbx	Depressional Outflow	III	III	0.76	80
E	PFO/ABHb	Depressional Outflow	II	III	6.20	110
F	PFOB	Slope	IV	IV	0.11	40
G	PSSB	Slope	IV	IV	0.04	40
H	PSSB	Slope	IV	IV	0.04	40
I	PSSB	Slope	IV	IV	0.04	40
J	PEMC	Depressional	III	III	0.03	60
K/L	PFO/SS/EMH/B	Depressional Outflow	III	III	2.20	110
Total					**16.51**	

Notes:

A. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations

B. Brinson, M. M. (1993).

C. Ecology rating according to Washington State Wetland Rating System for Western Washington – Revised Hruby (2004).

D. Kitsap County Code (19.800.210).

E. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).

Table 2. Wetland A Summary.

WETLAND A - INFORMATION SUMMARY	
Location:	Located on the edge of the subject property boundary to the northwest

Local Jurisdiction	Kitsap County
WRIA	15
Ecology Rating[A]	III
Kitsap County Rating[B]	III
Kitsap County Buffer Width[C]	150 feet
Estimated Wetland Size	209,483 SF (4.81 Acre)
Cowardin Classification[D]	PFO/SSH/Bb
HGM Classification[E]	Depressional-Outflow
Wetland Data Sheet(s)	SP-03W
Upland Data Sheet (s)	SP-02U
Boundary Flag color	Orange

Dominant Vegetation	Wetland A is dominated by various unidentified grasses, skunk cabbage and red alder
Soils	Norma Fine Sandy Loam and Belfast Loam
Hydrology	Permanent inundation and saturation due to presence of Kitsap Creek and stormwater runoff associated with the quarry.
Rationale for Delineation	Areas of well-defined surface saturation, inundation and hydrophytic vegetation. Upland areas were determined by topographic rise and predominance of upland plant species, predominately Himalayan blackberry.
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.
Wetland Functions Summary	
Water Quality	The partially vegetated beaver pond within Wetland A has the potential to retain any remnant sediments and pollutants from treated stormwater runoff associated with the existing quarry.
Hydrologic	Due to the dams created by beaver activity, this wetland has a moderate storage volume.
Habitat	Wildlife habitat functions provided by the wetland may include large mammal cover and forage, small mammal forage and cover, fish foraging and small bird forage and nesting.
Buffer Condition	The buffer surrounding the wetland is dominated by both native and invasive plant species, predominately Himalayan blackberry, western swordfern and salal. The buffer is interrupted partially to the southeast by existing stormwater facilities and associated gravel access roads. The western buffer is also interrupted by the existing mine access road which is lined by a fringe of Himalayan blackberry.

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).
B. Kitsap County Code (19.800.210).
C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).
D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations
E. Brinson, M. M. (1993).

Table 3. Wetland B Summary.

WETLAND B - INFORMATION SUMMARY		
Location:	Located on the edge of the subject property boundary to the northwest	
	**Local Jurisdiction**	Kitsap County
	WRIA	15
	Ecology Rating[A]	III
	Kitsap County Rating[B]	III
	Kitsap County Buffer Width[C]	150 feet
	Estimated Wetland Size	78,502 SF (1.80 Acre)
	Cowardin Classification[D]	PFO/SSH/Bb
	HGM Classification[E]	Depressional-Outflow
	Wetland Data Sheet(s)	SP-01W
	Upland Data Sheet (s)	SP-02U
	Boundary Flag color	Orange
Dominant Vegetation	Wetland B is dominated by various unidentified grasses, sedges and red alder	
Soils	Norma Fine Sandy Loam	
Hydrology	Permanent inundation and saturation due to presence of Kitsap Creek and stormwater runoff associated with the quarry.	
Rationale for Delineation	Areas of well-defined surface saturation, inundation and hydrophytic vegetation (sedges). Upland areas were determined by topographic rise and predominance of upland plant species, predominately Himalayan blackberry.	
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.	
Wetland Functions Summary		
Water Quality	The partially vegetated beaver pond within Wetland B has the potential to retain any remnant sediments and pollutants from treated stormwater runoff associated with the existing quarry.	
Hydrologic	Due to the dams created by beaver activity, this wetland has a higher storage volume than Wetland A.	
Habitat	Wildlife habitat functions provided by the wetland may include large mammal cover and forage, small mammal forage and cover, fish foraging and small bird forage and nesting.	
Buffer Condition	The buffer surrounding the wetland is dominated by both native and invasive plant species, predominately Himalayan blackberry, western swordfern and salal. The buffer is interrupted partially to the east by existing stormwater facilities and to the west by an existing gravel road and the mine access road.	

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).
B. Kitsap County Code (19.800.210).
C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).
D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations
E. Brinson, M. M. (1993).

Table 4. Wetland C Summary.

WETLAND C - INFORMATION SUMMARY			
Location:	Located on the edge of the subject property boundary to the northwest		
		**Local Jurisdiction**	Kitsap County
		WRIA	15
		Ecology Rating[A]	III
		Kitsap County Rating[B]	III
		Kitsap County Buffer Width[C]	150 feet
		Estimated Wetland Size	20,969 SF (0.48 Acre)
		Cowardin Classification[D]	PFO/EMH/Bb
		HGM Classification[E]	Depressional-Outflow
		Wetland Data Sheet(s)	SP-05W
		Upland Data Sheet (s)	SP-04U
		Boundary Flag color	Orange
Dominant Vegetation	Wetland C is dominated by salmonberry, skunk cabbage, red alder and Scouler's willow.		
Soils	Norma Fine Sandy Loam		
Hydrology	Permanent inundation and saturation due to presence of Kitsap Creek and stormwater runoff associated with the quarry.		
Rationale for Delineation	Areas of well-defined surface saturation, inundation and hydrophytic vegetation. Upland areas were determined by topographic rise and predominance of upland plant species, predominately Himalayan blackberry and western swordfern.		
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.		
Wetland Functions Summary			
Water Quality	The partially vegetated beaver pond within Wetland C has the potential to retain any remnant sediments and pollutants from treated stormwater runoff associated with the existing quarry.		
Hydrologic	Due to the dam created by beaver activity, this wetland has a lower storage volume than Wetland A and B.		
Habitat	Wildlife habitat functions provided by the wetland may include mammal cover and forage, fish foraging and small bird forage and nesting.		
Buffer Condition	The buffer surrounding the wetland is dominated by both native and invasive plant species, predominately Himalayan blackberry, swordfern and salal. The buffer is substantially interrupted to the south, west and east by gravel roads. The buffer in these areas provides no screening of the wetland from outside disturbances.		

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).
B. Kitsap County Code (19.800.210).
C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).
D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations
E. Brinson, M. M. (1993).

Table 5. Wetland D Summary.

WETLAND D - INFORMATION SUMMARY			
Location:	Located southwest of the existing storage structures on-site		
		**Local Jurisdiction**	Kitsap County
		WRIA	15
		Ecology Rating[A]	III
		Kitsap County Rating[B]	III
		Kitsap County Buffer Width[C]	80 feet
		Estimated Wetland Size	33,152 SF (0.76 Acre)
		Cowardin Classification[D]	PFOH/Bbx
		HGM Classification[E]	Depressional-Outflow
		Wetland Data Sheet(s)	SP-07W
		Upland Data Sheet (s)	SP-08U
		Boundary Flag color	Orange
Dominant Vegetation	Wetland D is dominated by buttercup, salmonberry, lady fern and bracken fern.		
Soils	Norma Fine Sandy Loam		
Hydrology	Permanent inundation and saturation due to stormwater runoff from upland quarry areas.		
Rationale for Delineation	Areas of well-defined surface saturation, inundation and hydrophytic vegetation. Upland areas were determined by topographic rise and predominance of upland plant species, predominately western swordfern and western red cedar.		
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.		
Wetland Functions Summary			
Water Quality	The un-vegetated excavated pond within Wetland D has the potential to retain any remnant sediments and pollutants from treated stormwater runoff associated with the upland mining activity. However, this potential is diminished due to the inlet and outlet being located adjacent to each other.		
Hydrologic	Located upstream of two detention facilities on-site. Live storage capacity is low, therefore, hydrologic functions are limited to minor reductions of surface flows during storm events.		
Habitat	Wildlife habitat functions provided by the wetland may include mammal forage and cover and small bird forage and nesting.		
Buffer Condition	The buffer surrounding the wetland is dominated by native plant species, predominately western swordfern, salal, big leaf maple and western hemlock. The buffer is substantially impacted by adjacent gravel roads to the north and west associated with the mining activity. The buffer in these areas provides no screening of the wetland from outside disturbances.		

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).
B. Kitsap County Code (19.800.210).
C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).
D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations
E. Brinson, M. M. (1993).

Table 6. Wetland E Summary.

WETLAND E - INFORMATION SUMMARY		
Location:	Located northwest of the existing structures on-site	
	**Local Jurisdiction**	Kitsap County
	WRIA	15
	Ecology Rating[A]	II
	Kitsap County Rating[B]	III
	Kitsap County Buffer Width[C]	110 feet
	Estimated Wetland Size	270,000 sf (6.20 acres)
	Cowardin Classification[D]	PFO/ABHb
	HGM Classification[E]	Depressional-Outflow
	Wetland Data Sheet(s)	SP-11
	Upland Data Sheet (s)	SP-12
	Boundary Flag color	Orange
Dominant Vegetation	Wetland E is dominated by red alder over salmonberry with patchy piggyback plant as groundcover.	
Soils	Norma Fine Sandy Loam, Ragnar Fine Sandy Loam, and Belfast Loam	
Hydrology	Seasonal saturation due to stormwater runoff from upland quarry areas.	
Rationale for Delineation	Areas of well-defined hydric soils, ponding, and/or hydrophytic vegetation. Upland areas were determined by topographic rise and predominance of upland plant species, predominately western sword fern and western red cedar.	
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.	
Wetland Functions Summary		
Water Quality	Wetland E has the potential to retain any remnant sediments and pollutants from treated stormwater runoff associated with the an adjacent gravel road to the east.	
Hydrologic	Live storage capacity is high; therefore, hydrologic functions include reductions of surface flows during storm events, storm water storage, and sediment retention.	
Habitat	Wildlife habitat functions provided by the wetland may include mammal forage and cover and small bird forage and nesting.	
Buffer Condition	The buffer surrounding the western portion of the wetland is dominated by native plant species, predominately western sword fern, salal, big leaf maple and western hemlock. The buffer is substantially impacted by an adjacent gravel road to the east. The buffer in this area provides no screening of the wetland from outside disturbances.	

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).

B. Kitsap County Code (19.800.210).

C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).

D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations

E. Brinson, M. M. (1993).

Table 7. Wetland F Summary.

WETLAND F - INFORMATION SUMMARY			
Location:	Located southwest of Wetland E		
		**Local Jurisdiction**	Kitsap County
		WRIA	15
		Ecology Rating[A]	IV
		Kitsap County Rating[B]	IV
		Kitsap County Buffer Width[C]	40 feet
		Estimated Wetland Size	4,900 sf (0.11 acre)
		Cowardin Classification[D]	PFOB
		HGM Classification[E]	Slope
		Wetland Data Sheet(s)	SP-14
		Upland Data Sheet (s)	SP-15
		Boundary Flag color	Orange
Dominant Vegetation	Wetland F is dominated by red alder over salmonberry and piggyback plant.		
Soils	Ragnar Fine Sandy Loam		
Hydrology	Saturation due seeps.		
Rationale for Delineation	Areas of well-defined surface saturation and hydrophytic vegetation. Upland areas were determined by topographic rise and predominance of upland plant species, predominately western sword fern and western red cedar.		
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.		
Wetland Functions Summary			
Water Quality	The partially vegetated wetland has limited potential to retain sediments and pollutants from any unknown stormwater runoff and pollutant sources.		
Hydrologic	Located adjacent to onsite stream. Live storage capacity is low; therefore, hydrologic functions are limited to minor reductions of surface flows during storm events.		
Habitat	Wildlife habitat functions provided by the wetland may include mammal forage and cover and small bird forage and nesting.		
Buffer Condition	The buffer surrounding the wetland is dominated by native plant species, predominately western sword fern, vine maple, western red cedar, and western red hemlock.		

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).

B. Kitsap County Code (19.800.210).

C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).

D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations

E. Brinson, M. M. (1993).

Table 8. Wetland G Summary.

WETLAND G - INFORMATION SUMMARY			
Location:	Located southwest of Wetland F		
		**Local Jurisdiction**	Kitsap County
		WRIA	15
		Ecology Rating[A]	IV
		Kitsap County Rating[B]	IV
		Kitsap County Buffer Width[C]	40 feet
		Estimated Wetland Size	1,600 sf (0.04 acre)
		Cowardin Classification[D]	PSSB
		HGM Classification[E]	Slope
		Wetland Data Sheet(s)	SP-16
		Upland Data Sheet (s)	SP-17
		Boundary Flag color	Orange
Dominant Vegetation	Wetland G is dominated by red alder over salmonberry and piggyback plant.		
Soils	Ragnar Fine Sandy Loam		
Hydrology	Saturation due to seeps.		
Rationale for Delineation	Areas of well-defined surface saturation and hydrophytic vegetation. Upland areas were determined by topographic rise and predominance of upland plant species, predominately western sword fern and western red cedar.		
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.		
Wetland Functions Summary			
Water Quality	The partially vegetated wetland has limited potential to retain sediments and pollutants from any unknown stormwater runoff and pollutant sources.		
Hydrologic	Located adjacent to onsite stream. Live storage capacity is low; therefore, hydrologic functions are limited to minor reductions of surface flows during storm events.		
Habitat	Wildlife habitat functions provided by the wetland may include mammal forage and cover and small bird forage and nesting.		
Buffer Condition	The buffer surrounding the wetland is dominated by native plant species, predominately western sword fern, vine maple, western red cedar, and western hemlock.		

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).

B. Kitsap County Code (19.800.210).

C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).

D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations

E. Brinson, M. M. (1993).

Table 9. Wetland H Summary.

WETLAND H - INFORMATION SUMMARY			
Location:	Located west of Wetland F		
		**Local Jurisdiction**	Kitsap County
		WRIA	15
		Ecology Rating[A]	IV
		Kitsap County Rating[B]	IV
		Kitsap County Buffer Width[C]	40 feet
		Estimated Wetland Size	1,750 sf (0.04 acre)
		Cowardin Classification[D]	PSSB
		HGM Classification[E]	Slope
		Wetland Data Sheet(s)	SP-18
		Upland Data Sheet (s)	SP-19
		Boundary Flag color	Orange
Dominant Vegetation	Wetland H is dominated by salmonberry and piggyback plant.		
Soils	Ragnar Fine Sandy Loam		
Hydrology	Saturation due to seeps.		
Rationale for Delineation	Areas of well-defined surface saturation and hydrophytic vegetation. Upland areas were determined by topographic rise and predominance of upland plant species, predominately western sword fern and western red cedar.		
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.		
Wetland Functions Summary			
Water Quality	The partially vegetated wetland has limited potential to retain sediments and pollutants from any unknown stormwater runoff and pollutant sources.		
Hydrologic	Located adjacent to onsite stream. Live storage capacity is low; therefore, hydrologic functions are limited to minor reductions of surface flows during storm events.		
Habitat	Wildlife habitat functions provided by the wetland may include mammal forage and cover and small bird forage and nesting.		
Buffer Condition	The buffer surrounding the wetland is dominated by native plant species, predominately western sword fern, vine maple, western red cedar, and western hemlock.		

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).

B. Kitsap County Code (19.800.210).

C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).

D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations

E. Brinson, M. M. (1993).

Table 10. Wetland I Summary.

WETLAND I - INFORMATION SUMMARY			
Location:	Located south and across the proposed road from Wetland G		
		**Local Jurisdiction**	Kitsap County
		WRIA	15
		Ecology Rating[A]	IV
		Kitsap County Rating[B]	IV
		Kitsap County Buffer Width[C]	40 feet
		Estimated Wetland Size	1,873 sf (0.04 acre)
		Cowardin Classification[D]	PSSB
		HGM Classification[E]	Slope
		Wetland Data Sheet(s)	SP-20
		Upland Data Sheet (s)	SP-21
		Boundary Flag color	Orange
Dominant Vegetation	Wetland I is dominated by salmonberry, devil's club, and piggyback plant.		
Soils	Ragnar Fine Sandy Loam		
Hydrology	Saturation due to seeps.		
Rationale for Delineation	Areas of well-defined surface saturation and hydrophytic vegetation. Upland areas were determined by topographic rise and predominance of upland plant species, predominately western sword fern and western red cedar.		
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.		
Wetland Functions Summary			
Water Quality	The partially vegetated wetland has limited potential to retain sediments and pollutants from any unknown stormwater runoff and pollutant sources.		
Hydrologic	Located adjacent to onsite stream. Live storage capacity is low; therefore, hydrologic functions are limited to minor reductions of surface flows during storm events.		
Habitat	Wildlife habitat functions provided by the wetland may include mammal forage and cover and small bird forage and nesting.		
Buffer Condition	The buffer surrounding the wetland is dominated by native plant species, predominately western sword fern, vine maple, western red cedar, and western hemlock.		

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).
B. Kitsap County Code (19.800.210).
C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).
D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations
E. Brinson, M. M. (1993).

Table 11. Wetland J Summary.

WETLAND J - INFORMATION SUMMARY			
Location:	Located south and across the proposed road from Wetland H		
		**Local Jurisdiction**	Kitsap County
		WRIA	15
		Ecology Rating[A]	III
		Kitsap County Rating[B]	III
		Kitsap County Buffer Width[C]	60 feet
		Estimated Wetland Size	1,351 sf (0.03 acre)
		Cowardin Classification[D]	PEMC
		HGM Classification[E]	Depressional
		Wetland Data Sheet(s)	SP-22
		Upland Data Sheet (s)	SP-23
		Boundary Flag color	Orange
Dominant Vegetation	Wetland J is dominated by water parsley and bulrush.		
Soils	Ragnar Fine Sandy Loam		
Hydrology	Areas of seasonal saturation.		
Rationale for Delineation	Areas of well-defined hydric soils and hydrophytic vegetation. Upland areas were determined by topographic rise and predominance of upland plant species, predominately western swordfern and western red cedar.		
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.		
Wetland Functions Summary			
Water Quality	The partially vegetated wetland has limited potential to retain sediments and pollutants from any unknown stormwater runoff and pollutant sources.		
Hydrologic	Live storage capacity is moderate; therefore, hydrologic functions are limited to minor reductions of surface flows during storm event.		
Habitat	Wildlife habitat functions provided by the wetland may include mammal forage and cover and small bird forage and nesting.		
Buffer Condition	The buffer surrounding the wetland is dominated by native plant species, predominately western swordfern, big leaf maple and western red cedar.		

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).
B. Kitsap County Code (19.800.210).
C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).
D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations
E. Brinson, M. M. (1993).

Table 12. Wetland K/L Summary.

WETLAND K/L - INFORMATION SUMMARY		
Location:	Located near the railroad right-of-way and in the southwestern corner of the property	
	**Local Jurisdiction**	Kitsap County
	WRIA	15
	Ecology Rating[A]	III
	Kitsap County Rating[B]	III
	Kitsap County Buffer Width[C]	110 feet
	Estimated Wetland Size	95,805 sf (2.20 acres)
	Cowardin Classification[D]	PFO/SS/EMH/E
	HGM Classification[E]	Depressional-Outflow
	Wetland Data Sheet(s)	SP-25
	Upland Data Sheet (s)	SP-26, SP-28
	Boundary Flag color	Orange
Dominant Vegetation	The wetland is dominated by slough sedge with salmonberry and lady fern.	
Soils	Ragnar Fine Sandy Loam	
Hydrology	Areas of seasonal saturation and/or permanent inundation due to stormwater runoff from upland areas.	
Rationale for Delineation	Areas of well-defined surface saturation, inundation and hydrophytic vegetation. Upland areas were determined by topographic rise and predominance of upland plant species, predominately western sword fern and western red cedar.	
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.	
Wetland Functions Summary		
Water Quality	Wetlands K and L have the functional ability to retain sediments and pollutants from stormwater runoff associated with the upland powerlines and railroads.	
Hydrologic	Storage capacity is moderate to high due to the larger wetland size; therefore, hydrologic functions are limited to water storage and retention.	
Habitat	Wildlife habitat functions provided by the wetland may include mammal forage and cover, small bird forage and nesting, and amphibian reproduction.	
Buffer Condition	The buffer surrounding the wetland is dominated by native plant species, predominately western swordfern, big leaf maple and western hemlock. The buffer is substantially impacted by adjacent easement and right-of-way areas, to the northwest, associated with railroad and power line infrastructure and quarry facilities. The buffer in these areas provides some screening of the wetland from outside disturbances.	

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).
B. Kitsap County Code (19.800.210).
C. Recommended wetland buffer width for high intensity use according to Kitsap County Code (19.200.220).
D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations
E. Brinson, M. M. (1993).

Soils

The Natural Resource Conservation Service's (NRCS) Soil Survey of Kitsap County, Washington identifies nine soil series present on or near the subject property (McMurphy, 1980). A band of Norma fine sandy loam (37) was the only hydric soil identified on-site and was identified running through the central portion of the subject property. Soil descriptions are provided below and the NRCS Soil Map is located in Appendix B4.

2 - Alderwood Very Gravelly Sandy Loam, 6 to 15 percent slopes. This moderately deep, moderately well drained soil is located on broad uplands and formed in glacial till. Typically, the surface of this soil is covered by a mat of undecomposed needles and wood fragments. The subsurface layer is brown very gravelly sandy loam 1/2 inch thick. The subsoil is brown very gravelly loam about 21 inches thick. The substratum to a depth of 60 inches or more is grayish brown gravelly sandy loam that is weakly-silica-cemented in the upper part. Depth to the silica-cemented hardpan ranges from 20 to 40 inches. Alderwood Very Gravelly Sandy Loam, 6 to 15 percent slopes, is not listed as hydric on the Kitsap County Hydric Soil List.

5 - Belfast Loam. This deep, moderately well drained soil is located on flood plains and formed in stratified alluvium. Most areas are long and narrow. Slopes are 0 to 2 percent. Native vegetation is mainly a mixture of hardwoods, conifers, and shrubs. Typically, the surface layer is very dark brown loam about 5 inches thick. The upper part of the underlying layer is olive gray fine sandy loam about 17 inches thick. The lower part of the underlying layer is stratified dark brown and dark yellowish brown fine sandy loam and silt loam to a depth of 60 inches or more. In some pedons, the lower part of the underlying layer is sandy loam or gravelly loamy sand. Iron stains are common in root channels. Belfast Loam is not listed as hydric on the Kitsap County Hydric Soil List.

10 - Dystric Xerorthents, 45 to 70 percent slopes. These deep, moderately well drained to somewhat excessively drained soils are located on sidewalls of river valleys and sidewalls of entrenched streams. These soils formed mainly in glacial till, but some formed in sandy and gravelly outwash. Areas are long and narrow on the contour. Most slopes are about 65 percent. The vegetation is conifers and hardwoods. Typically, this soil has a mat of undecomposed needles and wood fragments over a surface layer of dark yellowish brown very gravelly sandy loam about 10 inches thick. The upper part of the underlying material is dark brown, brown, and dark yellowish brown very gravelly sandy loam about 40 inches thick. The lower part of the underlying material to a depth of 60 inches is dark grayish brown and grayish brown very gravelly sandy loam and very gravelly loamy sand. Dystric Xerorthents, 45 to 70 percent slopes, is not listed as hydric on the Kitsap County Hydric Soil List.

26 - Kilchis Very Gravelly Sandy Loam, 30 to 70 percent slopes. This shallow, well-drained soil is located on ridge crests and side slopes and formed in residuum from basalt. Typically, the surface layer is dark reddish brown very gravelly sandy loam about 5 inches thick. The subsoil is dark reddish brown extremely gravelly loam about 14 inches thick over fractured basalt. Depth to the basalt ranges from 16 to 20 inches. Kilchis Very Gravelly Sandy Loam, 30 to 70 percent slopes, is not listed as hydric on the Kitsap County Hydric Soil List.

27 - Kilchis-Shelton Complex, 30 to 70 percent slopes. The soils of this complex are located on ridge crests, site slopes, moraines, and till plains of uplands. The soils formed in material weathered from basalt or glacial till. The Kilchis soil is shallow and well drained. It is on ridge crests and side slopes and formed in material weathered from basalt. Typically, the surface layer is dark reddish brown very gravelly sandy loam about 5 inches thick. The subsoil is dark reddish brown extremely gravelly loam about 14 inches thick over fractured basalt. Depth to basalt ranges from 16 to 20

inches. The Shelton soil is moderately deep and moderately well drained. It is located on moraines and till plains and formed in glacial till. Typically, the surface is covered by a mat of needles, leaves, and wood fragments. The subsoil is dark reddish brown and dark brown very gravelly sandy loam about 25 inches thick. The substratum is weakly-silica-cemented, very compact glacial till to a depth of 60 inches or more. Kilchis-Shelton Complex, 30 to 70 percent slopes, is not listed as hydric on the Kitsap County Hydric Soil List.

35, 36 - Neilton Gravelly Loamy Sand, 3 to 15 and 15 to 30 percent slopes. This deep, excessively drained soil is on terraces, benches, and uplands. It formed in stratified, gravelly and sandy glacial outwash. Typically, the surface layer is dark brown gravelly loamy sand about 4 inches thick. The subsoil is brown very gravelly loamy sand about 15 inches thick. The substratum to a depth of 60 inches is very gravelly sand. Neither Neilton Gravelly Loamy Sand, 3 to 15 percent slopes or 15 to 30 percent slopes, is listed as hydric on the Kitsap County Hydric Soils List.

37 - Norma Fine Sandy Loam. This deep, poorly drained soil is located on long, narrow stream bottoms and on till plain depressions in the uplands. This soil formed in mixed glacial alluvium. Slopes are mainly 0 to 3 percent. Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is distinctly mottled, light olive brown fine sandy loam about 14 inches thick. The substratum to a depth of 60 inches is mottled, olive gray and dark yellowish brown stratified sandy loam, clay loam, and loamy sand. Norma Fine Sandy Loam is listed as hydric on the Kitsap County Hydric Soils List.

38 - Pits. This miscellaneous area is open pits from which gravel and sand have been excavated. Most gravel pits are in areas of Kilchis, Schneider, Neilton, Grove, Indianola, and Ragnar soils, and a few are in Alderwood soils. The excavated gravelly material and some sandy material is used mainly for road construction and ballast.

46 - Ragnar Fine Sandy Loam, 15 to 30 percent slopes. This deep, well-drained soil is located on terraces and uplands and formed in glacial outwash. Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsoil is dark yellowish brown fine sandy loam about 17 inches thick. The substratum to a depth of 60 inches is grayish brown and light brownish gray loamy sand. Ragnar Fine Sandy Loam is not listed as hydric on the Kitsap County Hydric Soils List. The NRCS Soil Survey Map of the project site is located in Appendix B4.

Vegetation

Vegetation communities vary between each of the wetlands identified. Wetland A has a vegetation community consisting of largely shrub and herbaceous species such as unidentified grasses and skunk cabbage. Inundated portions of the wetland are bounded by red alder. Wetland B has a vegetation community consisting of a perimeter of facultative vegetation (western red cedar, red alder), and internal portions of this wetland have sparse coverage of obligate herbaceous vegetation (grasses, sedge, and skunk cabbage) as well as stressed trees inundated by beaver activity. Wetland C is comprised primarily of a canopy of red alder and Scouler's willow with an understory dominated by salmonberry and skunk cabbage. Adjacent to Kitsap Creek this wetland transitions to a more emergent plant community of various unidentified grasses, duckweed and skunk cabbage. Wetland D has a vegetation community consisting of an over story of primarily big leaf maple with minor portions of red alder and western hemlock. The shrub and herbaceous layer contains buttercup, salmonberry, lady fern, and bracken fern. Wetland E has red alder over salmonberry and patchy piggyback. Wetland F has a vegetation community consisting of a dense red alder canopy with an understory of dominated by salmonberry over patchy piggyback plant. Wetland G also has a canopy of red alder over salmonberry and piggyback plant. Wetland H is dominated by salmonberry

and piggyback plant. Vegetation in Wetland I includes devils club, salmonberry, and piggyback plant. Wetland J is dominated by water parsley and bulrush. Wetland K/L has vegetation consisting of slough sedge, salmonberry, and lady fern.

Hydrophytic vegetation communities contained greater than 50 percent obligate, facultative wetland, and/or facultative dominant species and/or scored a prevalence index of less than 3.0.

Hydrology

Hydrologic support for all wetlands identified is provided by direct precipitation, seeps and surface runoff from upland areas adjacent to the wetlands. In addition, substantial hydrologic support for Wetlands A, B, C, E, F, G, and H is predominantly provided by a perennial stream which runs through each wetland.

Indicators of wetland hydrology observed within the wetlands included surface water, saturated soils, water marks, thick dark surface, high water table, saturation, drainage patterns, water-stained leaves, FAC-neutral test, histic epipedon, depleted matrix, and histosols.

4.2.2 Wetland Functions

The wetlands on or near the subject property have variable abilities to provide several water quality and hydrologic functions, such as stormwater retention and infiltration, limited removal of nutrients and toxic compounds, and erosion control and sediment removal. Wetlands A, B, and C are located downstream of an existing stormwater facilities on-site and likely provide additional secondary treatment to stormwater exiting the quarry site. Wetland D appears to have been excavated to provide detention and supply water to the quarry operation as evidenced from pipes located within the pond. Wetlands E through K/L are all located in undeveloped areas upstream of the existing mine and thus have limited opportunity to provide water quality functions, but they may still provide some beneficial hydrologic functions such as flow attenuation after storm events. Wildlife habitat functions provided by the wetlands may include salmonid rearing habitat, small bird foraging and nesting, small and large mammal forage and cover.

Table 13. Functions and Values of Existing Wetlands.

Function / Value[A]	Wetland										
	A	B	C	D	E	F	G	H	I	J	K/L
Water Quality Functions											
Sediment Removal	+	+	+	+	x	x	x	x	x	x	+
Nutrient and Toxicant Removal	+	+	+	x	x	x	x	x	x	x	+
Hydrologic Functions											
Flood Flow Alteration	+	+	x	x	x	-	-	-	-	x	+
Erosion Control and Shoreline Stabilization	-	-	-	-	-	-	-	-	-	-	-
Habitat Functions											
Production and Export of Organic Matter	+	+	+	+	+	x	x	x	x	x	x
General Habitat Suitability	+	+	x	+	+	+	+	+	+	+	+
Habitat for Aquatic Invertebrates	+	+	+	+	+	+	+	+	+	+	+
Habitat for Amphibians	+	+	+	+	+	+	+	+	+	+	+
Habitat for Wetland-Associated Mammals	+	+	+	+	+	x	x	x	x	x	x
Habitat for Wetland-Associated Birds	+	+	+	+	+	-	-	-	-	-	x
General Fish Habitat	+	+	x	-	+	+	+	+	-	-	-
Native Plant Richness	+	+	x	x	+	x	x	x	x	x	+
Special Characteristics											
Educational or Scientific Value	x	x	-	-	x	-	-	-	-	-	-
Uniqueness and Heritage	+	+	-	-	x	-	-	-	-	-	-

A: "-" means that the function is not present; "x" means that the function is of lower quality; and "+" means the function is of higher quality.

4.2.3 Wetland Buffer

Based on the wetland classification guidelines in the KCC Title 19.200 and the WSDOE wetland rating system, the proposed project area contains four Category IV wetlands, six Category III wetlands, and one Category II wetland. Under KCC 19.200.220(A), Category IV wetlands are subject to a 30-foot base buffer width, Category III wetlands are subject to a 50-foot base buffer width, and Category II wetlands are subject to a 100-foot base buffer width. However, as the proposed project meets the criteria of "High Impact" and "Moderate Impact" land uses under KCC 19.200.220(B), the buffer widths listed in Tables 1 – 12 are derived from the land-use designation of the proposed project along with the wetland ratings and corresponding habitat scores (per KCC Table 19.200.220 (C), KCC Table 19.200.220 (D), and KCC Table 19.200.220 (E)). Wetlands A through D were considered to be subject to high-intensity land use due proximity to the Kitsap

Quarry mine. However, Wetlands E through K/L will only be adjacent to transportation roads for the UTF mines and should be reviewed under moderate-intensity land use.

4.3 Fish and Wildlife Habitat

4.3.1 Overview

The site investigation identified four aquatic features (streams) within the vicinity of the subject property, one of which provides identifiable salmonids. One perennial fish-bearing stream was identified outside the project area to the northwest (Kitsap Creek/Drainage X), and three unnamed ephemeral/seasonal drainages (Drainages W, Y, and Z) were identified in the western and eastern portions of the assessment area. Drainage Z is located in the eastern portion of the site within the City of Bremerton. All other drainages are located in the western portion of the site in Kitsap County.

Direct connectivity of Drainage Z to Kitsap Creek was unconfirmed due to lack of access on private property; however, such connectivity is likely, and Drainage Z is referred to herein as an unnamed tributary to Kitsap Creek. Drainage Z was further identified as a Type Ns water body on-site. Kitsap Creek/Drainage X and Drainages W and Y are tributaries of Kitsap Creek. Drainage W is likely Type F. Drainage Y is Type Ns due to a steep mucky slope. Tables 14-17 and Section 4.3.3 provide a summary and discussion of the drainage.

In addition, the site contains habitat features identified during the assessment, such as standing snags and mature trees and dense shrub cover in most places, notable for use by priority avian and mammal species. Several tree snags of various conifer and deciduous species that could provide forage areas and shelter for avian species were identified onsite in addition to the delineated wetlands. Aquatic habitats were observed to contain both various amphibians, water-fowl and small mammals. Small passerine bird nests and Douglas squirrel (*Tamiasciurus douglasii*) nests were identified throughout the subject property along with evidence of black bear (*Ursus americanus*), beaver (*genus Castor*), black-tailed deer (*Odocoileus hemionus*). Observed evidence included scat, foot prints, scratched trees, beaver dams, cut trees, and dens. Considering the subject property borders an existing residential community, it is also likely habitat for more opportunistic species such as coyotes (*Canis latrans*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), voles and mice, among others.

WDFW's Priority Habitats and Species (PHS) database lists cutthroat trout occurrence and migration, coho occurrence and breeding and Steelhead occurrence and migration all within Kitsap Creek; Great blue heron breeding in the lower sections of Kitsap Creek; Osprey occurrence within a quarter mile; and Lacustrine littoral and palustrine habitat all within the vicinity of the project. Juvenile salmonids were observed in Kitsap Lake during site investigations. Potentially suitable forest and aquatic habitats were documented and are described in the following sections. A WDFW PHS map of the site and an associated table can be found in Appendix B5 of this report.

4.3.2 Kitsap Creek (Drainage X)

Kitsap Creek flows (Drainage X) northerly and easterly from Wetland I and adjacent upland areas off-site through the existing mine access road into Wetland E. Many portions of the stream investigated were heavily encumbered by beaver activity. Three distinct breaks at beaver dams were identified creating natural elevation and hydrologic breaks between the wetlands forming partial fish passage barriers.

WDFW identifies priority fish presence in Kitsap Creek which runs through the subject property. Priority species listed in Kitsap Creek include Coho salmon, fall chum salmon, rainbow trout, resident cutthroat trout, and winter steelhead trout (WDFW, 2009 and 2011a). Juvenile salmonid presence was visually confirmed east of the existing gravel access road. Fish presence west of this point was not confirmed but likely terminates at existing culverts that have been identified for replacement with the proposed road extension.

Table 14. Stream Information Summary – Kitsap Creek (Drainage X).

STREAM INFORMATION SUMMARY		
	**Stream Name**	Kitsap Creek (Drainage X)
	WRIA	15
	WA Stream Catalog #	NA
	Local Jurisdiction	Kitsap County
	DNR Stream Type	Type F
	Local Stream Rating	Type F
	Buffer Width	150 feet
	Documented Fish Use	Juvenile salmonid presence visually confirmed.
Location of Stream	Located outside the subject property to the northwest.	
Connectivity (where stream flows from/to)	Enters the vicinity of the subject property from adjacent off-site upland areas to the west and meander northeasterly until it reaches Kitsap Lake.	
Riparian/Buffer Condition	Relatively undisturbed buffer except where interrupted by the existing mine access road and stormwater facilities.	

4.3.3 Drainage W

Drainage W begins within Wetland K/L and flows immediately under a private road through a culvert and east and into Kitsap Creek (Drainage X). Within the subject property, the drainage runs west to east and covers approximately 474 lineal feet (Appendix C).

The western portion of Drainage W is a wide swale; no hydrology was observed in the upper western half of the channel during the February site visit. Due to the seeps within the channel and adjacent wetlands, hydrology was observed in the lower eastern half of the channel which is narrower (1 to 1.5 feet in width) and deeper (approximately 1.5 feet deep) than the upper portion. Sediments were silt and cobble, small riffles are present in lower portions. Riparian vegetation includes Himalayan blackberry, reed canary grass in areas adjacent to Wetland K/L and lower portions contain salmonberry, piggyback, swordfern and minor amounts of devils club. While no fish were identified during the site visit, a moderate quality of fish habitat elements were present in the lower reaches of the channel. Table 15 provides a detailed summary of this drainage.

Table 15. Stream Information Summary – Drainage W.

STREAM INFORMATION SUMMARY		
	**Stream Name**	Drainage W
	WRIA	15
	WA Stream Catalog #	NA
	Local Jurisdiction	Kitsap County
	DNR Stream Type	Type F
	Local Stream Rating	Type F
	Buffer Width	150 feet
	Documented Fish Use	No
Location of Stream	Runs west to east through the subject property. See Appendix C for site map.	
Connectivity (where stream flows from/to)	The drainage is likely tributary to Kitsap Creek and is most likely fed by groundwater seeps and adjacent wetlands.	
Riparian/Buffer Condition	Within the subject property the buffer is relatively undisturbed with the exception of the portions of the reach near the power line corridor and where an access road crosses the channel. The buffer is generally dominated by a canopy of western red cedar, hemlock, and Douglas fir with an understory of swordfern and salmonberry.	

4.3.3 Drainage Y

Drainage Y begins within Wetland E and is further than 300 feet from the proposed road crossing. Within the subject property, the drainage runs west to east and covers approximately fifty (50) linear feet (Appendix C).

Drainage Y is primarily an incised erosional channel with ephemeral flows approximately 2.5 feet wide and 10 inches deep. The drainage originates from a seep and drains into Kitsap Creek (Drainage X). Substrates are silt and muck and riparian vegetation includes salmonberry, tolmea and sword fern. No fish habitat was identified within Drainage Y due to steep slopes and mucky substrates. Table 16 provides a detailed summary of this drainage.

Table 16. Stream Information Summary – Drainage Y.

STREAM INFORMATION SUMMARY		
	**Stream Name**	Drainage Y
	WRIA	15
	WA Stream Catalog #	NA
	Local Jurisdiction	Kitsap County
	DNR Stream Type	Type Ns
	Local Stream Rating	Type Ns
	Buffer Width	50 feet
	Documented Fish Use	No
Location of Stream	Runs west to east through the subject property. See Appendix C for site map.	
Connectivity (where stream flows from/to)	The drainage flows into Drainage X and is likely tributary to Kitsap Creek. It is fed by groundwater seeps and Wetland E.	
Riparian/Buffer Condition	The buffer is undisturbed and is generally dominated by a canopy of big leaf maple and western hemlock with an understory of swordfern, salmonberry and tolmea.	

4.3.4 Drainage Z

Drainage Z begins off-site to southeast of the subject property. Within the subject property, the drainage runs south to north and covers approximately 1,320 lineal feet (Appendix C).

On-site, Drainage Z is primarily a deeply incised erosional channel with intermittent ephemeral flows approximately 4 feet wide by 1 ¾ feet deep. However, a narrow section of Drainage Z, associated with an old access road crossing, creates a portion of the reach with abnormal characteristics, exhibiting significantly less incision. No fish habitat was identified within Drainage Z due to steep slopes downstream of the proposed activity, limited flows, and no identified upstream refugia. Table 17 provides a detailed summary of this drainage. Unlike Kitsap Creek (Drainage X) and Drainages W and Y, Drainage Z is subject to regulation by the City of Bremerton and not regulation under KCC.

Table 17. Stream Information Summary – Drainage Z.

STREAM INFORMATION SUMMARY		
	**Stream Name**	Drainage Z
	WRIA	15
	WA Stream Catalog #	NA
	Local Jurisdiction	City of Bremerton
	DNR Stream Type	Type Ns
	Local Stream Rating	Type Ns
	Buffer Width	35 feet
	Documented Fish Use	No
Location of Stream	Runs south to north through the subject property. See Appendix C for site map.	
Connectivity (where stream flows from/to)	The drainage is likely tributary to Kitsap Creek and is most likely fed by groundwater seeps and stormwater runoff from adjacent industrial/commercial sites.	
Riparian/Buffer Condition	Within the subject property the buffer is generally undisturbed with the exception of the portions of the reach near the power line corridor. The buffer is generally dominated by a canopy of red alder, western red cedar and Douglas fir with an understory of swordfern and salal.	

4.3.4 Stream Buffers

Based on the definitions contained within the KCC Title 19, including the stream classification guidelines in Table 19.300.310- *DNR Water Typing System*, and KCC Title 19.800 Appendix B- *Washington State Department of Natural Resources Stream Typing System*, Kitsap Creek (Drainage X) and Drainage W are Type F waterbodies which require 150-foot protective buffers from OHW plus a minimum building setback of 15 feet from the buffers.

Based on the definitions contained within the KCC Title 19, including the stream classification guidelines in Table 19.300.310- *DNR Water Typing System*, and KCC Title 19.800 Appendix B-

Washington State Department of Natural Resources Stream Typing System, Drainage Y is a Type Ns waterbody which requires a 50-foot protective buffer from OHW plus a minimum building setback of 15 feet from the buffers.

Based on the definitions contained within the BMC Title 20, including the stream classification guidelines in Table 20.14.140, and BMC Title 20.14.720, Drainage Z is a Type Ns waterbody which requires a 35-foot protective buffer from the OHW plus a minimum building setback of 15 feet from the buffer.

Chapter 5. Habitat Management Plan

As the proposed project requires impacts to potentially regulated fish and wildlife habitat, a Habitat Management Plan (HMP) is required under KCC Title 19 and under BMC Title 20. The following sections present the proposed HMP for the UTF/Kitsap Quarry – Private Access Road. This plan has been incorporated into this wetland and fish and wildlife habitat assessment for the proposed project to avoid redundancy and has been presented in a manner appropriate to the minor impacts being proposed. The proposed drainage impacts and mitigation actions attempt to closely adhere to local Critical Areas Regulations specified in KCC 19.300 and BMC 20.14.700. No wetland fill is proposed at this time, if fill is proposed in the future, the project will need to comply with National and Regional Conditions for State and Federal authorization of fill under the 2012 Nationwide Permit (NWP) 18 (Minor Discharges), and/or fish and wildlife habitat improvement projects under Nationwide Permit (NWP) 27, as required under Sections 401 and 404 of the Clean Water Act (CWA).

Potential compensatory drainage mitigation actions were examined in the context of mitigation sequencing and watershed-level processes as required by Federal compensatory mitigation rules (USACE 33 CFR Parts 325 and 332, EPA 40 CFR Part 230), State stream mitigation guidance (WDFW, 2000 and WDFW, 2003), and RCW 90.48, and locally under standards set forth in KCC 19.200.250 and BMC 20.14.750. The proposed plan seeks to maintain functions on-site at Drainages W, X, and Z road crossings. This HMP addresses issues as they relate to the proposed project including managing flows and sediment transportation as well as replanting disturbed areas.

5.1 Code Analysis

The following section explores Kitsap County Code to ensure the proposed project will comply with all relevant county code.

19.200.220 Wetland buffer requirements.

C. Modification of Buffer Widths. Modifications to buffer widths may be considered provided that mitigation sequencing is first demonstrated to first avoid, then minimize, and as a last resort, mitigate for unavoidable reductions or alterations to the required wetland buffers.

1. Buffer Decrease Sequencing. Demonstration of unavoidable modifications to wetland buffers shall be implemented through the following methods:

a. Buffer Averaging. Standard buffer widths may be modified by the department for a development proposal by averaging buffer widths. The total area contained within the buffer after averaging shall be no less than that contained within the standard buffer prior to averaging. The buffer shall not be reduced by more than 50 percent of the standard buffer width at any point. The department may allow wetland buffer averaging where it can be demonstrated that such averaging can clearly provide as great or greater functions and values as would be provided under the standard buffer requirement. The following standards shall apply to buffer averaging:

(1) The decrease in buffer width is minimized by limiting the degree or magnitude of the regulated activity.

(2) For wetlands and/or required buffers associated with documented habitat for endangered, threatened, or sensitive fish, or wildlife species, a habitat assessment report has been submitted that demonstrates that the buffer modification will not result in an adverse impact to the species of study.

(3) Width averaging will not adversely impact the wetland.

(4) The total buffer area after averaging is no less than the buffer area prior to averaging.

(5) The minimum buffer width will not be less than 50 percent of the widths established after the categorization is done and any buffer adjustments applied.

(6) If buffer width averaging is utilized and significant trees are identified on the outer edge of the reduced buffer such that their drip line extends beyond the buffer edge, the following tree protection requirements must be followed:

i. A tree protection area shall be designed to protect each tree or tree stand during site development and construction. Tree protection areas may vary widely in shape, but must extend a minimum of five feet beyond the existing tree canopy area along the outer edge of the dripline of the tree(s), unless otherwise approved by the department.

ii. Tree protection areas shall be added and clearly labeled on all applicable site development and construction drawings, submitted to the department.

iii. Temporary construction fencing at least 30 inches tall shall be erected around the perimeter of the tree protection areas prior to the initiation of any clearing or grading. The fencing shall be posted with signage clearly identifying the tree protection area. The fencing shall remain in place through site development and construction.

iv. No clearing, grading, filling or other development activities shall occur within the tree protection area, except where approved in advance by the department and shown on the approved plans for the proposal.

v. No vehicles, construction materials, fuel, or other materials shall be placed in tree protection areas. Movement of any vehicles within tree protection areas shall be prohibited.

vi. No nails, rope, cable, signs, or fencing shall be attached to any tree proposed for retention.

vii. The department may approve the use of alternate tree protection techniques if an equal or greater level of protection will be provided.

As the proposed project impacts wetland buffers within the project area the proposed project seeks to avoid wetland buffer impacts wherever possible and to minimize unavoidable impacts. However, minor impacts to buffers associated with Wetlands E, J, and K/L are expected. To mitigate for unavoidable wetland buffer impacts, this project proposes to utilize buffer averaging to ensure the total wetland buffer area will remain unchanged after the proposed project has been completed. At no point will the wetland buffer be reduced by more than fifty (50) percent of the standard buffer width outlined in KCC. Averaging the width of the wetland buffer will not adversely impact the wetlands and will provide the same functions and values provided by the wetland buffer prior to wetland buffer averaging. No significant trees have been identified on the outer edge of the reduced buffer.

KCC 19.200.225 Additional development standards for regulated uses.

In addition to meeting the development standards of this chapter, those regulated uses identified below shall also comply with the standards of this section and other applicable state, federal and local ordinances.

D. Road/Street Repair and Construction. Any private or public road or street repair, maintenance, expansion or construction which is allowed shall comply with the following minimum development standards:

1. No other reasonable or practicable alternative exists and the road or street serves multiple properties whenever possible;

2. Publicly owned or maintained road or street crossings should provide for other purposes, such as utility crossings, pedestrian or bicycle easements, viewing points, etc.;

3. The road or street repair and construction are the minimum necessary to provide safe roads and streets; and

4. Mitigation shall be performed in accordance with specific project mitigation plan requirements.

Pursuant to KCC 19.200.225 D, road construction is permissible within the wetland buffer area so long as construction complies with the stipulations outlined within the code. An alternative placement of the proposed road has been explored in this report to reaffirm the preferred road placement described here within. As the proposed road is a private road, Item 2 does not apply to this situation. The proposed road will be designed and maintained to ensure safety. Mitigation for any impacts to wetland buffer will be in accordance with the wetland mitigation plan requirements specific to this type of project. As all on-site wetlands are being avoided no compensatory wetland mitigation or mitigation plan is necessary. As the proposed project already has approval for part of

the project from the City of Bremerton and the project is proposed in an area that has already been impacted, the proposed project will minimize new impacts to the area. To the extent applicable, this report has been prepared in compliance with KCC 19.700.715.

19.300.315 Development standards.

A designated fish and wildlife habitat conservation area with its buffer is subject to the regulatory provisions of this chapter. Those regulated uses identified below within designated fish and wildlife habitat conservation areas shall comply with the performance standards outlined in this chapter.

D. Stream Crossings. Any private or public road expansion or construction which is allowed and must cross streams classified within this title, shall comply with the following minimum development standards:

1. Bridges or bottomless culverts shall be required for all Type S or F streams that have salmonid breeding habitat. Other alternatives may be allowed upon submittal of a habitat management plan that demonstrates that other alternatives would not result in significant impacts to the fish and wildlife conservation area, as determined appropriate through the Washington State Department of Fish and Wildlife (WDFW), Hydraulic Project Approval (HPA) process. The plan must demonstrate that salmon habitat will be replaced on a 1:1 ratio.

2. Crossings shall not occur in salmonid spawning areas unless no other feasible crossing site exists. For new development proposals, if existing crossings are determined to adversely impact salmon spawning or passage areas, new or upgraded crossings shall be relocated as determined by the Washington State Department of Fish and Wildlife.

3. Bridge piers or abutments shall not be placed in either the floodway or between the ordinary high water marks unless no other feasible alternative placement exists.

4. Crossings shall not diminish flood carrying capacity.

5. Crossings shall serve multiple properties whenever possible.

6. Where there is no reasonable alternative to providing a culvert, the culvert shall be the minimum length necessary to accommodate the permitted activity.

Stream crossings are permissible in Kitsap County provided the crossings comply with minimal development standards described within KCC 19.300.315 D. The project proposes utilizing box culverts at all stream crossing locations to allow for unobstructed fish and wildlife passage. The stream crossings proposed herein shall not occur in salmonid spawning habitat, furthermore, existing crossings non-functional culverts within the proposed project area will be replaced with appropriately-sized box culverts. The proposed project has been carefully designed so that no bridge piers or abutments shall be placed in the floodway or OHW. In addition, flood storage capacity will not be diminished and the culverts shall be the minimum length necessary to accommodate the proposed road.

12.18.130 Wetlands protection (minimum requirement No. 8).

1. Discharges to wetlands shall maintain the hydrologic conditions, hydrophytic vegetation, and substrate characteristics necessary to support existing and designated uses. The hydrologic analysis shall use the existing land cover condition to determine the existing hydrologic conditions unless directed otherwise by a regulatory agency with jurisdiction.

2. Storm water treatment and flow control facilities shall not be built within a natural vegetated buffer, except for:

(a) Necessary conveyance systems as approved by the permittee; or

(b) As allowed in wetlands approved for hydrologic modification and/or treatment in accordance with Guidesheet 1B in Appendix I-D of the Stormwater Management Manual for Western Washington (2005).

3. An adopted and implemented basin plan prepared in accordance with the provisions of Section 12.20.130 may be used to develop requirements for wetlands that are tailored to a specific basin.

The proposed project includes four (4) stormwater detention facilities, two of which will be located within an interrupted section of wetland buffers. In accordance with KCC 12.18.130 item (b) stormwater treatment and flow control facilities may be built within a natural vegetated wetland buffer except as described by Guidesheet 1B in Appendix I-D of the Stormwater Management Manual for Western Washington (2005). The interrupted wetland buffers that may be impacted by

the installation of the proposed stormwater facilities are of Wetlands E and Wetlands K/L. Neither Wetland E nor Wetland K/L provide rare, threatened, or endangered species habitat. Although Wetland E is a Category III wetland, the area of wetland buffer in which the proposed stormwater facility is proposed is bisected and interrupted by the proposed road. Wetland K/L is a Category III wetland.

In order for a wetland to be considered for structural or hydrological modification for runoff control a wetland must demonstrate most of the stipulations outlined in Guidesheet I-D, Item 2. Both wetlands have been deprived of significant amounts of their respective water supplies via draining activities, however, stormwater runoff is sufficient to augment the water supply. Construction of the stormwater facilities will disturb very little of either wetland as in both cases, the proposed road interrupts the wetland buffer in which the proposed stormwater facilities are located. Wetlands E and K/L can both provide the required storage capacity through outlet orifice modification. Current existing conditions elicit a high degree of water level fluctuation and a range of water velocities in both wetlands. Neither Wetland E nor Wetland K/L is a forested wetland or a priority peat system that will experience a substantially altered hydroperiod as a result of the proposed stormwater facilities. Furthermore, neither wetland contains unusual biological communities, habitat features of high value, or protected fish species.

The topography and layout of the proposed stormwater facilities will not threaten fish stranding nor does either wetland provide a valued open space for educational, scientific, or recreational opportunities. Wetlands E and K/L will receive greater protection through this stormwater management project. Through the proposed project both wetlands will be enhanced to perform other functions in addition to runoff quantity and quality control. Both wetlands lend themselves to the effective application of the Wetland Protection Guidelines in Guidesheet 2. Wetlands E and K/L each lie in the natural routing of the runoff and allow for runoff discharge at the natural location. Although Wetlands E and K/L meet the majority of stipulations outlined in the Guidesheet, there are two which the wetlands do not meet. Neither wetland is a Category IV wetland nor has either wetland been previously disturbed by human activity.

5.2 Mitigation Sequencing

Access to existing Kitsap Quarry mine operations currently utilizes a private road that exits onto Archie Avenue, continues onto Kitsap Lake Road NW, and then onto Northlake Way NW. The existing route requires using a non-arterial residential road that is not conducive to industrial traffic. On the east side of the subject parcel, Werner Road, an industrially used and maintained arterial, leads directly to State Highway 3. Access to this industrial road can be obtained by constructing a relatively short private access route along portions of a relic logging road from the existing Kitsap Quarry site and has been approved by the City of Bremerton. In addition, access will be necessary from proposed sand, gravel, and basalt mines in UTF to the processing facilities at Kitsap Quarry. Therefore, a new proposed access road is also needed to extend west in order to connect Kitsap Quarry to existing roads in UTF.

Significant portions of the site are encumbered by wetlands, regulated drainages, and their respective buffers. Careful planning efforts are necessary to ensure the proposed road alignment avoids major wetland and stream impacts. Two viable routes were identified for the section of proposed road to connect UTF and Kitsap Quarry. The primary route proposed two stream crossings but would utilize an existing road alignment and would provide replacement of two existing non-functional culverts with two appropriately-sized box culverts. An alternate design proposed only one stream

crossing and had reduced buffer impacts; however, it would not include replacement of existing culverts, and use of the existing unimproved road would remain while proposing all new impacts to the north. After preliminary consultation with WDFW and tribal representatives, the primary route was selected as the least environmentally damaging alternative and is the route selected. This HMP will focus on the primary route option and any critical areas located within three hundred (300) feet on either side of the proposed road improvements.

Any planned improvement of the site will need to consider compensatory mitigation for new impacts to streams or wetlands and associated buffers. At this time, no wetland fill is proposed. If wetland fill must be proposed in the future, joint Federal and State agency guidance (Ecology, 2006) outlines recommended compensatory wetland mitigation standards and ratios. These standards are likely to be required by USACE and WSDOE unless a scientifically viable alternative is presented. These guidance standards for mitigation ratios exceed those outlined in KMC 11.06; therefore, any compensatory wetland mitigation planning should attempt to achieve the higher guidance standards if possible. Additionally, more recent joint USACE and EPA rules (USACE, 2008) and interagency guidance (Hruby, 2009) have been established that require more careful mitigation planning efforts utilizing a watershed approach in site selection, establishment of enforceable performance standards, and preference for use of mitigation banks or in-lieu fees wherever possible.

The preferred route for the proposed road avoids all known wetland impacts and minimizes impacts to onsite drainages to the greatest extent possible. The replacement of the stream crossings will be self-mitigating as the project proposes placement of appropriately-sized box culverts where there are currently non-functional culverts that impede the passage of fish and organic materials. Impacts are further minimized by limiting the extent of the drainage crossings and using appropriate materials and best management practices which are described in detail in Sections 5.3, 5.5 and 5.6. To mitigate for unavoidable impacts to buffers, all areas temporarily impacted by construction of the road will be replanted and seeded with native vegetation which will restore habitat functions and prevent future erosion issues.

5.3 Description of Impacts

While rerouting mining transportation to an industrial arterial road and connecting to existing UTF roads, on-site wetlands and aquatic features and associated buffers will be avoided to the greatest extent possible; however, multiple stream crossings and temporary impacts to stream and wetland buffers will be necessary. Where the stream crossings are proposed. The paved road surface will be 15-foot wide; however, when accounting for road side stormwater swales and the road prism the road will be 25-feet wide. Road construction will likely require a 50 foot corridor/ clearing limit; therefore, a total of 50 linear feet of stream crossing will be required at each of the drainages. Box culverts or bridges will be used for the drainage crossings in the culvert replacement areas to minimize impacts. The City of Bremerton has already approved the crossing of Drainage Z. Existing restrictive culverts in Kitsap County (Drainages X and W) will be removed and crossing areas will be replaced with appropriately-sized box culverts.

Unnecessary impacts to wetlands and drainages are avoided by careful design and location of the road placement. The proposed crossings are designed in coordination with a geologist, forester, and engineer to perform in a manner that will allow for unimpeded continuation of downslope drainage hydrology under the crossing thus helping to protect downstream functions. Two of the proposed crossings will be located on an existing roadway footprint and will involve replacement of two less-

functional culverts, resulting in improved flow. In addition, any disturbed areas and the entire road prism (excluding the roadbed and a maintenance shoulder) will be replanted with native vegetation.

5.3.1 Description of Drainage and Buffer Crossing

As mentioned above, two potentially regulated stream crossings are necessary in order to construct the private road to connect Kitsap Quarry to UTF and to route traffic to an existing industrial arterial road located on the east side of the parcel. All other wetland and aquatic features are avoided. However, the road crossing proposes impacting minor wetland buffer areas associated with Wetlands E, J, and K/L. A total of 958 lineal feet (14,370 square feet) of wetland buffer and 850 lineal feet (12,750 square feet) of stream buffer will be impacted by road constructions. The road placement and necessary grading were designed to minimize stream and buffer impacts within the design standards of both Kitsap County and the City of Bremerton. The primary access road will connect off-site Werner Road along the east edge of the site. Upon entry, the road already approved by the City of Bremerton heads west; after crossing Drainage Z the private road heads southwest to avoid other aquatic features and critical areas and terminates at the quarry. The UTF extension will connect to this approved termination point. As with the previously approved section, the new road bed will be fifteen (15) feet wide and will be surfaced with gravel. An appropriately-sized box culvert will be implemented at each crossing to ensure hydrologic connectivity.

5.4 Mitigation Strategy

The objective of the proposed mitigation actions are to maintain and/or restore hydrological, sediment transport and habitat functions associated with on-site wetlands, drainages, and associated buffer areas. The proposed plantings will restore areas temporarily impacted during construction activities. Buffer averaging will be utilized to mitigate for permanent wetland buffer impacts. In addition, other mechanisms such as culvert size; energy dissipation; the use of rock walls to narrow the road prism at the drainage crossing, and wing walls may be used to minimize impacts and to maintain functional attributes of the drainage. BMPs, including a construction entrance and silt fencing, will be implemented prior to construction activities. In addition, the planting area will be bounded by high visibility fencing during construction to prevent disturbance or trampling. Some impact reduction actions will occur concurrent with drainage crossing construction including installation of energy dissipation mechanism, wing walls and installation of rock walls to minimize road prism within the stretch that crosses the drainage. Plantings and seeding will occur as soon after crossing construction as possible to prevent erosion and maintain and restore habitat functions.

Further, BMPs will include the following: Excess or waste materials will be kept from entering the waterway to the maximum extent possible and all excess or waste materials will be collected and recycled or disposed of at an approved facility. The contractor will comply with water quality restrictions as required by law and implement corrective measures if temporary water quality standards are exceeded; however, no water is expected to be present during construction. Care will be taken to prevent any petroleum products or other toxic or deleterious materials from entering the water. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., will be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills. The contractor will have a spill kit with oil-absorbent materials on-site to be used in the event of a spill or if any oil product is observed. The contractor will be responsible for the preparation of a Spill Prevention, Control, and Countermeasures (SPCC) plan to be used for the duration of the project if required by permitting agencies.

5.5 Mitigation Implementation

5.5.1 Stream Crossing Design and Maintenance of Hydrologic Continuity

Construction of the approved crossing of Drainage Z includes a 15-foot wide gravel roadway (with necessary sloped shoulders) over a proposed box culvert or bridge. The new box culvert will allow for unimpeded continuation of drainage and sediment transport under the crossing in order to protect downstream hydrologic habitat functions of Drainage Z. Final design details of the crossing have been prepared by the Project Engineer and approved by the City of Bremerton.

Construction of the proposed drainage crossings of Drainages W and X (Kitsap Creek) will include removal of two restrictive pipe culverts and replacement with box culverts according to WDFW bankfull width specifications. This action will restore fish access to upstream habitat. All buffer impacts from road construction activities will be replanted with native vegetation. Final details of the crossing will be prepared by the Project Engineer and approved by the Biologist prior to commencement of construction.

5.6 Mitigation Specifications

Due to the need for two drainage crossings and targeted planting actions, coordination with the responsible Biologist will be necessary to properly implement the planned mitigation actions. The project manager and construction contractor shall meet with the Biologist at the site before construction activities commence in order to ensure critical elements are properly addressed, and implementation of the proposed drainage impacts and mitigation actions will be conducted under the oversight of the responsible Biologist and Project Engineer for the duration of the project

The following specifications are established as a set of minimum standards for proper implementation of the mitigation actions. Additional actions, modifications, and/or substitutions may be necessary at the time of construction and may be approved by the responsible Biologist and Project Engineer. No annual monitoring or reporting should be necessary aside from an as-built report because planting goals will likely be met upon construction completion.

5.6.1 Buffer Soils

Soils in buffer areas should be disturbed as little as possible. Grading activities will not occur in buffer areas except where necessary to construct the described roadway. In these areas, the footprint of disturbance will be minimized, and the soils will be restored to natural conditions. Any non-native invasive plant material will be removed prior to such disturbances to avoid redistribution and/or dispersion. Graded buffer areas will have topsoil replaced and/or amended as necessary. Soils will be amended as necessary to provide appropriate conditions for the native plants specified in Table 18.

5.6.2 Erosion Control and Pollution Prevention

Temporary erosion and sediment control (TESC) measures consisting of a construction entrance, silt fencing, seeding of disturbed soils, and brush barriers will be installed using BMP's outlined in the project's Stormwater Pollution Prevention Plan (SWPPP) and TESC Plan prepared by the Project Engineer and approved by the responsible Biologist prior to clearing and grading activities and construction of the drainage crossing.

Equipment used for project actions will be typical for excavation and grading activities and will be kept in good working order free of leaks. All equipment staging and materials stockpiles will be kept

out of wetlands, drainages, and buffers; and the area will be kept free of spills and/or hazardous materials. All fill material and road surfacing will be sourced from upland areas on-site or from approved suppliers, and will be free of pollutants and hazardous materials.

5.6.3 Plant Scheduling, Species, Density, and Location

Plant installation should occur as close to conclusion of clearing and grading activities as possible to limit erosion and limit the temporal loss of function provided by the drainage buffer. All planting should occur between September 1 and May 1 to ensure plants do not dry out after installation, or temporary irrigation measures may be necessary. All planting will be installed according to the procedures detailed in the following subsections using the species and densities outlined in Table 18 below.

Table 18. Plants recommended for the proposed project.

Species Name[1]	Common Name	Minimum Size[2]	Spacing (in feet, on center)	Quantity[4]
Gaultheria shallon	Salal	Bare root	2'o.c. in clumps of 3-5	15%
Holodiscus discolor	Ocean Spray	Bare root	3'-5'o.c.	10%
Polystichum munitum	Sword fern	4"plug	2'o.c. in clumps of 3-5	10%
Rubus spectabilis	Salmonberry	Bare root	3'-5'o.c.	10%
Mahonia nervosa	Oregon grape	Bare root	2'o.c. in clumps of 3-5	10%
Acer macrophyllum	Big leaf maple	Bare root	10'o.c. 1 gal	10%
Oemleria cerasiformis	Indian plum	Bare root	3'-5'o.c.	10%
Pseudosuga menziesii	Douglas fir	Bare root	10'o.c. 1 gal	10%
Acer circinatum	Vine maple	Bare root	3'-5'o.c.	15%
	Native Riparian Seed Mixes[3]	Seed	30 lb per acre	-

1 Scientific names and species identification taken from *Flora of the Pacific Northwest* (Hitchcock and Cronquist, 1973 and Cooke, 1997).
2 Over-sized plants are suitable for replacement.
3 To be approved by project Biologist.
4 As needed to replant disturbed areas.

5.6.3a Replanting of Disturbed Areas

The road prism within the wetland and drainage buffers (excluding the road surface and six (6) feet of shoulder on either side) and any other disturbed areas within these buffers should be replanted with the native species and quantity listed in Table 18. After planting, the entire area will be hand-seeded with a native upland seed mix such as Silver Falls Seed Company, Northwest Woodland Mix # SF 0202-3 at a rate of 30 pounds per acre. This mix typically includes 15 percent blue wildrye (*Elymus glaucus),* Idaho fescue (*Festuca idahoensis),* red fescue *(Festuca rubra),* and California brome (*Bromus carinatus)* and 20 percent large leaf lupine *(Lupinus polyphyllus)* and meadow barley (*Hordeum brachyantherum)* by weight.

5.6.4 Plant Materials and Installation

5.6.4a Plant Materials

All plant materials to be used on the site will be nursery grown stock from a reputable, local source. Only native species are to be used; no hybrids or cultivars will be allowed. Plant material provided will be typical of their species or variety; if not cuttings, they will exhibit normal, densely-developed branches and vigorous, fibrous root systems. Plants will be sound, healthy, vigorous plants free from defects and all forms of disease and infestation.

Any container stock provided in-lieu of specified bare root stock shall have been grown in its delivery container for not less than six months but not more than two years. Plants shall not exhibit rootbound conditions. Under no circumstances shall container stock be handled by their trunks, stems, or tops. Seed mixture used for hand or hydroseeding shall contain fresh, clean, and new crop seed mixed by an approved method.

All plant material shall be inspected by the responsible Biologist upon delivery. Plant material not conforming to the specifications above will be rejected and replaced by the planting contractor. Rejected plant materials shall be immediately removed from the site.

Fertilizer will be in the form of Agroform plant tabs or an approved like form. Mulch will consist of sterile wheat straw or clean recycled wood chips approximately 1/2 inch to 1 inch in size and 1/2 inch thick. If free of invasive plant species, the mulch material may be sourced from woody materials salvaged from the land clearing activities.

5.6.4b Product Handling, Delivery, and Storage

All seed and fertilizer should be delivered in original, unopened, and undamaged containers showing weight, analysis, and name of manufacturer. This material should be stored in a manner to prevent wetting and deterioration. All precautions customary in good trade practice shall be taken in preparing plants for moving. Workmanship that fails to meet industry standards will be rejected. Plants will be packed, transported, and handled with care to ensure protection against injury and from drying out. If plants cannot be planted immediately upon delivery they should be protected with soil, wet peat moss, or in a manner acceptable to the project biologist. Plants, fertilizer, and mulch not installed immediately upon delivery shall be secured on the site to prevent theft or tampering. No plant shall be bound with rope or wire in a manner that could damage or break the branches. Plants transported on open vehicles should be secured with a protective covering to prevent windburn.

5.6.4c Preparation and Installation of Plant Materials

The planting contractor shall verify the location of all elements of the planting plan with the responsible Biologist prior to installation. The responsible Biologist reserves the right to adjust the locations of plantings during the installation period as appropriate. If obstructions are encountered that are not shown on the drawings, planting operations will cease until alternate plant locations have been selected by and/or approved by the responsible Biologist.

Circular plant pits with vertical sides will be excavated for all stock. The pits should be at least twelve (12) inches in diameter, and the depth of the pit should accommodate the entire root system. The bottom of each pit will be scarified to a depth of four (4) inches.

Broken roots should be pruned with a sharp instrument and rootballs should be thoroughly soaked prior to installation. Set plant material upright in the planting pit to proper grade and alignment. Water plants thoroughly midway through backfilling and add Agroform tablets. Water pits again upon completion of backfilling. No filling should occur around trunks or stems. Do not use frozen or muddy mixtures for backfilling. Form a ring of soil around the edge of each planting pit to retain water, and install a four (4) to six (6) inch layer of mulch around the base of each container plant.

5.6.5 Optional Temporary Irrigation Specifications

While the native species selected for mitigation are hardy and typically thrive in northwest conditions, and the proposed mitigation actions are planned in areas with sufficient hydroperiods for the species selected, some individual plants might perish due to dry conditions. Therefore, irrigation or regular watering may be provided as necessary for the duration of the first two (2) growing seasons while the native plantings become established.

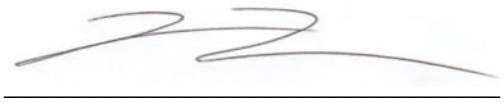
5.7 Critical Areas and Buffer/Habitat Management Recommendations

Site plans and construction details are included in Appendix C. Additional construction specifications will be included in the Contour Engineering, PLLC's site plans. The following habitat management plans are recommended to protect the drainage's hydrology and riparian areas:

- Reduce road footprint to the minimum safe width to retain natural functions and preserve critical area;
- Use footprint of existing unimproved roads to avoid additional impacts to critical areas;
- Use replacement culverts of sufficient size to allow unobstructed passage of fish and wildlife, flow of hydrology, small woody debris and sediment including cobble and small rocks that meet WDFW bankfull width standards;
- Limit fill or dredging within streambeds to no more than ten (10) cubic yards below OHW;
- Avoid fill within the streambed below Ordinary High Water;
- Temporary construction fencing at least thirty (30) inches tall should be erected around the perimeter of any impact areas to protect buffer/native vegetation areas prior to the initiation of any clearing or grading activities. The fencing should be posted with signage clearly identifying the buffer/native vegetation protection areas and should remain in place through site development and construction;
- All restoration actions should be overseen by a qualified fisheries biologist;
- Replant and seed the road prism and any disturbed areas with native vegetation excluding the road bed and shoulder approximately six (6) feet on either side;
- Limit work within ephemeral and seasonal stream beds to the dry season during the summer months to avoid in-water work and prevent downstream turbidity;
- Limit work in fish-bearing streams to June 15 through March 14 to avoid impacting juvenile salmonid species;
- Erosion and sediment control that meets or exceeds the standards set forth in the Kitsap County Storm Water Design Manual shall be provided in the Temporary Erosion and Sediment Control Plan prior to project implementation;
- The soil duff layer should remain undisturbed to the greatest extent possible near all critical areas;
- Vehicles, construction materials, fuel, and/or other hazardous materials should not be placed in buffer/native vegetation protection areas. Movement of any vehicles within buffer/native vegetation protected areas should be limited to the greatest extent possible;
- Any disturbed areas within the proposed project area should be replanted using native shrubs and/or groundcovers listed in Table 18 to help retain soils and increase biodiversity of macroinvertebrates (i.e.- insects), and
- Use only pesticides, fertilizers, or herbicides approved by the U.S. EPA or Washington Department of Ecology, and only as necessary. Where approved, herbicides should be applied by a licensed applicator in accordance with the safe application practices on the label. These items should also be stored as far as possible from the shoreline. Avoid use of chemicals banned by the EPA in all areas (DDT; creosote; lindane; silvex; aldrin; dieldrin; mirex; 2,4,5-T; Chlordane; kepone; pentachlorophenal (penta); toxaphenezax, et cetera).

Chapter 6. Report Summary

All field inspections, jurisdictional wetland boundary delineations, OHW determinations, habitat assessments, and supporting documentation, including this ***Wetland and Fish and Wildlife Habitat Assessment and Habitat Management Plan*** prepared for the ***Ueland Tree Farm/Kitsap Quarry – Private Access Route*** were prepared by, or under the direction of, Jeremy Downs, James Carsner, and Railin Santiago of Soundview Consultants LLC. Any deviations and/or alterations of the proposed project and/or habitat management recommendations provided in this document must be approved by the aforementioned parties at Soundview Consultants LLC. Please see Appendix G for a description of professional qualifications.

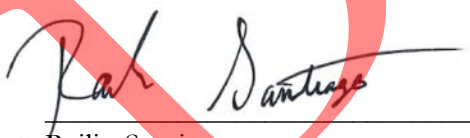


04/29/2014
Jeremy Downs — Date

Soundview Consultants LLC
2907 Harborview Drive
Gig Harbor, WA 98335
Office: (253) 514-8952 ext. 006
Fax: (253) 514-8954
jeremy@soundviewconsultants.com

04/29/14
James H. Carsner, PWS — Date

Soundview Consultants LLC
2907 Harborview Drive
Gig Harbor, WA 98335
Office: (253) 514-8952 ext. 008
Fax: (253) 514-8954
jim@soundviewconsultants.com



04/29/2014
Railin Santiago — Date

Soundview Consultants LLC
2907 Harborview Drive
Gig Harbor, WA 98335
Office: (253) 514-8952 ext. 014
Fax: (253) 514-8954
railin@soundviewconsultants.com

Chapter 7. References

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Appendix A — Methods and Tools

Table A-1. Methods and tools used to prepare the report.

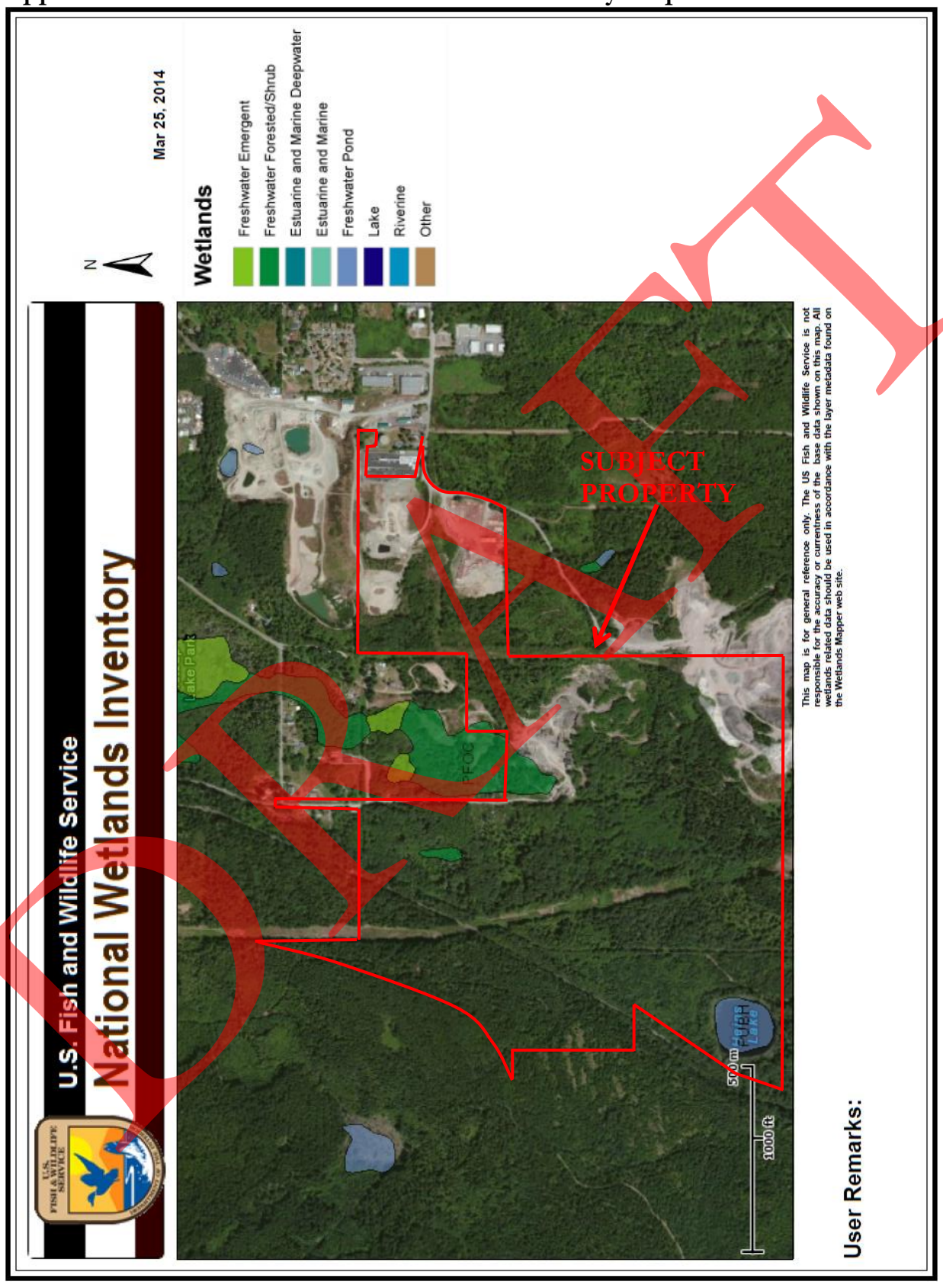
Parameter	Method or Tool	Website	Reference
Wetland Delineation	USACE 1987 Wetland Delineation Manual	http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf	**Environmental Laboratory.** 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
	Western Mountains, Valleys, and Coast Region Regional Supplement	http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finalsupp.pdf	**U.S. Army Corps of Engineers.** 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
Wetland Classification	USFWS / Cowardin Classification System	http://www.fws.gov/wetlands/Documents/Classification-of-Wetlands-and-Deepwater-Habitats-of-the-United-States.pdf	**Cowardin**, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. Government Printing Office, Washington, D.C.
	Hydrogeomorphic Classification (HGM) System	http://el.erdc.usace.army.mil/wetlands/pdfs/wrpde4.pdf	**Brinson**, M. M. (1993). "A hydrogeomorphic classification for wetlands," Technical Report WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
Wetland Rating	Washington State Wetland Rating System	http://www.ecy.wa.gov/biblio/0406025.html	**Hruby**. 2004. Washington State wetland rating system for western Washington –Revised. Publication # 04-06-025.
	Kitsap County Code	http://www.codepublishing.com/wa/kitsapcounty/	Uses State Rating System under Kitsap County Code Title 19.200.210.B
Wetland Indicator Status	National list of plant species that occur in wetlands	http://www.fws.gov/pacific/ecoservices/habcon/pdf/National%20List%20of%20Plant%20Species%201988.pdf	Robert W. Lichvar and John T. Kartesz 2009. North American Digital Flora: National WeUand Plant List, version 2.4.0 (https:l/weUand_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC.
Stream Delineation	Federal Ordinary High Water Mark Definition	http://www.usace.army.mil/inet/functions/cw/cecwo/reg/33cfr328.htm	Congressional Federal Register 33 Part 328 Definition of Waters of the United States.
	Draft State Ordinary High Water Mark Protocol	http://www.ecy.wa.gov/pubs/0806001.pdf	**Olson, P.** and E. Stockdale. 2008. Determining the Ordinary High Water Mark on Streams in Washington State. Washington State Department of Ecology, Shorelands & Environmental Assistance Program, Lacey, WA. Ecology Publication # 08-06-001.
Stream Classification	Department of Natural Resources (DNR) Water Typing System	**Forest Practices Water Typing:** http://www.stage.dnr.wa.gov/forestpractices/watertyping/ **WAC 222-16-030:** http://apps.leg.wa.gov/WAC/default.aspx?cite=222-16-030 **Water Type Mapping:** http://www3.wadnr.gov/dnrapp5/website/fpars/viewer.htm	Washington Administrative Code (WAC) 222-16-030. DNR Water typing system.
	Kitsap County Code	http://www.codepublishing.com/wa/kitsapcounty/	Kitsap County Code Title 19.300
	Bremerton Municipal Code	http://www.codepublishing.com/wa/Bremerton.html	Bremerton Municipal Code Title 20.14.700
Plant Names	USDA Plant Database	http://plants.usda.gov/	Website
Soils Data	NRCS Soil Survey	http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	Website GIS data based upon: **Murphy, Carl J., Cr. Chien-Lu Ping, Gerry Coleman, and Allen S. Zulauf**. 1980. Soil Survey of Kitsap County Area, Washington. United States Department of Agriculture, Soil Conservation Service in Cooperation with

Parameter	Method or Tool	Website	Reference
			Washington State Department of Natural Resources and Washington State University, Agricultural Research Center. Natural Resource Conservation Service.
Hydric Soils Data	Kitsap County Hydric Soils List	http://www.wa.nrcs.usda.gov/technical/soils/hydric_lists/hydsoil-wa-653.pdf	**Natural Resources Conservation Service.** 2001. Hydric Soils List: Kitsap County, Washington. U.S. Department of Agriculture. Washington D.C.
Threatened and Endangered Species	Washington Natural Heritage Program	http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf	**Washington Natural Heritage Program** (Data published 10/15/08). Endangered, threatened, and sensitive plants of Washington. Washington State Department of Natural Resources, Washington Natural Heritage Program, Olympia, WA
	Washington Priority Habitats and Species	http://wdfw.wa.gov/hab/phspage.htm	**Priority Habitats and Species (PHS) Program** (Data produced 02/07/11). Map of priority habitats and species in project vicinity. Washington Department of Fish and Wildlife (WDFW).
	NOAA fisheries species list and maps	http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Index.cfm and http://www.nmfs.noaa.gov/pr/species/	Website
	USFWS species lists by County	http://www.fws.gov/endangered/?s8fid=112761032793&s8fid=112762573903&countyName=Kitsap%2C+wa	Website
Species of Local Importance	WDFW GIS Data	http://wdfw.wa.gov/mapping/salmonscape/	Website

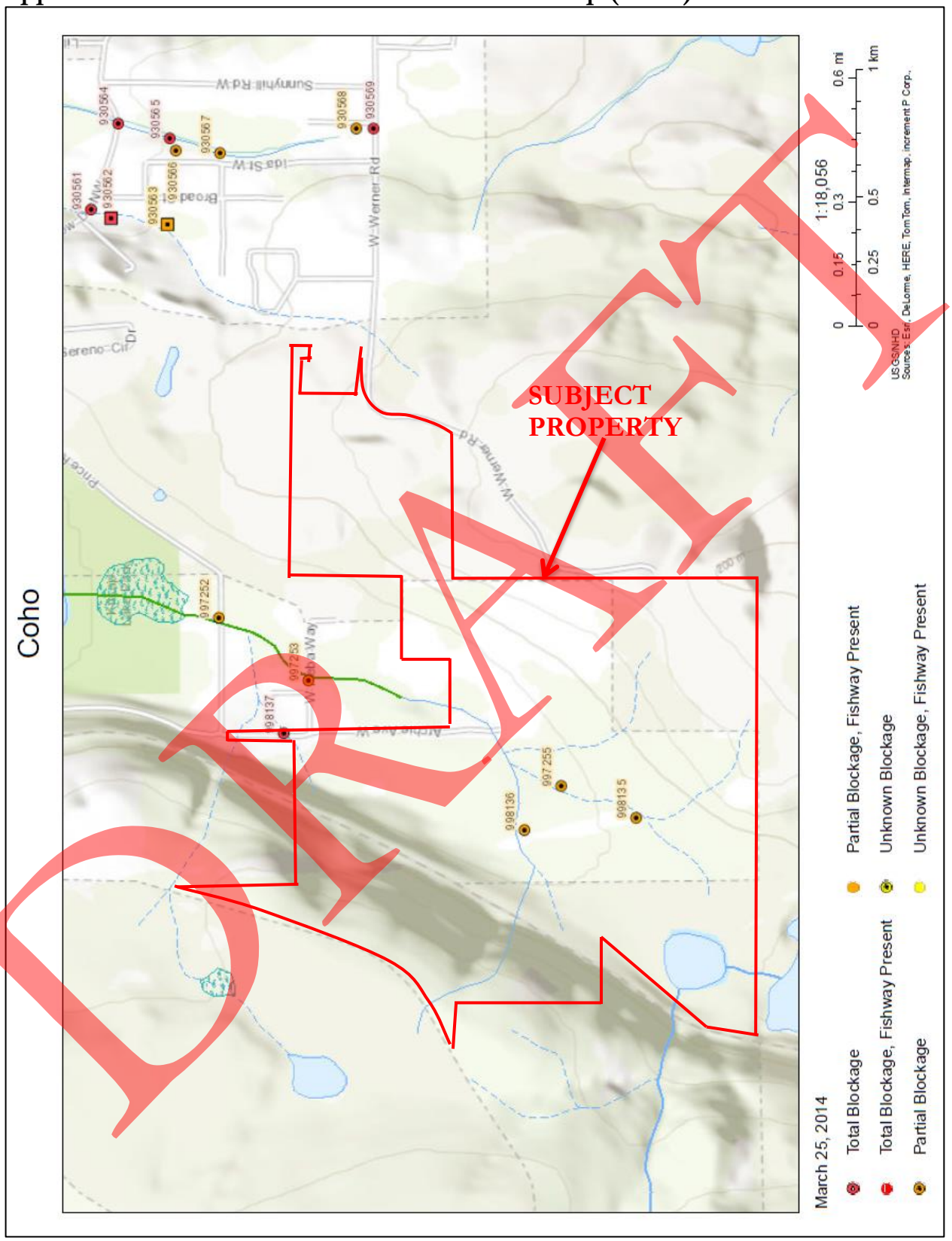
Appendix B — Background Information

This Appendix includes a USFWS National Wetland Inventory map (B1), WDFW Salmonid Distribution Map (Coho and fish barriers) (B2), Kitsap County GIS Data (B3), and NRCS Soil Survey map (B4), and WDFW PHS map (B5).

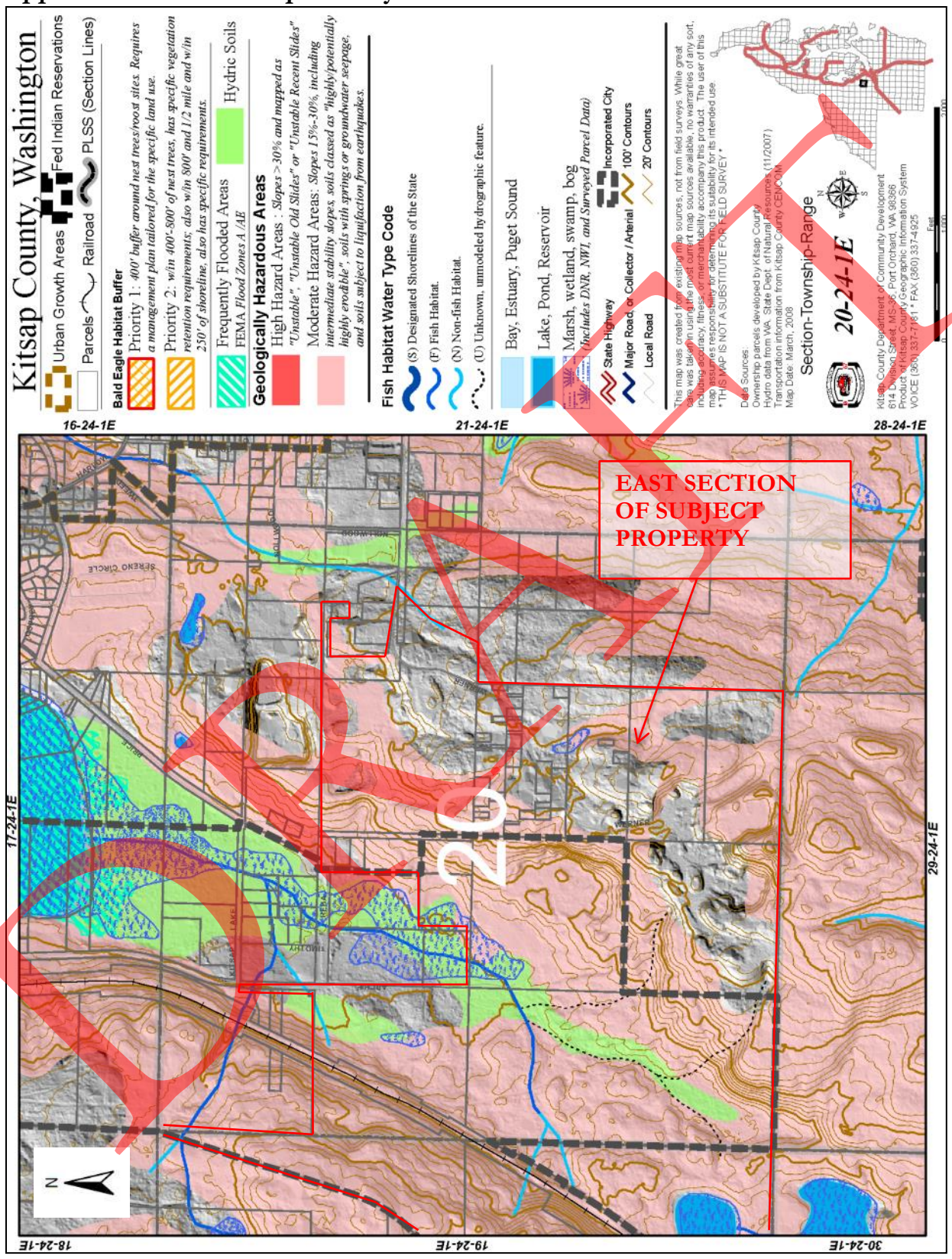
Appendix B1. USFWS National Wetland Inventory Map



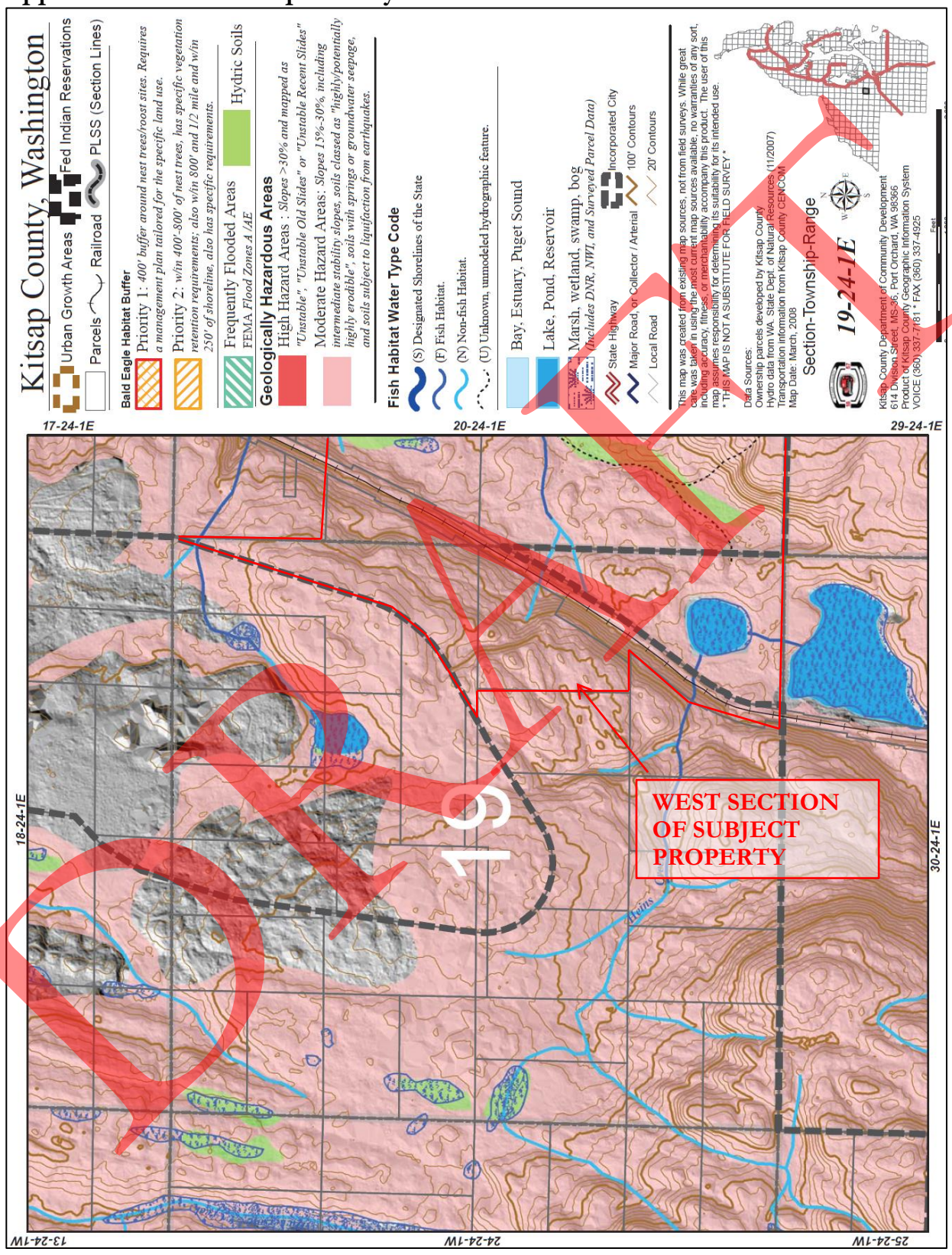
Appendix B2. WDFW Salmonid Distribution Map (Coho) with Fish Barriers



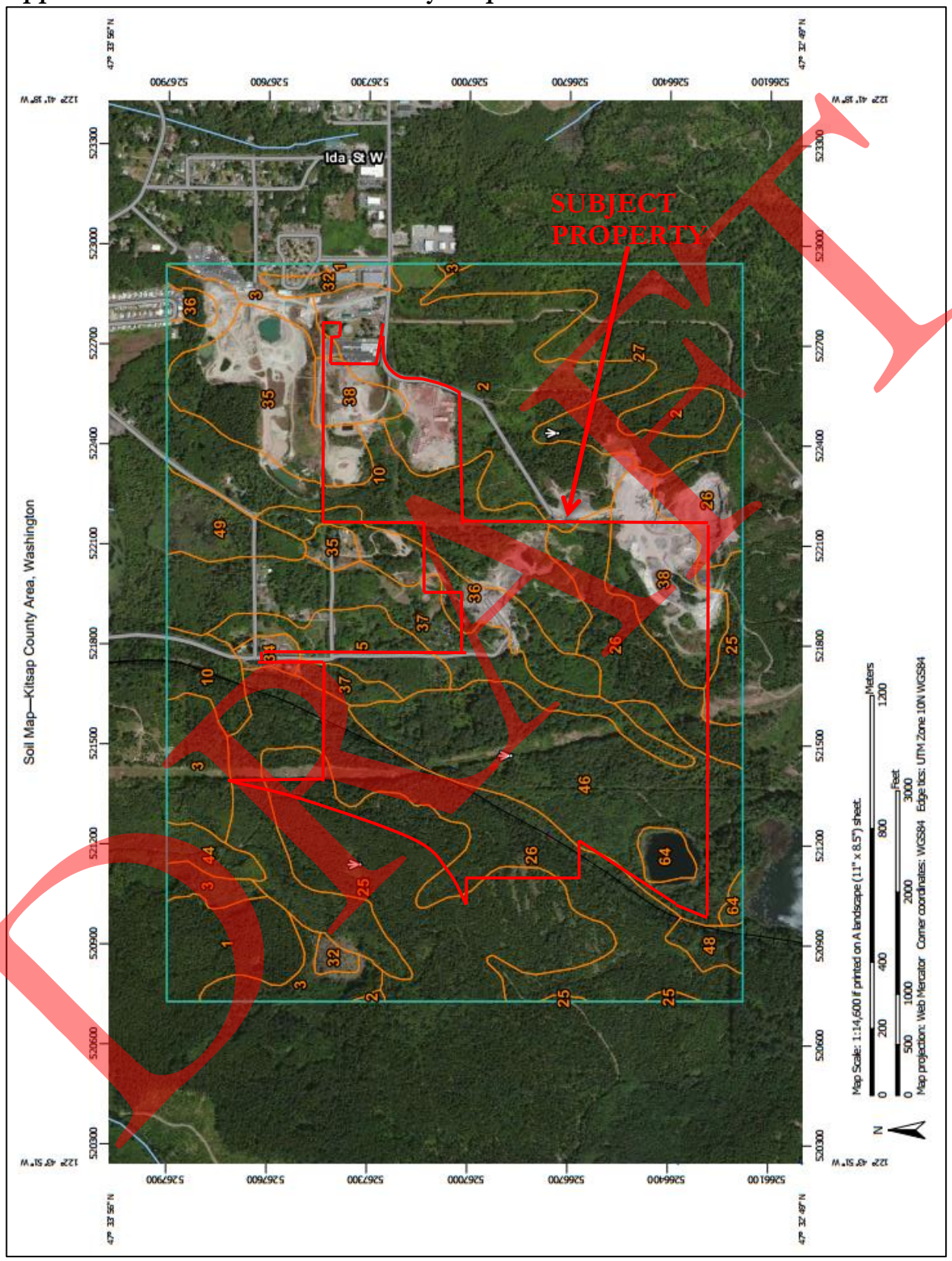
Appendix B3a. Kitsap County GIS Data East Section



Appendix B3b. Kitsap County GIS Data West Section



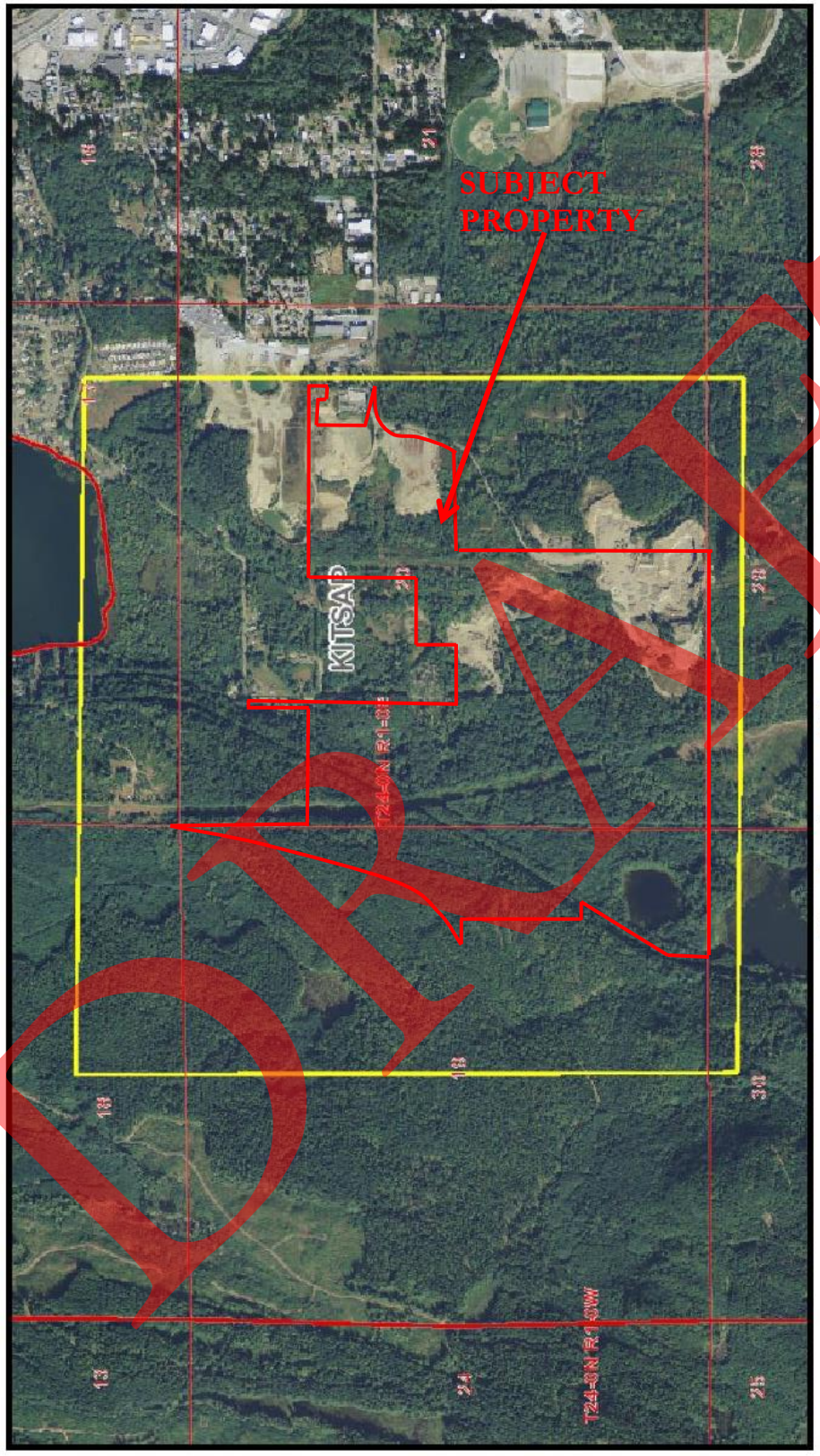
Appendix B4. NRCS Soil Survey Map



Map Unit Legend

Kitsap County Area, Washington (WA635)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1	Alderwood very gravelly sandy loam, 0 to 6 percent slopes	25.1	2.6%
2	Alderwood very gravelly sandy loam, 6 to 15 percent slopes	113.4	12.0%
3	Alderwood very gravelly sandy loam, 15 to 30 percent slopes	46.4	4.9%
5	Belfast loam	23.0	2.4%
10	Dystric Xerorthents, 45 to 70 percent slopes	85.3	9.0%
25	Kilchis very gravelly sandy loam, 15 to 30 percent slopes	100.5	10.6%
26	Kilchis very gravelly sandy loam, 30 to 70 percent slopes	158.9	16.8%
27	Kilchis-Shelton complex, 30 to 50 percent slopes	69.7	7.4%
32	McKenna gravelly loam	8.6	0.9%
34	Neilton gravelly loamy sand, 0 to 3 percent slopes	4.3	0.5%
35	Neilton gravelly loamy sand, 3 to 15 percent slopes	47.9	5.1%
36	Neilton gravelly loamy sand, 15 to 30 percent slopes	31.6	3.3%
37	Norma fine sandy loam	57.7	6.1%
38	Pits	42.5	4.5%
44	Ragnar fine sandy loam, 0 to 6 percent slopes	7.4	0.8%
46	Ragnar fine sandy loam, 15 to 30 percent slopes	94.2	10.0%
48	Schneider very gravelly loam, 45 to 70 percent slopes	6.2	0.7%
49	Semiahmoo muck	15.9	1.7%
64	Water	7.4	0.8%
Totals for Area of Interest		**945.9**	**100.0%**

Appendix B5. WDFW PHS Map



WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
PRIORITY HABITATS AND SPECIES REPORT

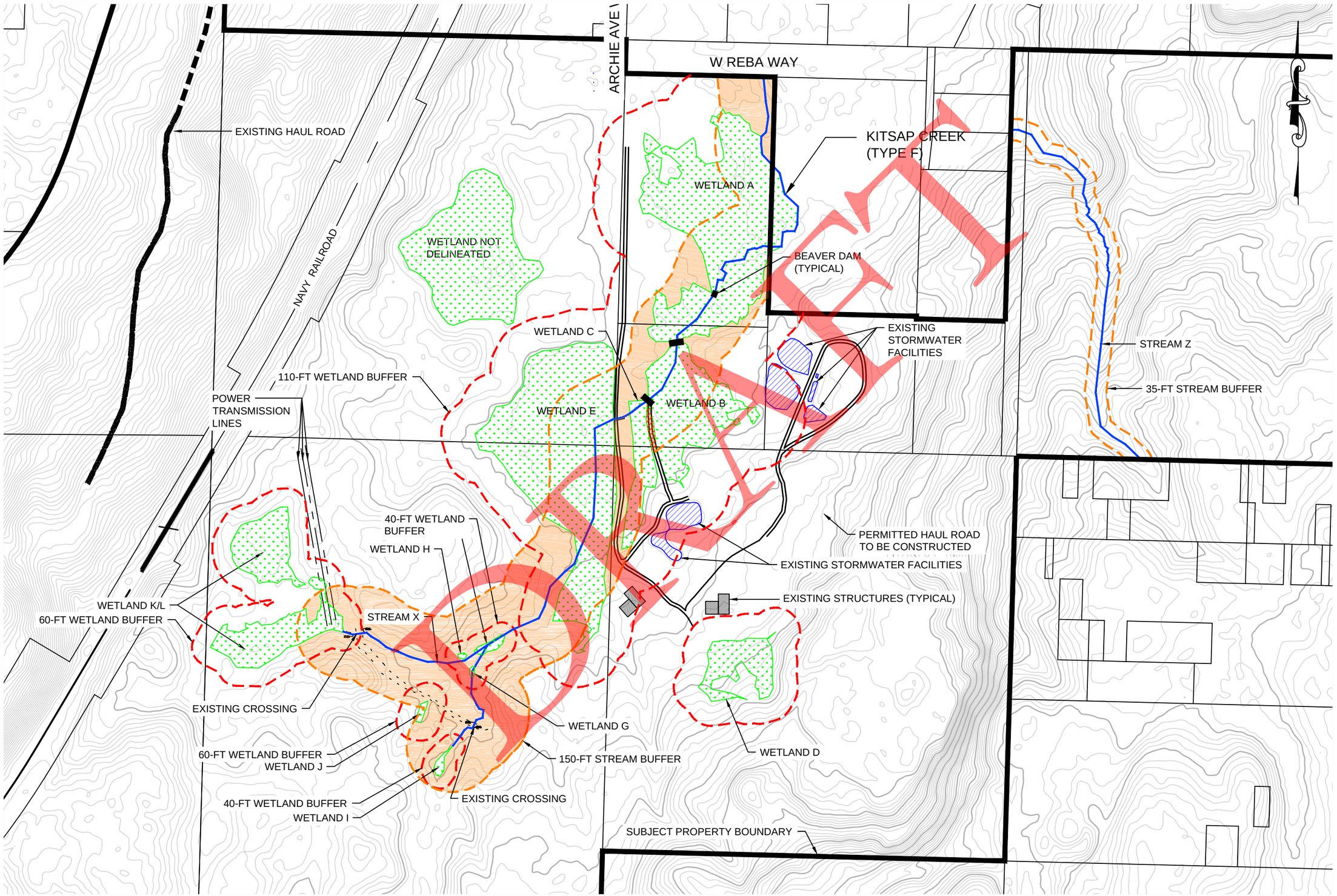
SOURCE DATASET: PHSPlusPublic Query ID: P140422104637
REPORT DATE: 04/22/2014 10.47 AM

Common Name Scientific Name Notes	Site Name Source Dataset Source Record Source Date	Priority Area Occurrence Type More Information (URL) Mgmt Recommendations	Accuracy	Federal Status State Status PHS Listing Status	Sensitive Data Resolution	Source Entity Geometry Type
Coast Resident Cutthroat Oncorhynchus clarki	Kitsap Creek FISHDIST 21730	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?id=00033	NA	N/A N/A PHS LISTED	N AS MAPPED	WA Department of Fish & Wildli Lines
Coast Resident Cutthroat Oncorhynchus clarki	Kitsap Creek FISHDIST 21731	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?id=00033	NA	N/A N/A PHS LISTED	N AS MAPPED	WA Department of Fish & Wildli Lines
Coho Oncorhynchus kisutch	Kitsap Creek SASI 3203	Occurrence Occurrence http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?id=00033	NA	Candidate N/A PHS Listed	N AS MAPPED	WDFW Fish Program Lines
Coho Salmon Oncorhynchus kisutch	Kitsap Creek FISHDIST 21734	Breeding Area Breeding area http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?id=00033	NA	N/A N/A PHS LISTED	N AS MAPPED	WDFW and/or LFA Reports, NWIFC Lines
Cutthroat Oncorhynchus clarki	Kitsap Creek SASI 7020	Occurrence Occurrence http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?id=00033	NA	Not Warranted N/A PHS Listed	N AS MAPPED	WDFW Fish Program Lines
Great blue heron Ardea herodias	KITSAP LAKE WS_OccurPolygon 500 February 17, 2004	Breeding Area Colony http://wdfw.wa.gov/publications/pub.php?id=00026	Standard buffer	N/A Monitored PHS LISTED	N AS MAPPED	WA Dept. of Fish and Wildlife Polygons
LACUSTRINE LITTORAL	N/A NWIPOLY	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Osprey Pandion haliaetus	ALEXANDER LAKE WS_OccurPoint 69420 June 01, 1990	N/A Nest N/A	1/4 mile (Quarter	N/A Monitored NOT A PHS LISTED	N AS MAPPED	WA Dept. of Fish and Wildlife Points
PALUSTRINE	N/A NWIPOLY	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
PALUSTRINE	N/A NWIPOLY	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
PALUSTRINE	N/A NWIPOLY	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
PALUSTRINE	N/A NWIPOLY	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
PALUSTRINE	N/A NWIPOLY	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
PALUSTRINE	N/A NWIPOLY	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
PALUSTRINE	N/A NWIPOLY	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Steelhead Oncorhynchus mykiss	Kitsap Creek SASI 6220	Occurrence Occurrence http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?id=00033	NA	Threatened N/A PHS Listed	N AS MAPPED	WDFW Fish Program Lines
Steelhead Trout Oncorhynchus mykiss	Kitsap Creek FISHDIST 21736	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?id=00033	NA	N/A N/A PHS LISTED	N AS MAPPED	WDFW and/or LFA Reports, NWIFC Lines

Appendix C — Plans and Cross-Sections

This Appendix includes site maps with existing site conditions and proposed site conditions.

UELAND TREE FARM - SITE INVENTORY

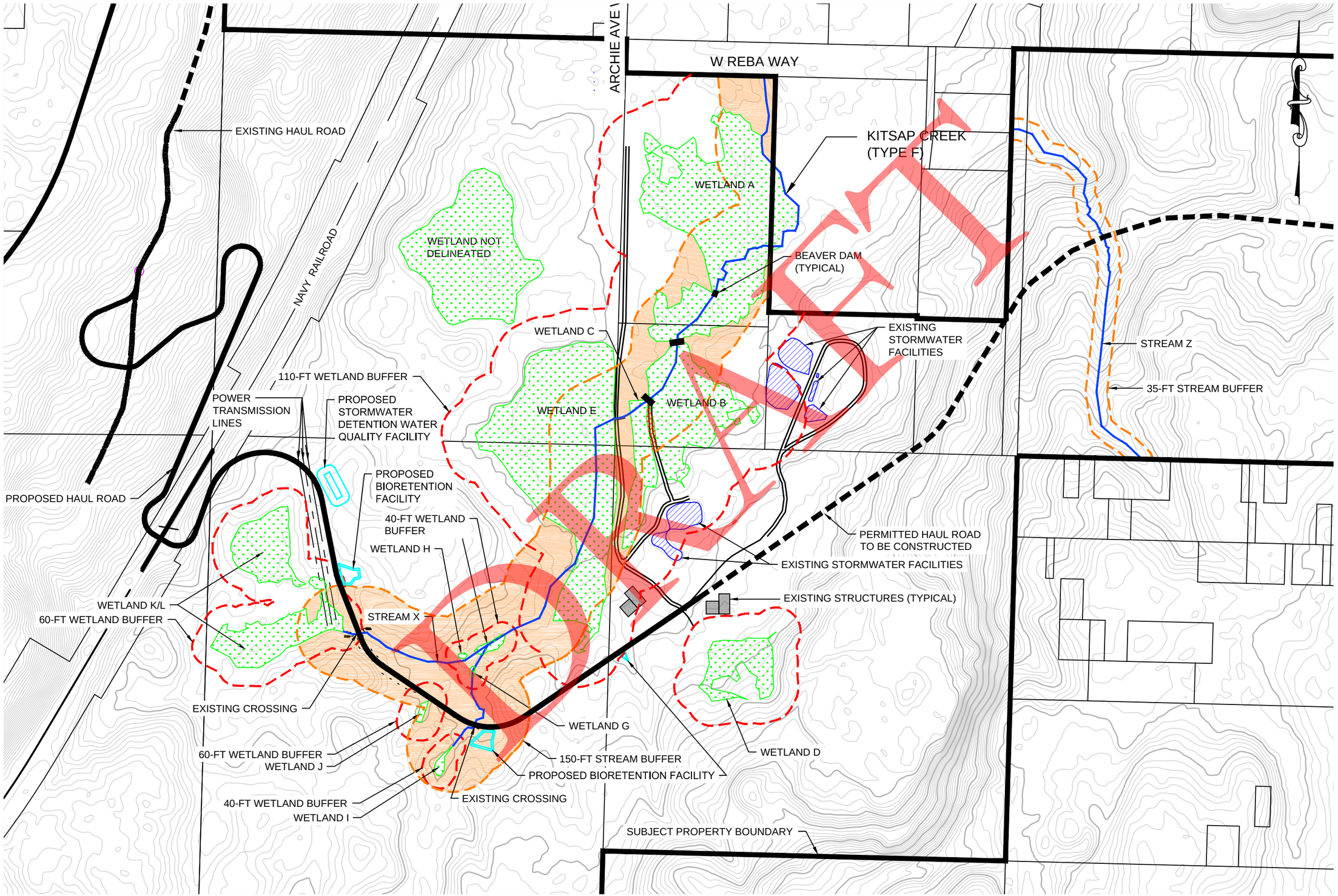


Soundview Consultants
Environmental, Natural Resources, and Land Use Consultants
2907 Harborview Drive
Gig Harbor, WA 98335
Office 253.514.8952
Fax 253.514.8954
www.soundviewconsultants.com

UELAND TREE FARM
818 ARCHIE AVE W
BREMERTON, WASHINGTON 98321
PORTIONS OF SECTION 19 & 20, TOWNSHIP 24N, RANGE 01E, W.M.

DATE:	4/10/2014
JOB:	1049.0009
BY:	KM/JR
SCALE:	1" = 300'
SHEET	1 OF 2

UELAND TREE FARM - SITE PLAN



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DATE:	4/10/2014
JOB:	1049.0009
BY:	KM/JR
SCALE:	1" = 300'
SHEET	2 OF 2

Appendix D — Wetland Delineation Data Sheets

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

Project/Site: Kitsap Quarry Wetland B City/County: Kitsap Sampling Date: 07/30/2012

Applicant/Owner: Bremerton West Ridge LLC State: WA Sampling Point: SP-01W

Investigator(s): Robbyn Myers, Jeremy Downs Section, Township, Range: 20, T24N, R01E, W.M

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): A Lat: 47d 33' 26.055" Long: 122d 42' 35.208" Datum: NAD83

Soil Map Unit Name: Norma Fine Sandy Loam NWI classification: PFOC

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: Precipitation 217% above normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 20)			
1. Alnus rubra	5	Y	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 10)			
1. Circaea alpina	<5	N	FAC
2. Lemna minuta	10	Y	OBL
3. Grasses	15	Y	(FAC)
4. Carex	10	Y	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 60

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	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	45 (A)		95 (B)

Prevalence Index = B/A = 2.11

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Inundated

SOIL

Sampling Point: SP-01W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inundated

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☒ No ☐

Remarks: sample area inundated - hydric soils known from nrcs data.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): ~5"

Water Table Present? Yes ☒ No ☐ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0"

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: Kitsap Quarry Wetlands A & B City/County: Kitsap Sampling Date: 07/30/2012

Applicant/Owner: Bremerton West Ridge LLC State: WA Sampling Point: SP-02U

Investigator(s): Robbyn Myers, Jermey Downs Section, Township, Range: 20, T24N, R01E, W.M

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR): A Lat: 47d 33' 25.955" Long: 122d 42' 34.424" Datum: NAD83

Soil Map Unit Name: Norma Fine Sandy Loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: Precipitation 217% above normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	15	Y	FAC
2. Pseudosuga menziesii	5	N	FACU
3.			
4.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 20)			
1. Alnus rubra	5	Y	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Poa annua	25	Y	FAC
2. Phleum prtense	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	= Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. Rubus armeniacus	40	Y	FACU
2. Rubus ursinus	5	N	FACU
	45	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	85 (A)		295 (B)

Prevalence Index = B/A = 3.47

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Area with historic disturbances, vegetated with early successional species. Cleared and Compacted. No Bare ground- as established.

SOIL

Sampling Point: SP-02U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 5/4	100	N/A	N/A	N/A	N/A	N/A	Loam with Cobble

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☒ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: point of resistence at 6".

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): -_____

Water Table Present? Yes ☐ No ☒ Depth (inches): -____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): -____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

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

Project/Site: Kitsap Quarry Wetland A City/County: Kitsap Sampling Date: 07/30/2012

Applicant/Owner: Bremerton West Ridge LLC State: WA Sampling Point: SP-03W

Investigator(s): Robbyn Myers, Jeremy Downs Section, Township, Range: 20, T24N, R01E, W.M

Landform (hillslope, terrace, etc.): Depressional Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): A Lat: 47d 33' 26.617" Long: 122d 42' 33.976" Datum: NAD83

Soil Map Unit Name: Norma Fine Sandy Loam NWI classification: PFOC

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: Precipitation 217% above normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	60	Y	FAC
2.			
3.			
4.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 20)			
1. Lysichiton americanus	25	Y	OBL
2. Maiathemum dilatum	<5	N	FAC
3. Asarum caudatum	<5	N	FACU
4. Lemna minuta	<5	N	OBL
5. Polystichum munitum	<5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	45	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 90% water

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	0	x 2 =	0
FAC species	65	x 3 =	195
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	105 (A)		335 (B)

Prevalence Index = B/A = 3.19

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Taken at 50% wetland to upland edge due to inundated sharp break in topography at waters edge.

SOIL

Sampling Point: SP-03W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inundated

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☒ No ☐

Remarks: Sample area inundated - Hydric soils known from NRCS data.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): ~6"

Water Table Present? Yes ☒ No ☐ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0"

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Ponded, at greater depths 20" - flooded, skunk cabbage

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

Project/Site: Kitsap Quarry Wetland C City/County: Kitsap Sampling Date: 07/30/2012

Applicant/Owner: Bremerton West Ridge LLC State: WA Sampling Point: SP-04U

Investigator(s): Robbyn Myers, Jeremy Downs Section, Township, Range: 20, T24N, R01E, W.M

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 0-2

Subregion (LRR): A Lat: 47d 33' 21.263" Long: 122d 42' 36.479" Datum: NAD83

Soil Map Unit Name: Norma Fine Sandy Loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: Precipitation 217% above normal

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	85	Y	FACU
2. Alnus rubra	45	Y	FAC
3.			
4.			
	130	= Total Cover	
Sapling/Shrub Stratum (Plot size: 20)			
1. Rubrus spectabilis	90	Y	FAC
2. Oemleria cerasiformis	10	N	FACU
3.			
4.			
5.			
	100	= Total Cover	
Herb Stratum (Plot size: 10)			
1. Athyrium filix-femina	<5	N	FAC
2. Dicentra formosa	<5	N	FACU
3. Polystichum munitum	15	N	FACU
4. Chenopodium	25	Y	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	50	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. Rubus armeniacus	<5	Y	FACU
2.			
	5	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	140	x 3 =	420
FACU species	145	x 4 =	580
UPL species	0	x 5 =	0
Column Totals:	285 (A)		1000 (B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Change in topography is significant upper elevation ~15' above wetland

SOIL

Sampling Point: SP-04U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 5/4	100	N/A	N/A	N/A	N/A	N/A	Peat Loam

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: Compacted with rooted materials. Point of resistence at 6".

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

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

Project/Site: Kitsap Quarry Wetland C City/County: Kitsap Sampling Date: 07/30/2012

Applicant/Owner: Bremerton West Ridge LLC State: WA Sampling Point: SP-05W

Investigator(s): Robbyn Myers, Jeremy Downs Section, Township, Range: 20, T24N, R01E, W.M

Landform (hillslope, terrace, etc.): Depressional Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): A Lat: 47d 33' 21.426" Long: 122d 42' 36.765" Datum: NAD83

Soil Map Unit Name: Norma Fine Sandy Loam NWI classification: PFOC

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: Precipitation 217% above normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	20	Y	FAC
2. Salix scouleriana	50	Y	FAC
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 20)			
1. Rubrus spectabilis	80	Y	FAC
2.			
3.			
4.			
5.			
	80	= Total Cover	
Herb Stratum (Plot size: 10)			
1. Equisetum telmateia	5	N	FAC
2. Athyrium filix-femina	10	N	FAC
3. Lysichiton americanus	40	Y	OBL
4. Asarum caudatum	<5	N	FACU
5. Ranunculus occidentalis	<5	N	FACW
6. Maiathemum dilatatum	<5	N	FAC
7.			
8.			
9.			
10.			
11.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 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	40	x 1 =	40
FACW species	5	x 2 =	10
FAC species	170	x 3 =	510
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	220 (A)		580 (B)

Prevalence Index = B/A = 2.64

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Taken at edge of wetland with ecotone 10' from plot.

SOIL

Sampling Point: SP-05W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-13	10 YR 3/1	100	N/A	N/A	N/A	N/A	N/A	Mucky Loam

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): -_____

Water Table Present? Yes ☒ No ☐ Depth (inches): 13"

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0"

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: Kitsap QuarryWetland D City/County: Kitsap Sampling Date: 07/30/2012

Applicant/Owner: Bremerton West Ridge LLC State: WA Sampling Point: SP-06U

Investigator(s): Robbyn Myers, Jeremy Downs Section, Township, Range: 20, T24N, R01E, W.M

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 5-10

Subregion (LRR): A Lat: 47d 33' 15.161" Long: 122d 42' 33.386 Datum: NAD83

Soil Map Unit Name: Dystric Xerorthents NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: Precipitation 217% above normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	60	Y	FACU
2. Tsuga heterophylla	15	N	FACU
3. Alnus rubra	45	Y	FAC
4.			
	120	= Total Cover	
Sapling/Shrub Stratum (Plot size: 20)			
1. Rubus spectabilis	10	Y	FAC
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Polystichum munitum	95	Y	FACU
2. Ranunculus repens	5	N	FACW
3. Athyrium filix-femina	10	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	110	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. Rubus ursinus	<5	Y	FACU
2.			
	5	= Total Cover	

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	65	x 3 =	195
FACU species	170	x 4 =	680
UPL species	0	x 5 =	0
Column Totals:	240 (A)		885 (B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: on upslope, topography break from lower wetland region

SOIL

Sampling Point: SP-06U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10 YR 4/4	100	N/A	N/A	N/A	N/A	N/A	Loam
8-15	10 YR 4/4	90	2.5 Y 7/3	5	N/A	N/A	N/A	Loam
			7.5 YR 4/4	1	N/A	N/A	N/A	Loam

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: Some large cobble

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): -_____

Water Table Present? Yes ☐ No ☒ Depth (inches): -____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): -____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

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

Project/Site: Kitsap Quarry Wetland D City/County: Kitsap Sampling Date: 07/30/2012

Applicant/Owner: Bremerton West Ridge LLC State: WA Sampling Point: SP-07W

Investigator(s): Robbyn Myers, Jeremy Downs Section, Township, Range: 20, T24N, R01E, W.M

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 5-10

Subregion (LRR): A Lat: 47d 33' 15.387" Long: 122d 42' 33.693" Datum: NAD83

Soil Map Unit Name: Dystric Xerorthents NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: Precipitation 217% above normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: 20)			
1. Rubus spectabilis	20	Y	FAC
2.			
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 10)			
1. Ranunculus repens	90	Y	FACW
2. Pteridium aquilinum	40	Y	FACU
3. Athyrium filix-femina	60	Y	FAC
4. Galium aparine	<5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	195	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	80	x 3 =	240
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	215 (A)		600 (B)

Prevalence Index = B/A = 2.8

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Slightly up from surface water at pond, canopy is upland set.

SOIL

Sampling Point: SP-07W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10 YR 3/2	80	2.5 Y 6/4	3	RM	M	N/A	Loam
7-11	10 YR 3/2	50	N/A	N/A	N/A	N/A	N/A	Loam
7-11	2.5 Y 5/2	50	N/A	N/A	N/A	N/A	N/A	Loam
11-13	2.5 Y 5/2	95	2.5 Y 5/6	3	RM	M	N/A	Loam
			10 YR 4/6	1	C	M	N/A	Loam

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☒ No ☐

Remarks: point of resistence at 13"

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): ~3"

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: Setting at crevice to pond and road where water was flowing ponded at downgradient near outter edge to strong water (presumed positive)

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

Project Site: KITSAP QUARRY City/County: BREMERTON/KITSAP Sampling Date: 01/09/2013

Applicant/Owner: BREMERTON WEST RIDGE LLC State: WA Sampling Point: SP-08

Investigator(s): JEREMY DOWNS, RAILIN PETERSON, KYLE MAUREN Section, Township, Range: NE 1/4 OF S20, T24N, R01E, W.M

Landform (hillslope, terrace, etc.): TOESLOPE Local relief (concave, convex, none): concave Slope (%): 0-2%

Subregion (LRR): A Lat: 47°33'29.46" Long: 122°42'15.43" Datum: NAD 83

Soil Map Unit Name: DYSTRIC XERORTHENTS 45-70% SLOPES NWI classification: NONE

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	**Is the Sampled Area within a Wetland?** **Yes** ☐ **No** ☒
Hydric Soil Present?	Yes	☐	No	☒	
Wetland Hydrology Present?	Yes	☒	No	☐	

Remarks: Does not meet all three wetland criteria. Not likely wetland at toe of slope; high water year.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rhamnus purshiana*	20	yes	FAC
2. _____			
3. _____			
4. _____			
50% = _____, 20% = _____	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. *Holodiscus discolor*	10	yes	FACU
2. *Rubus spectabilis*	10	yes	FAC
3. *Gaultheria shallon*	2	no	FAC
4. *Rubus armeniacus*	5	no	FACU
5. *Ribes lacustre*	5	no	FAC
50% = _____, 20% = _____	32	= Total Cover	
Herb Stratum (Plot size: _____)			
1. *Scirpus microcarpus*	20	yes	OBL
2. *Agrostis spp*	5	no	FAC
3. *Ranunculus repens*	10	yes	FAC
4. *Tolmiea menziesii*	5	no	FAC
5. *Polystichum munitum*	10	yes	FACU
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
50% = _____, 20% = _____	50	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. *Rubus ursinus*	5	yes	FACU
2. _____			
50% = _____, 20% = _____	5	= 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:	7	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	57	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x1 =	20
FACW species	_____	x2 =	_____
FAC species	57	x3 =	171
FACU species	30	x4 =	120
UPL species	_____	x5 =	_____
Column Totals:	107 (A)		311 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: KITSAP QUARRY

SOIL

Sampling Point: SP-08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10 YR 3/2	100	-	-	-	-	-	Sandy Silt Loam
8-11		100	-	-	-	-	-	Organics
11+	10 YR 3/2	100	-	-	-	-	-	Sandy Gravelly

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): -
Water Table Present?	Yes	☒	No	☐	Depth (inches): 0.5
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches): 0

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: KITSAP QUARRY City/County: BREMERTON/KITSAP Sampling Date: 01/15/2013

Applicant/Owner: BREMERTON WEST RIDGE LLC State: WA Sampling Point: SP-09

Investigator(s): JEREMY DOWNS, RAILIN PETERSON, KYLE MAUREN Section, Township, Range: NE 1/4 OF S20, T24N, R01E, W.M

Landform (hillslope, terrace, etc.): TOESLOPE Local relief (concave, convex, none): concave Slope (%): 0-2%

Subregion (LRR): A Lat: 47°33'29.58" Long: 122°42'15.72" Datum: NAD 83

Soil Map Unit Name: DYSTRIC XERORTHENTS 45-70% SLOPES NWI classification: NONE

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Arbutus menziesii*	15	no	UPL
2. *Pseudotsuga manziesii*	15	no	FACU
3. *Acer macrophyllum*	50	yes	FACU
4. _____	_____	_____	_____
50% = _____, 20% = _____	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. *Holodiscus discolor*	10	no	FACU
2. *Gaultheria shallon*	25	yes	FACU
3. *Cytisus scoparius*	10	no	UPL
4. *Mahonia nervosa*	2	no	FACU
5. *Acer circinatum*	5	no	FAC
50% = _____, 20% = _____	52	= Total Cover	
Herb Stratum (Plot size: _____)			
1. *Polystichum munitum*	20	yes	FACU
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
50% = _____, 20% = _____	20	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. *Rubus ursinus*	72	yes	FACU
2. _____	_____	_____	_____
50% = _____, 20% = _____	72	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	5	x3 =	15
FACU species	194	x4 =	776
UPL species	25	x5 =	125
Column Totals:	224 (A)		916 (B)

Prevalence Index = B/A = 4.1

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

Project Site: KITSAP QUARRY

SOIL

Sampling Point: SP-09

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	7.5 YR 3/3	100	-	-	-	-	-	SANDY LOAM

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/4/14

Applicant/Owner: State: WA Sampling Point: SP-10

Investigator(s): Jim Carsner, Hannah Blackstock Section, Township, Range: 20, 24N, 1E

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

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Kilchis very gravelly sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: No wetland indicators present. Does not meet wetland criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pseudotsuga menziesii	45	Yes	FACU
2. Alnus rubra	30	Yes	FAC
3.			
4.			
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Vaccinium ovatum	10	Yes	FACU
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Polystichum munitum	95	Yes	FACU
2. Gaultheria shallon	5	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species 30	x 3 = 90
FACU species 155	x 4 = 620
UPL species	x 5 =
Column Totals: 185 (A)	710 (B)

Prevalence Index = B/A = 3.84

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Does not meet hydrophytic vegetation criteria.

SOIL

Sampling Point: SP-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5 YR 2.5/3	100	-	-	-	-	Gravelly sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/4/14

Applicant/Owner: _____ State: WA Sampling Point: SP-11

Investigator(s): Jim Carsner, Hannah Blackstock Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 1-2

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Norma fine sandy loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: All three wetland criteria met. Sampled area is within a wetland (Wetland E).

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. Alnus rubra	100	Yes	FAC
2.			
3.			
4.			
	100 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus spectabilis	85	Yes	FAC
2.			
3.			
4.			
5.			
	85 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Tolmiea menziesii	25	Yes	FAC
2. Athyrium angustum	15	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 60

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 = _____
FACW species _____	x 2 = _____
FAC species 225	x 3 = 675
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 225 (A)	675 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: All vegetation was facultative. Hydrophytic vegetation criteria was met.

SOIL

Sampling Point: SP-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	7.5 YR 3/1	98	7.5 YR 2.5/3	2	-	M	Silty loam	
9-20	10 YR 4/3	98	10 YR 3/4	2	-	M	Silty loam	
20-24	10 YR 3/3	98	10 YR 3/3	2	-	M	Silty loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Secondary indicators B9 and D2 met. Wetland hydrology criteria met.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/4/14

Applicant/Owner: _____ State: WA Sampling Point: SP-12

Investigator(s): Jim Carsner, Hannah Blackstock Section, Township, Range: 20, 24N, 1E

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

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Norma fine sandy loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: No wetland indicators present. Does not meet wetland criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	70	Yes	FAC
2. Tsuga heterophylla	20	Yes	FACU
3. Acer circinatum	20	Yes	FAC
4.			
	110	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus spectabilis	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Polystichum munitum	40	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 100

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 100	x 3 = 300
FACU species 60	x 4 = 240
UPL species _____	x 5 = _____
Column Totals: 160 (A)	540 (B)

Prevalence Index = B/A = 3.38

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Prevalence index not met. Does not meet hydrophytic vegetation criteria.

SOIL

Sampling Point: SP-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1-3	-	-	-	-	-	-	-	Duff
3-9	10 YR 3/3	100	-	-	-	-	Silt loam	
9-16	7.5 YR 4/3	99	7.5 YR 4/3	1	-	M	Silt loam	
16-20	10 YR 4/3	99	7.5 YR 4/3	1	-	M	Silt loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/4/14

Applicant/Owner: _____ State: WA Sampling Point: SP-13

Investigator(s): Jim Carsner, Hannah Blackstock Section, Township, Range: 20, 24N. 1E

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1-2

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Neilton gravelly loamy sand, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: No wetland indicators present. Does not meet wetland criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophytllum	50	Yes	FACU
2. Alnus rubra	40	Yes	FAC
3.			
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus armeniacus	70	Yes	FACU
2. Oplopanax horridus	20	Yes	FAC
3. Rubus spectabilis	20	Yes	FAC
4.			
5.			
	110	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Tolmeia menziesii	50	Yes	FAC
2. Geranium robertianum	5	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	55	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 140	x 3 = 420
FACU species 125	x 4 = 500
UPL species _____	x 5 = _____
Column Totals: 265 (A)	920 (B)

Prevalence Index = B/A = 3.47

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Prevalence index not met. Does not meet hydrophytic vegetation criteria.

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10 YR 3/2	100	-	-	-	-	Gravelly sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/4/14

Applicant/Owner: _____ State: WA Sampling Point: SP-14

Investigator(s): Jim Carsner, Hannah Blackstock Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 1-2

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: All three wetland criteria met. Sampled area is within a wetland (Wetland F).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	90	Yes	FAC
2.			
3.			
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus spectabilis	80	Yes	FAC
2.			
3.			
4.			
5.			
	80	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Tolmiea menziesii	80	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (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 = _____
FACW species _____	x 2 = _____
FAC species 250	x 3 = 750
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 250 (A)	750 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: All vegetation was facultative. Hydrophytic vegetation criteria was met.

SOIL

Sampling Point: SP-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5 YR 2.5/1	100	-	-	-	-	Sandy silt	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☒ No ☐

Remarks: Hydric soil indicator A12 met. Hydric soil criteria was met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☒ No ☐ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Secondary indicators B9 and D2 met. Primary indicator A3 met. Wetland hydrology criteria met.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/4/14

Applicant/Owner: _____ State: WA Sampling Point: SP-15

Investigator(s): Jim Carsner, Hannah Blackstock Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 10

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: No wetland indicators present. Does not meet wetland criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga heterophylla	65	Yes	FACU
2. Prunus sp	35	Yes	FACU
3.			
4.			
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus spectabilis	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Polystichum munitum	35	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 60

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 10	x 3 = 30
FACU species 135	x 4 = 540
UPL species _____	x 5 = _____
Column Totals: 145 (A)	570 (B)

Prevalence Index = B/A = 3.93

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Prevalence index not met. Does not meet hydrophytic vegetation criteria.

Wetland indicator status of FACU applied to Prunus sp. as all Prunus species are listed as FACU or UPL in the USACE Regional Wetland Plant List.

SOIL

Sampling Point: SP-15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
1-3	-	-	-	-	-	-	-	Duff
3-15	10 YR 2/2	100	-	-	-	-	Sandy loam	
15-20	10 YR 3/4	100	-	-	-	-	Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/5/14

Applicant/Owner: State: WA Sampling Point: SP-16

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

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

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: All three wetland criteria met. Sampled area is within a wetland (Wetland G).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	30	Yes	FAC
2.			
3.			
4.			
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. Rubus spectabilis	30	Yes	FAC
2.			
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: ____)			
1. Tolmiea menziesii	70	Yes	FAC
2. Athyrium angustum	10	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (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 =
FACW species	x 2 =
FAC species 140	x 3 = 420
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 140 (A)	520 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: All vegetation was facultative. Hydrophytic vegetation criteria was met.

SOIL

Sampling Point: SP-16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5 YR 2.5/1	100	-	-	-	-	Silt loam	
12-20	10 YR 4/1	100	-	-	-	-	Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☒ No ☐

Remarks: Hydric soil indicator A12 met. Hydric soil criteria was met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☒ No ☐ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Primary indicators A2 and A3 met. Wetland hydrology criteria met.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2.5/14

Applicant/Owner: _____ State: WA Sampling Point: SP-17

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: No wetland indicators present. Does not meet wetland criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	60	Yes	FAC
2.			
3.			
4.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus spectabilis	100	Yes	FAC
2.			
3.			
4.			
5.			
	100	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Polystichum munitum	2	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 60

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	160	x 3 =	480
FACU species	2	x 4 =	8
UPL species		x 5 =	
Column Totals:	162 (A)		488 (B)

Prevalence Index = B/A = 3.01

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Prevalence index not met. Does not meet hydrophytic vegetation criteria.

SOIL

Sampling Point: SP-15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	-	-	-	-	-	-	-	Duff
2-5	10 YR 2/2	100	-	-	-	-	Silt loam	
5-18	10 YR 3/4	100	-	-	-	-	Silt loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/5/14

Applicant/Owner: _____ State: WA Sampling Point: SP-18

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: All three wetland criteria met. Sampled area is within a wetland (Wetland H).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus spectabilis		Yes	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Tolmiea menziesii		Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: All vegetation was facultative. Hydrophytic vegetation criteria was met.

SOIL

Sampling Point: SP-18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5 YR 2.5/1	100	-	-	-	-	Silt loam	
12-20	10 YR 4/1	100	-	-	-	-	Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☒ No ☐

Remarks: Hydric soil indicator A12 met. Hydric soil criteria was met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches):

Water Table Present? Yes ☒ No ☐ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 8

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Primary indicators A2 and A3 met. Wetland hydrology criteria met.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2.5/14

Applicant/Owner: _____ State: WA Sampling Point: SP-18

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: No wetland indicators present. Does not meet wetland criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra		Yes	FAC
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Polystichum munitum		Yes	FACU
2. Athyrium angustum		Yes	FAC
3. Blechnum spicant		Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 60

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Does not meet hydrophytic vegetation criteria.

SOIL

Sampling Point: SP-19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10 YR 3/1	100	-	-	-	-		
8-16	10 YR 6/2	100	-	-	-	-		

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/5/14

Applicant/Owner: _____ State: WA Sampling Point: SP-20

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: All three wetland criteria met. Sampled area is within a wetland (Wetland I).

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus spectabilis	60	Yes	FAC
2. Oplopanax horridus	20	Yes	FAC
3.			
4.			
5.			
	80 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Tolmiea menziesii	100	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (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 = _____
FACW species _____	x 2 = _____
FAC species 180	x 3 = 540
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 180 (A)	540 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: All vegetation was facultative. Hydrophytic vegetation criteria was met.

SOIL

Sampling Point: SP-20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5 YR 2.5/1	100	-	-	-	-	Silt loam	
14-20	7.5 YR 5/1	100	-	-	-	-	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.)

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☒ No ☐

Remarks: Hydric soil indicator A12 met. Hydric soil criteria was met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☒ No ☐ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Primary indicators A2 and A3 met. Wetland hydrology criteria met.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2.5/14

Applicant/Owner: _____ State: WA Sampling Point: SP-21

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: No wetland indicators present. Does not meet wetland criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	50	Yes	FACU
2. Alnus rubra	20	Yes	FAC
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus spectabilis	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Polystichum munitum	80	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 30	x 3 = 90
FACU species 130	x 4 = 520
UPL species _____	x 5 = _____
Column Totals: 160 (A)	610 (B)

Prevalence Index = B/A = 3.81

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Does not meet hydrophytic vegetation criteria.

SOIL

Sampling Point: SP-21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10 YR 3/2	100	-	-	-	-	Gravelly sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/5/14

Applicant/Owner: _____ State: WA Sampling Point: SP-22

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: All three wetland criteria met. Sampled area is within a wetland (Wetland J).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Oenanthe sarmentosa		Yes	OBL
2. Scirpus			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria was met.

SOIL

Sampling Point: SP-22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-9	7.5 YR 2.5/1	100	-	-	-	-	Silt loam	
9-18	10 YR 5/2	95	10 YR 3/6	5	-	M	Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☒ No ☐

Remarks: Hydric soil indicator A12 met. Hydric soil criteria was met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Primary indicators A2 and A3 met. Wetland hydrology criteria met.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2.5/14

Applicant/Owner: _____ State: WA Sampling Point: SP-23

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: No wetland indicators present. Does not meet wetland criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pseudotsuga menziesii	40	Yes	FACU
2. Alnus rubra	20	Yes	FAC
3. Acer macrophyllum	20	Yes	FACU
4.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus spectabilis	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Polystichum munitum	1	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Does not meet hydrophytic vegetation criteria.

SOIL

Sampling Point: SP-23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5 YR 2/2	100	-	-	-	-	Sandy loam	
3-9	7.5 YR 2.5/2	100	-	-	-	-	Sandy loam	
9-14	10 YR 3/6	100	-	-	-	-	Loam	
14-20	7.5 YR 4/4	100	-	-	-	-	Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/5/14

Applicant/Owner: _____ State: WA Sampling Point: SP-24

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☐ No ☐ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: Not all three wetland criteria met. Sampled area is not classified as a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus spectabilis	20	Yes	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Athyrium angustum	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 90

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 30	x 3 = 90
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: All vegetation was facultative. Hydrophytic vegetation criteria was met. However, 90% of the area was bare ground.

SOIL

Sampling Point: SP-24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5 YR 2.5/2	100	-	-	-	-	Silt loam	
16-18	10 YR 4/2	99	10 YR 3/6	1	-	M	Silt loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 19

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/6/14

Applicant/Owner: Ueland State: WA Sampling Point: SP-25

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☐ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. ALRU	30	Y	FAC
2.			
3.			
4.			
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. RUSP	2	N	FAC
2.			
3.			
4.			
5.			
	2	= Total Cover	
Herb Stratum (Plot size: _____)			
1. CAOB	80	Y	OBL
2. ATFIFE	1	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	81	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species		x 2 =	
FAC species	30	x 3 =	90
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = 170/110=1.55

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: All vegetation was faculative or obligate. Hydrohytic vegetation criteria was met.

SOIL

Sampling Point: SP-25

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 2.5/1	100	-	-	-	-	-	Silt Loam
4-18	7.5YR 4/3	90	7.5YR 4/6	10	-	-	-	Silt Loam

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 8

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Water crystals at the surface. Secondary indicators A3 and B9 met. Wetland hydrology criteria was met.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/5/14

Applicant/Owner: Ueland State: WA Sampling Point: SP-26

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: Upland of SP-25 and next to K-10

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. TSHE	50	Y	FACU
2.			
3.			
4.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. OPHO	20	Y	FAC
2. ILAQ	10	N	FACU
3. RUSP	1	N	FAC
4.			
5.			
	31	= Total Cover	
Herb Stratum (Plot size: _____)			
1. BLSP	40	Y	FAC
2. POMU	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 61	x 3 = 183
FACU species 90	x 4 = 360
UPL species _____	x 5 = _____
Column Totals: 151 (A)	543 (B)

Prevalence Index = B/A = 3.60

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Does not meet hydrophytic vegetation criteria.

SOIL

Sampling Point: SP-26

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 2.5/1							
3-10	7.5YR 4/3							No Mottles
10-18	7.5YR 4/3	99	7.5YR 4/6	1				

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/6/14

Applicant/Owner: Ueland State: WA Sampling Point: SP-27

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: Near K-32 and K-45

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. RUSP	5	N	FAC
2. SPDO	15	Y	FACW
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: _____)			
1. GLEL	80	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species 95	x 2 = 190
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 95 (A)	190 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: All vegetatation was faculative or faculative-wet. Hydrophytic vegetation criteria was met.

SOIL

Sampling Point: SP-27

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 2.5/1						silt loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☒

Remarks: Hydrogen sulfide odor in the soil. Hydric soil indicators A4 and A12 were met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☒ No ☐ Depth (inches): 1

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: Primary indicators A2 and A3 were met. Wetland hydrology criteria met.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/6/14

Applicant/Owner: Ueland State: WA Sampling Point: SP-28

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☒

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: Near K-32 and K-45

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. VAOV	1	N	FAC
2. RUSP	20	Y	FAC
3. ALRU	50	Y	FAC
4. ACMA	5	N	FACU
5.			
	76	= Total Cover	
Herb Stratum (Plot size: ____)			
1. POMU	20	Y	FACU
2. PTAQ	15	Y	FACU
3. AGST	10	N	FAC
4. ATFIFE	10	N	FAC
5. BLSP	1	N	FAC
6.			
7.			
8.			
9.			
10.			
11.			
	56	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. RUUR	20	Y	FACU
2.			
	20	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 97	x 3 = 291
FACU species 55	x 4 = 220
UPL species _____	x 5 = _____
Column Totals: 152 (A)	511 (B)

Prevalence Index = B/A = 3.36

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Does not meet hydrophytic vegetation indicator criteria.

SOIL

Sampling Point: SP-28

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100						
8-11	7.5YR 2.5/1	100						
11-18	7.5YR 4/4	100						

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/6/14

Applicant/Owner: Ueland State: WA Sampling Point: SP-29

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: Next to L%; Forested Scrub/Shrub wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. RUSP	5	N	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: _____)			
1. TOME	40	Y	OBL
2. OESA	60	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	100	x 1 =	100
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	100 (A)		100 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: All vegetation obligate or faculative. Hydrophytic vegetation criteria was met.

SOIL

Sampling Point: SP-29

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/2	85	7.5YR 3/4	15				
6-18	7.5YR 4/3	95	7.5YR 3/4	5				

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: Hydric soil indicator A12 met. Hydric soil criteria was met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☒ No ☐ Depth (inches): 3

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): Surface

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Primary indicators A1 and A3 met. Wetland hydrology criteria met.

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

Project/Site: Kitsap Quarry City/County: Kitsap County Sampling Date: 2/6/14

Applicant/Owner: Ueland State: WA Sampling Point: SP-30

Investigator(s): Jim Carsner, Bill House Section, Township, Range: 20, 24N, 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Ragnar fine sandy loam, 15-30 percent slopes NWI classification: N/A

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: Upland from L5

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. ALRU	50	Y	FAC
2.			
3.			
4.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. RUSP	15	N	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: _____)			
1. POMU	75	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 65	x 3 = 195
FACU species 75	x 4 = 300
UPL species _____	x 5 = _____
Column Totals: 140 (A)	495 (B)

Prevalence Index = B/A = 3.53

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Does not meet hydrophytic vegetation criteria.

SOIL

Sampling Point: SP-30

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100						
8-11	7.5YR 2.5/1	100						
11-18	7.5YR 4/4	100						

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators present. Does not meet hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No wetland hydrology indicators present. Does not meet wetland hydrology criteria.

Appendix E — Wetland Rating Forms

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): KITSAP QUARRY - WETLAND A Date of site visit: 7/10/2012

Rated by: JEREMY DOWNS Trained by Ecology? Yes ☒ No ☐ Date of training: 2006

SEC: 20 TOWNSHP: 24 N RNGE: 01 E Is S/T/R in Appendix D? Yes ☐ No ☒

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 209,483 SF (4.81 ACRE)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	4
Score for Hydrologic Functions	6
Score for Habitat Functions	24
TOTAL Score for Functions	34

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

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

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics	
Estuarine	☐
Natural Heritage Wetland	☐
Bog	☐
Mature Forest	☐
Old Growth Forest	☐
Coastal Lagoon	☐
Interdunal	☐
None of the above	☒

Wetland HGM Class used for Rating	
Depressional	☒
Riverine	☐
Lake-fringe	☐
Slope	☐
Flats	☐
Freshwater Tidal	☐
	☐
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.

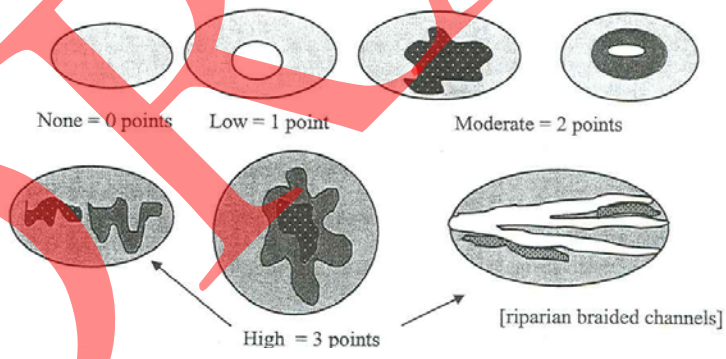
HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and 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.

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 ☐ • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ... points = 2 ☐ • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .. points = 1 ☒ • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ☐ **1**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) YES points = 4 NO points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area..... points = 5 ☐ • Wetland has persistent, ungrazed vegetation > = 1/2 of area..... points = 3 ☒ • Wetland has persistent, ungrazed vegetation > = 1/10 of area..... points = 1 ☐ • Wetland has persistent, ungrazed vegetation < 1/10 of area..... points = 0 ☐ **Map of Cowardin vegetation classes**	**Figure** ☐ **3**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 ☐ • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 ☐ • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 ☒ **Map of Hydroperiods**	**Figure** ☐ **0**
	Total for D 1 *Add the points in the boxes above*	**4**
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☐ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other _____ ☐ YES multiplier is 2 ☒ NO multiplier is 1	Multiplier 1
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	**4**
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 ☐ • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet .... points = 2 ☐ • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	0
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 ☐ • The wetland is a "headwater" wetland..... points = 5 ☐ • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 ☐ • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet..... points = 3 ☒ • Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water .points = 1 ☐ • Marks of ponding less than 0.5 ft ..... points = 0 ☐	3
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit..... points = 5 ☐ • The area of the basin is 10 to 100 times the area of the unit..... points = 3 ☐ • The area of the basin is more than 100 times the area of the unit ..... points = 0 ☒ • Entire unit is in the FLATS class ..... points = 5 ☐	0
	Total for D 3 *Add the points in the boxes above*	3

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems. ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p. 49)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	**<u>6</u>**

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** ☐ **2**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 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** ☐ **2**
	H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* If you counted: > 19 species ..... points = 2 ☒ 5 – 19 species..... points = 1 ☐ 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** ☐ **3**
	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.*	5
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**14**

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 ☐** **2**
	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	1

Comments: _____

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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 → **4**

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)

H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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	14
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	**24**

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: _____

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): KITSAP QUARRY - WETLAND B Date of site visit: 7/10/11

Rated by: JEREMY DOWNS Trained by Ecology? Yes ☒ No ☐ Date of training: 2006

SEC: 20 TOWNSHP: 24 N RNGE: 01 E Is S/T/R in Appendix D? Yes ☐ No ☒

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 78,502 SF (1.80 ACRE)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	5
Score for Hydrologic Functions	10
Score for Habitat Functions	24
TOTAL Score for Functions	39

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

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

Summary of basic information about the wetland unit.

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

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.

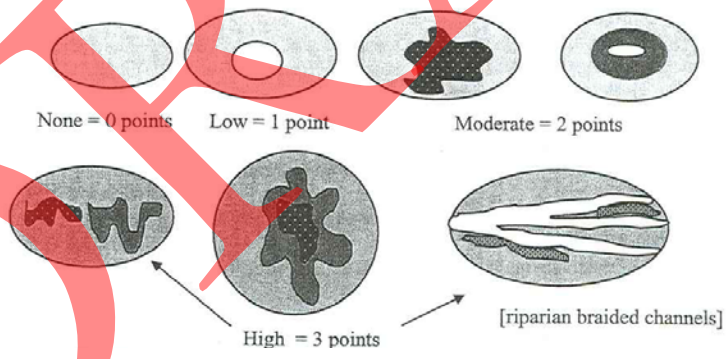
HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and 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.

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the <u>potential</u> to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 ☐ • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ... points = 2 ☒ • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .. points = 1 ☐ • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ☐ **2**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) YES points = 4 NO points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area..... points = 5 ☐ • Wetland has persistent, ungrazed vegetation > = 1/2 of area..... points = 3 ☒ • Wetland has persistent, ungrazed vegetation > = 1/10 of area..... points = 1 ☐ • Wetland has persistent, ungrazed vegetation < 1/10 of area..... points = 0 ☐ **Map of Cowardin vegetation classes**	**Figure** ☐ **3**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 ☐ • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 ☐ • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 ☒ **Map of Hydroperiods**	**Figure** ☐ **0**
	Total for D 1 *Add the points in the boxes above*	**5**
D 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 or orchards within 150 ft. of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☐ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other _____ ☐ YES multiplier is 2 ☒ NO multiplier is 1	*(see p. 44)* Multiplier 1
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	**5**
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the <u>potential</u> to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 ☐ • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet .... points = 2 ☒ • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	2
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 ☐ • The wetland is a "headwater" wetland..... points = 5 ☐ • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 ☐ • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet..... points = 3 ☒ • Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water .points = 1 ☐ • Marks of ponding less than 0.5 ft ..... points = 0 ☐	3
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit..... points = 5 ☐ • The area of the basin is 10 to 100 times the area of the unit..... points = 3 ☐ • The area of the basin is more than 100 times the area of the unit ..... points = 0 ☒ • Entire unit is in the FLATS class ..... points = 5 ☐	0
	Total for D 3 *Add the points in the boxes above*	5

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems. ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p. 49)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	**<u>10</u>**

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** ☐ **2**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 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** ☐ **2**
	H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* If you counted: > 19 species ..... points = 2 ☒ 5 – 19 species..... points = 1 ☐ 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** ☐ **3**
	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.*	5
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**14**

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 ☐** **2**
	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	1

Comments: _____

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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 → **4**

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)

H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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 → **14**

◆ **Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1*** → **24**

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: _____

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): KITSAP QUARRY - WETLAND C Date of site visit: 7/10/11

Rated by: JEREMY DOWNS Trained by Ecology? Yes ☒ No ☐ Date of training: 2006

SEC: 20 TOWNSHP: 24 N RNGE: 01 E Is S/T/R in Appendix D? Yes ☐ No ☒

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 20,969 SF (0.48 ACRE)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	9
Score for Hydrologic Functions	10
Score for Habitat Functions	22
TOTAL Score for Functions	41

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

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

Summary of basic information about the wetland unit.

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

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.

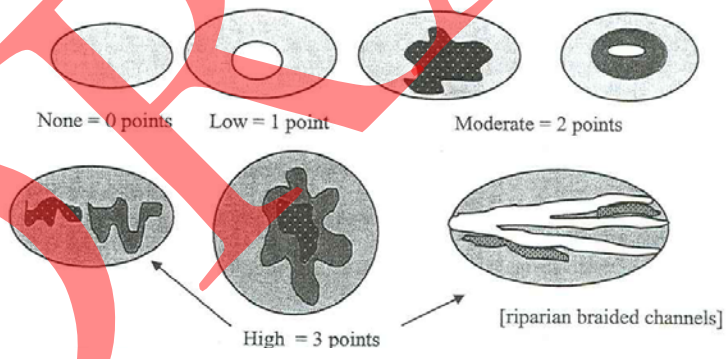
HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and 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.

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 ☐ • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ... points = 2 ☒ • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .. points = 1 ☐ • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ☐ **2**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) YES points = 4 NO points = 0	4
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area..... points = 5 ☐ • Wetland has persistent, ungrazed vegetation > = 1/2 of area..... points = 3 ☒ • Wetland has persistent, ungrazed vegetation > = 1/10 of area..... points = 1 ☐ • Wetland has persistent, ungrazed vegetation < 1/10 of area..... points = 0 ☐ **Map of Cowardin vegetation classes**	**Figure** ☐ **3**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 ☐ • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 ☐ • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 ☒ **Map of Hydroperiods**	**Figure** ☐ **0**
	Total for D 1 *Add the points in the boxes above*	**9**
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☐ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other _____ ☐ YES multiplier is 2 ☒ NO multiplier is 1	Multiplier 1
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	**9**
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 ☐ • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet .... points = 2 ☒ • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	2
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 ☐ • The wetland is a "headwater" wetland..... points = 5 ☐ • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 ☐ • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet..... points = 3 ☒ • Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water .points = 1 ☐ • Marks of ponding less than 0.5 ft ..... points = 0 ☐	3
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit..... points = 5 ☐ • The area of the basin is 10 to 100 times the area of the unit..... points = 3 ☐ • The area of the basin is more than 100 times the area of the unit ..... points = 0 ☒ • Entire unit is in the FLATS class ..... points = 5 ☐	0
	Total for D 3 *Add the points in the boxes above*	5

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems. ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p. 49)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	**<u>10</u>**

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** ☐ **2**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 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** ☐ **2**
	H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* If you counted: > 19 species ..... points = 2 ☒ 5 – 19 species..... points = 1 ☐ 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** ☐ **3**
	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.*	3
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**12**

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** ☐ **2**
	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	1

Comments: _____

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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 **4**

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)

H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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*	12
	TOTAL for H 1 from page 8	10
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	**22**

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: _____

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): KITSAP QUARRY - WETLAND D Date of site visit: 7/10/11

Rated by: JEREMY DOWNS Trained by Ecology? Yes ☒ No ☐ Date of training: 2006

SEC: 20 TOWNSHP: 24 N RNGE: 01 E Is S/T/R in Appendix D? Yes ☐ No ☒

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 33,152 SF (0.76 ACRES)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	5
Score for Hydrologic Functions	16
Score for Habitat Functions	14
TOTAL Score for Functions	35

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

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

Summary of basic information about the wetland unit.

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

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.

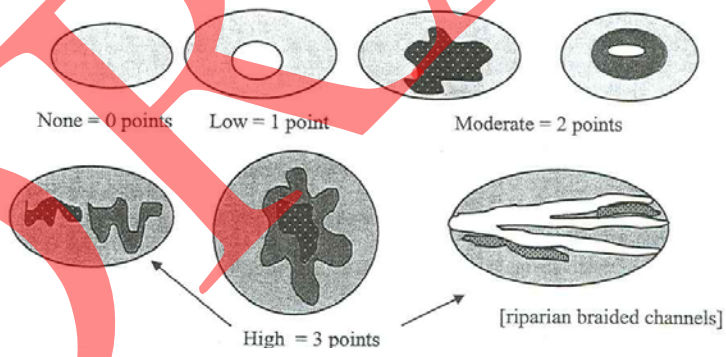
HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and 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.

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 ☐ • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ... points = 2 ☒ • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .. points = 1 ☐ • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ☐ **2**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) YES points = 4 NO points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area..... points = 5 ☐ • Wetland has persistent, ungrazed vegetation > = 1/2 of area..... points = 3 ☒ • Wetland has persistent, ungrazed vegetation > = 1/10 of area..... points = 1 ☐ • Wetland has persistent, ungrazed vegetation < 1/10 of area..... points = 0 ☐ **Map of Cowardin vegetation classes**	**Figure** ☐ **3**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 ☐ • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 ☐ • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 ☒ **Map of Hydroperiods**	**Figure** ☐ **0**
	Total for D 1 *Add the points in the boxes above*	**5**
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☐ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other _____ ☐ YES multiplier is 2 ☒ NO multiplier is 1	Multiplier 1
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	**5**
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 ☐ • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet .... points = 2 ☒ • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	2
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 ☐ • The wetland is a "headwater" wetland..... points = 5 ☐ • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 ☐ • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet..... points = 3 ☒ • Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water .points = 1 ☐ • Marks of ponding less than 0.5 ft ..... points = 0 ☐	3
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit..... points = 5 ☐ • The area of the basin is 10 to 100 times the area of the unit..... points = 3 ☒ • The area of the basin is more than 100 times the area of the unit ..... points = 0 ☐ • Entire unit is in the FLATS class ..... points = 5 ☐	3
	Total for D 3 *Add the points in the boxes above*	**8**

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems. ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p. 49)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	**16**

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 ☐ _____	1
	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.*	2
	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 ☐** **2**
	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	1

Comments: _____

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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 → **1**

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)

H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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* → **7**

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*** → **14**

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: _____

Wetland name or number E

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): E Date of site visit: 2/4/2014

Rated by: Jim Carsner Trained by Ecology? Yes X No Date of training: 5/2007

SEC: 19 TWNSHP: 24 N RNGE: 1 E Is S/T/R in Appendix D? Yes No X

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 270,000 SF (6.20 ACRE)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	5
Score for Hydrologic Functions	16
Score for Habitat Functions	25
TOTAL Score for Functions	46

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

Final Category (choose the "highest" category from above") III

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	**X**
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	**X**	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.		x
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).		x
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	x	
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.		x

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.

Wetland name or number E

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?
   __X__ The wetland is on a slope *(slope can be very gradual)*.
   __X__ 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.

Wetland name or number E

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2 • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) ..... points = 1 • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ___ **2**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ..... points = 5 • Wetland has persistent, ungrazed vegetation > = 1/2 of area ..... points = 3 • Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 • Wetland has persistent, ungrazed vegetation < 1/10 of area ..... points = 0 **Map of Cowardin vegetation classes**	**Figure** ___ **1**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 **Map of Hydroperiods**	**Figure** ___ **2**
	Total for D 1 *Add the points in the boxes above*	5
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ___ Grazing in the wetland or within 150 ft ___ Untreated stormwater discharges to wetland ___ Tilled fields or orchards within 150 ft. of wetland ___ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ___ Residential, urban areas, golf courses are within 150 ft. of wetland ___ Wetland is fed by groundwater high in phosphorus or nitrogen ___ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier 1
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	5
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2 • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	2
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 • The wetland is a "headwater" wetland ..... points = 5 • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet ..... points = 3 • Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water points = 1 • Marks of ponding less than 0.5 ft ..... points = 0	3
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit ..... points = 5 • The area of the basin is 10 to 100 times the area of the unit ..... points = 3 • The area of the basin is more than 100 times the area of the unit ..... points = 0 • Entire unit is in the FLATS class ..... points = 5	3
	Total for D 3 *Add the points in the boxes above*	8

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ___ Wetland is in a headwater of a river or stream that has flooding problems. _x_ Wetland drains to a river or stream that has flooding problems ___ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ___ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 49)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	16

Comments:

Wetland name or number E

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 • Depressions cover > 1/2 area of wetland ..... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 • No depressions present ..... points = 0	**Figure ___**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 • Trees or shrubs > 1/3 area of the wetland ..... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 53)* Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 • If the ratio is between 10 – 20 ..... points = 6 • If the ratio is 5- <10 ..... points = 4 • If the ratio is 1- <5 ..... points = 2 • If the ratio is < 1 ..... points = 1 **Aerial photo or map showing average widths**	**Figure ___**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 • Vegetation does not meet above criteria ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ____ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ____ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ____ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is 2 **NO** multiplier is 1	*(see p.57)* Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

Comments:

Wetland name or number E

L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the potential to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide ..... points = 6 • Vegetation is more than 16 ft.(5m) wide and < 33 ft ..... points = 3 • Vegetation is more than 6 ft. (2m) wide and < 16 ft ..... points = 1 • Vegetation is less than 6 ft. wide..... points = 0 **Map of Cowardin classes with widths marked**	**Figure ___**
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area..... points = 6 • Cover of herbaceous plants is > 2/3 of the vegetated area..... points = 4 • Cover of herbaceous plants is > 1/3 of the vegetated area..... points = 3 • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit ..... points = 3 • Other vegetation that is not aquatic bed in > 1/3 vegetated area ..... points = 1 • Aquatic bed cover and open water > 2/3 of the unit..... points = 0 **Map with polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
L 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *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.* ____ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ____ Grazing in the wetland or within 150 ft ____ Polluted water discharges to wetland along upland edge ____ Tilled fields or orchards within 150 ft. of wetland ____ Residential or urban areas are within 150 ft. of wetland ____ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ____ Power boats with gasoline or diesel engines use the lake ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p.61)* Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the potential to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide ..... points = 6 • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. ..... points = 4 • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. ..... points = 4 • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed)..... points = 2 • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) ..... points = 0 **Aerial photo or map with Cowardin vegetation classes**	**Figure ___**
	Record the points in the boxes above	
L 4	**Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ____ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ____ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 64)* Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

Comments:

Wetland name or number E

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box) *(see p.64)*
S 1	**Does the wetland have the potential to improve water quality?**	
	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	
	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	
	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 ___**
	Total for S 1 *Add the points in the boxes above*	
S 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 67)*
	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	Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
S 3	**Does the wetland have the potential 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	
	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	
	Add the points in the boxes above	
S 4	**Does the wetland have the opportunity to reduce flooding and erosion?**	*(see p. 70)*
	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	Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	

Comments:

Wetland name or number E

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 potential to provide habitat for many species?**	

H 1.1 Vegetation structure *(see P. 72)*:

Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.

____ Aquatic Bed
____ Emergent plants
__x__ Scrub/shrub (areas where shrubs have > 30% cover)
__x__ 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:
4 structures or more ..... points = 4
2 structures ..... points = 1

Map of Cowardin vegetation classes
3 structures ..... points = 2
1 structure ..... points = 0

Figure ___

1

H 1.2 Hydroperiods *(see p.73)*:

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).

____ Permanently flooded or inundated
__x__ Seasonally flooded or inundated
____ Occasionally flooded or inundated
__x__ Saturated only
__x__ 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**

4 or more types present ..... points = 3
3 or more types present ..... points = 2
2 types present ..... points = 1
1 type present ..... points = 0

Map of hydroperiods

Figure ___

2

H 1.3 Richness of Plant Species *(see p. 75)*:

Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)*
You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.

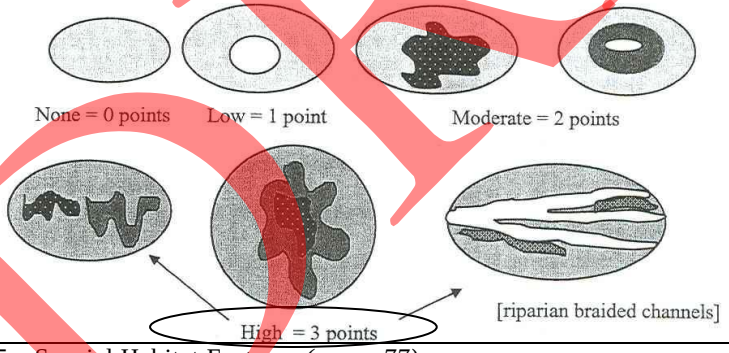
List species below if you want to:

If you counted:
> 19 species ..... points = 2
5 – 19 species ..... points = 1
< 5 species ..... points = 0

1

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 ___

3

H 1.5 Special Habitat Features *(see p. 77)*:

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

__x__ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long)
__x__ Standing snags (diameter at the bottom > 4 inches) in the wetland
__x__ 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)*
__x__ 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.

4

H 1 TOTAL Score – potential for providing habitat — *Add the points in the column above* — 11

Wetland name or number E

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** __x__ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference old logging roads east and north of wetland ..... **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 ___** **4**
	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	2

Comments:

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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*).
_x___ **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*).
_x___ **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.

x 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 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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

5

	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	15
	TOTAL for H 1 from page 8	10
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	25

Comments:

Wetland name or number E

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
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** X	
	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 X or accessed from WNHP/DNR web site _____ **YES** ____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 **NO** X 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**

Wetland name or number E

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** = __X__ 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** __X__ 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** __X__ 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	**NA**

Comments:

Wetland name or number F

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): F Date of site visit: 2/4/2014

Rated by: Jim Carsner Trained by Ecology? Yes X No Date of training: 5/2007

SEC: 19 TWNSHP: 24 N RNGE: 1 E Is S/T/R in Appendix D? Yes No X

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 4,900 SF (0.11 ACRE)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	3
Score for Hydrologic Functions	6
Score for Habitat Functions	19
TOTAL Score for Functions	28

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

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**	**x**
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	**x**	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.		x
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).		x
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		x
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.		x

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.

Wetland name or number F

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?
   __X__ The wetland is on a slope *(slope can be very gradual)*.
   __X__ 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.
   __X__ 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.

Wetland name or number F

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2 • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) ..... points = 1 • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure ___**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ..... points = 5 • Wetland has persistent, ungrazed vegetation > = 1/2 of area ..... points = 3 • Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 • Wetland has persistent, ungrazed vegetation < 1/10 of area ..... points = 0 **Map of Cowardin vegetation classes**	**Figure ___**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 **Map of Hydroperiods**	**Figure ___**
	Total for D 1 *Add the points in the boxes above*	
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ Wetland is fed by groundwater high in phosphorus or nitrogen ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2 • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 • The wetland is a "headwater" wetland ..... points = 5 • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet ..... points = 3 • Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water points = 1 • Marks of ponding less than 0.5 ft ..... points = 0	
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit ..... points = 5 • The area of the basin is 10 to 100 times the area of the unit ..... points = 3 • The area of the basin is more than 100 times the area of the unit ..... points = 0 • Entire unit is in the FLATS class ..... points = 5	
	Total for D 3 *Add the points in the boxes above*	

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ____ Wetland is in a headwater of a river or stream that has flooding problems. ____ Wetland drains to a river or stream that has flooding problems ____ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 49)* Multiplier _____
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	

Comments:

Wetland name or number F

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 • Depressions cover > 1/2 area of wetland ..... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 • No depressions present ..... points = 0	**Figure ___**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 • Trees or shrubs > 1/3 area of the wetland ..... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ___ Grazing in the wetland or within 150 ft ___ Untreated stormwater discharges to wetland ___ Tilled fields or orchards within 150 ft. of wetland ___ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ___ Residential, urban areas, golf courses are within 150 ft. of wetland ___ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ___ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 53)* Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 • If the ratio is between 10 – 20 ..... points = 6 • If the ratio is 5- <10 ..... points = 4 • If the ratio is 1- <5 ..... points = 2 • If the ratio is < 1 ..... points = 1 **Aerial photo or map showing average widths**	**Figure ___**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 • Vegetation does not meet above criteria ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ___ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ___ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ___ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is 2 **NO** multiplier is 1	*(see p.57)* Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

Comments:

Wetland name or number F

L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the potential to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide ..... points = 6 • Vegetation is more than 16 ft.(5m) wide and < 33 ft ..... points = 3 • Vegetation is more than 6 ft. (2m) wide and < 16 ft ..... points = 1 • Vegetation is less than 6 ft. wide..... points = 0 **Map of Cowardin classes with widths marked**	**Figure ___**
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area..... points = 6 • Cover of herbaceous plants is > 2/3 of the vegetated area..... points = 4 • Cover of herbaceous plants is > 1/3 of the vegetated area..... points = 3 • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit ..... points = 3 • Other vegetation that is not aquatic bed in > 1/3 vegetated area ..... points = 1 • Aquatic bed cover and open water > 2/3 of the unit..... points = 0 **Map with polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
L 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *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.* ____ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ____ Grazing in the wetland or within 150 ft ____ Polluted water discharges to wetland along upland edge ____ Tilled fields or orchards within 150 ft. of wetland ____ Residential or urban areas are within 150 ft. of wetland ____ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ____ Power boats with gasoline or diesel engines use the lake ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p.61)* Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the potential to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide ..... points = 6 • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. ..... points = 4 • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. ..... points = 4 • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed)..... points = 2 • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) ..... points = 0 **Aerial photo or map with Cowardin vegetation classes**	**Figure ___**
	Record the points in the boxes above	
L 4	**Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ____ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ____ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 64)* Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

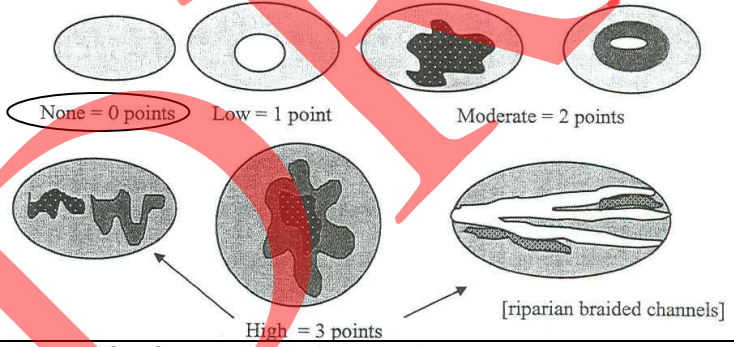
Comments:

Wetland name or number F

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box) *(see p.64)*
S 1	**Does the wetland have the potential to improve water quality?**	
	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 opportunity to improve water quality?** *(see p. 67)* 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	Multiplier 1
◆	**TOTAL – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	3
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
S 3	**Does the wetland have the potential 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	0
	Add the points in the boxes above	3
S 4	**Does the wetland have the opportunity to reduce flooding and erosion?** *(see p. 70)* 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.* __x__ 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	Multiplier 2
◆	**TOTAL – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	6

Comments:

Wetland name or number F

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) __x__ 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:* 4 structures or more ..... points = 4 2 structures ..... points = 1 **Map of Cowardin vegetation classes** 3 structures ..... points = 2 1 structure ..... points = 0	**Figure ___** **0**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ____ Permanently flooded or inundated ____ Seasonally flooded or inundated ____ Occasionally flooded or inundated __x__ Saturated only __x__ 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** 4 or more types present points = 3 3 or more types present ..... points = 2 2 types present ..... points = 1 1 type present ..... points = 0 **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.* List species below if you want to: If you counted: > 19 species ..... points = 2 5 – 19 species ..... points = 1 < 5 species ..... points = 0	1
	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 ___** **0**
	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.* __x__ 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 __x__ 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)* __x__ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	3
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	5

Wetland name or number F

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** __X__ 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	2

Comments:

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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*).
_x___ **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*).
_X__ **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.
_x___ **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 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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

5

	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	14
	TOTAL for H 1 from page 8	5
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	19

Comments:

Wetland name or number F

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
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** X	
	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 x or accessed from WNHP/DNR web site _____ **YES** ____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 **NO** x 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** = __X__ 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** __X__ 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** __X__ 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	**NA**

Comments:

Wetland name or number G

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): G Date of site visit: 2/5/2014

Rated by: Jim Carsner Trained by Ecology? Yes X No Date of training: 5/2007

SEC: 19 TWNSHP: 24 N RNGE: 1 E Is S/T/R in Appendix D? Yes No X

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 1,600 SF (0.04 ACRE)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	3
Score for Hydrologic Functions	2
Score for Habitat Functions	17
TOTAL Score for Functions	22

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

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

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics	
Estuarine	
Natural Heritage Wetland	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	**x**

Wetland HGM Class used for Rating	
Depressional	
Riverine	
Lake-fringe	
Slope	**x**
Flats	
Freshwater Tidal	
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.		x
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).		x
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		x
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.		x

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.

Wetland name or number G

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?
   __X__ The wetland is on a slope *(slope can be very gradual)*.
   __X__ 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.
   __X__ 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.

Wetland name or number G

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2 • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) ..... points = 1 • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure ___**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ..... points = 5 • Wetland has persistent, ungrazed vegetation > = 1/2 of area ..... points = 3 • Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 • Wetland has persistent, ungrazed vegetation < 1/10 of area ..... points = 0 **Map of Cowardin vegetation classes**	**Figure ___**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 **Map of Hydroperiods**	**Figure ___**
	Total for D 1 *Add the points in the boxes above*	
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ Wetland is fed by groundwater high in phosphorus or nitrogen ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2 • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 • The wetland is a "headwater" wetland ..... points = 5 • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet ..... points = 3 • Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water points = 1 • Marks of ponding less than 0.5 ft ..... points = 0	
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit ..... points = 5 • The area of the basin is 10 to 100 times the area of the unit ..... points = 3 • The area of the basin is more than 100 times the area of the unit ..... points = 0 • Entire unit is in the FLATS class ..... points = 5	
	Total for D 3 *Add the points in the boxes above*	

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ____ Wetland is in a headwater of a river or stream that has flooding problems. ____ Wetland drains to a river or stream that has flooding problems ____ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 49)* Multiplier _____
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	

Comments:

Wetland name or number G

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 • Depressions cover > 1/2 area of wetland ..... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 • No depressions present ..... points = 0	**Figure ___**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 • Trees or shrubs > 1/3 area of the wetland ..... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 53)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 • If the ratio is between 10 – 20 ..... points = 6 • If the ratio is 5- <10 ..... points = 4 • If the ratio is 1- <5 ..... points = 2 • If the ratio is < 1 ..... points = 1 **Aerial photo or map showing average widths**	**Figure ___**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 • Vegetation does not meet above criteria ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?**	*(see p.57)*
	Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ____ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ____ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ____ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

Comments:

Wetland name or number G

L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the potential to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide ..... points = 6 • Vegetation is more than 16 ft.(5m) wide and < 33 ft ..... points = 3 • Vegetation is more than 6 ft. (2m) wide and < 16 ft ..... points = 1 • Vegetation is less than 6 ft. wide..... points = 0 **Map of Cowardin classes with widths marked**	**Figure ___**
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area..... points = 6 • Cover of herbaceous plants is > 2/3 of the vegetated area..... points = 4 • Cover of herbaceous plants is > 1/3 of the vegetated area..... points = 3 • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit ..... points = 3 • Other vegetation that is not aquatic bed in > 1/3 vegetated area ..... points = 1 • Aquatic bed cover and open water > 2/3 of the unit..... points = 0 **Map with polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
L 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *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.* ____ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ____ Grazing in the wetland or within 150 ft ____ Polluted water discharges to wetland along upland edge ____ Tilled fields or orchards within 150 ft. of wetland ____ Residential or urban areas are within 150 ft. of wetland ____ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ____ Power boats with gasoline or diesel engines use the lake ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p.61)* Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the potential to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide ..... points = 6 • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. ..... points = 4 • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. ..... points = 4 • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed)..... points = 2 • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) ..... points = 0 **Aerial photo or map with Cowardin vegetation classes**	**Figure ___**
	Record the points in the boxes above	
L 4	**Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ____ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ____ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 64)* Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

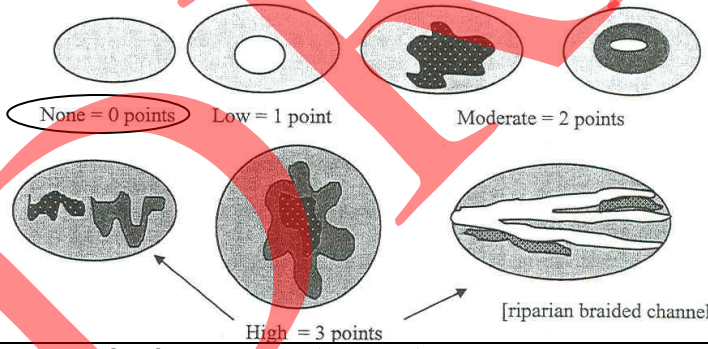
Comments:

Wetland name or number G

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box) *(see p.64)*
S 1	**Does the wetland have the potential to improve water quality?**	
	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 opportunity to improve water quality?**	*(see p. 67)*
	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	Multiplier 1
◆	**TOTAL – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	3
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
S 3	**Does the wetland have the potential 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	1
	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	0
	Add the points in the boxes above	1
S 4	**Does the wetland have the opportunity to reduce flooding and erosion?**	*(see p. 70)*
	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.* __x__ 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	Multiplier 2
◆	**TOTAL – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	2

Comments:

Wetland name or number G

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 potential to provide habitat for many species?**	
	H 1.1 Vegetation structure *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____ Aquatic Bed ____ Emergent plants __x__ 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:* 4 structures or more ..... points = 4 2 structures ..... points = 1 **Map of Cowardin vegetation classes** 3 structures ..... points = 2 1 structure ..... points = 0	**Figure ___** **0**
	H 1.2 Hydroperiods *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ____ Permanently flooded or inundated ____ Seasonally flooded or inundated ____ Occasionally flooded or inundated __x__ Saturated only __x__ 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** 4 or more types present points = 3 3 or more types present ..... points = 2 2 types present ..... points = 1 1 type present ..... points = 0 **Map of hydroperiods**	**Figure ___** **1**
	H 1.3 Richness of Plant Species *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* List species below if you want to: If you counted: > 19 species ..... points = 2 5 – 19 species ..... points = 1 < 5 species ..... points = 0	0
	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 ___** **0**
	H 1.5 Special Habitat Features *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____ Large, downed, woody debris within the wetland (> 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)* __x__ 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*	2

Wetland name or number G

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 ___** **4**
	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	2

Comments:

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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*).
_x_ **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*).
_x_ **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.
_x_ **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 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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

5

	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	15
	TOTAL for H 1 from page 8	2
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	17

Comments:

Wetland name or number G

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** X	
	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 x or accessed from WNHP/DNR web site _____ **YES** ____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 **NO** x 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**

Wetland name or number G

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** = __X__ 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** __X__ 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** __X__ 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	**NA**

Comments:

Wetland name or number H

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): H Date of site visit: 2/5/2014

Rated by: Jim Carsner Trained by Ecology? Yes X No Date of training: 5/2007

SEC: 19 TWNSHP: 24 N RNGE: 1 E Is S/T/R in Appendix D? Yes No x

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 1,750 SF (0.04 ACRE)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	1
Score for Hydrologic Functions	2
Score for Habitat Functions	17
TOTAL Score for Functions	20

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

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

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics	
Estuarine	
Natural Heritage Wetland	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	**x**

Wetland HGM Class used for Rating	
Depressional	
Riverine	
Lake-fringe	
Slope	**x**
Flats	
Freshwater Tidal	
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.		x
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).		x
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		x
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.		x

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.

Wetland name or number H

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?
   __X__ The wetland is on a slope *(slope can be very gradual)*.
   __X__ 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.
   __X__ 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.

Wetland name or number H

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2 • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) ..... points = 1 • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure ___**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ..... points = 5 • Wetland has persistent, ungrazed vegetation > = 1/2 of area ..... points = 3 • Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 • Wetland has persistent, ungrazed vegetation < 1/10 of area ..... points = 0 **Map of Cowardin vegetation classes**	**Figure ___**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 **Map of Hydroperiods**	**Figure ___**
	Total for D 1 *Add the points in the boxes above*	
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ Wetland is fed by groundwater high in phosphorus or nitrogen ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2 • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 • The wetland is a "headwater" wetland ..... points = 5 • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet ..... points = 3 • Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water points = 1 • Marks of ponding less than 0.5 ft ..... points = 0	
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit ..... points = 5 • The area of the basin is 10 to 100 times the area of the unit ..... points = 3 • The area of the basin is more than 100 times the area of the unit ..... points = 0 • Entire unit is in the FLATS class ..... points = 5	
	Total for D 3 *Add the points in the boxes above*	

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ____ Wetland is in a headwater of a river or stream that has flooding problems. ____ Wetland drains to a river or stream that has flooding problems ____ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 49)* Multiplier _____
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	

Comments:

Wetland name or number H

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 • Depressions cover > 1/2 area of wetland ..... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 • No depressions present ..... points = 0	**Figure ___**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 • Trees or shrubs > 1/3 area of the wetland ..... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 53)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ___ Grazing in the wetland or within 150 ft ___ Untreated stormwater discharges to wetland ___ Tilled fields or orchards within 150 ft. of wetland ___ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ___ Residential, urban areas, golf courses are within 150 ft. of wetland ___ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ___ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 • If the ratio is between 10 – 20 ..... points = 6 • If the ratio is 5- <10 ..... points = 4 • If the ratio is 1- <5 ..... points = 2 • If the ratio is < 1 ..... points = 1 **Aerial photo or map showing average widths**	**Figure ___**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 • Vegetation does not meet above criteria ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?**	*(see p.57)*
	Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ___ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ___ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ___ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

Comments:

Wetland name or number H

L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the potential to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide ..... points = 6 • Vegetation is more than 16 ft.(5m) wide and < 33 ft ..... points = 3 • Vegetation is more than 6 ft. (2m) wide and < 16 ft ..... points = 1 • Vegetation is less than 6 ft. wide..... points = 0 **Map of Cowardin classes with widths marked**	**Figure ___**
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area..... points = 6 • Cover of herbaceous plants is > 2/3 of the vegetated area..... points = 4 • Cover of herbaceous plants is > 1/3 of the vegetated area..... points = 3 • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit ..... points = 3 • Other vegetation that is not aquatic bed in > 1/3 vegetated area ..... points = 1 • Aquatic bed cover and open water > 2/3 of the unit..... points = 0 **Map with polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
L 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *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.* ____ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ____ Grazing in the wetland or within 150 ft ____ Polluted water discharges to wetland along upland edge ____ Tilled fields or orchards within 150 ft. of wetland ____ Residential or urban areas are within 150 ft. of wetland ____ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ____ Power boats with gasoline or diesel engines use the lake ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p.61)* Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the potential to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide ..... points = 6 • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. ..... points = 4 • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. ..... points = 4 • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed)..... points = 2 • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) ..... points = 0 **Aerial photo or map with Cowardin vegetation classes**	**Figure ___**
	Record the points in the boxes above	
L 4	**Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ____ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ____ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 64)* Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

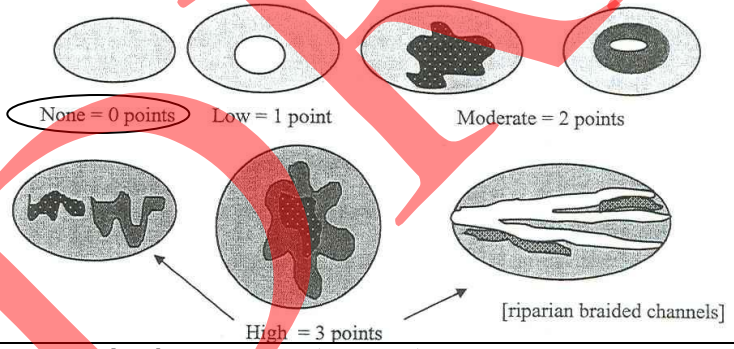
Comments:

Wetland name or number H

S	Slope Wetlands	Points (only 1 score per box) (see p.64)
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	
S 1	**Does the wetland have the potential to improve water quality?**	
	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 ___** **0**
	Total for S 1 *Add the points in the boxes above*	1
S 2	**Does the wetland have the opportunity to improve water quality?** *(see p. 67)* 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	Multiplier 1
◆	**TOTAL – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	1
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
S 3	**Does the wetland have the potential 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	0
	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	0
	Add the points in the boxes above	0
S 4	**Does the wetland have the opportunity to reduce flooding and erosion?** *(see p. 70)* 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.* __x__ 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	Multiplier 2
◆	**TOTAL – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	0

Comments:

Wetland name or number H

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.		**Points** (only 1 score per box)
H 1	**Does the wetland have the potential to provide habitat for many species?**	
	H 1.1 Vegetation structure *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____ Aquatic Bed ____ Emergent plants __x__ 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:* 4 structures or more ..... points = 4 2 structures ..... points = 1 **Map of Cowardin vegetation classes** 3 structures ..... points = 2 1 structure ..... points = 0	**Figure ___** **0**
	H 1.2 Hydroperiods *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ____ Permanently flooded or inundated ____ Seasonally flooded or inundated ____ Occasionally flooded or inundated __x__ Saturated only __x__ 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** 4 or more types present points = 3 3 or more types present ..... points = 2 2 types present ..... points = 1 1 type present ..... points = 0 **Map of hydroperiods**	**Figure ___** **1**
	H 1.3 Richness of Plant Species *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* List species below if you want to: If you counted: > 19 species ..... points = 2 5 – 19 species ..... points = 1 < 5 species ..... points = 0	0
	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 ___** **0**
	H 1.5 Special Habitat Features *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____ Large, downed, woody debris within the wetland (> 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)* __x__ 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*	2

Wetland name or number H

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 ___** **4**
	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	2

Comments:

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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*).
_x___ **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*).
_x___ **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.
_x___ **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 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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

5

	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	15
	TOTAL for H 1 from page 8	2
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	17

Comments:

Wetland name or number H

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** X	
	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 x or accessed from WNHP/DNR web site _____ **YES** ____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 **NO** x 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**

Wetland name or number H

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** = __X__ 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** __X__ 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** __X__ 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	**NA**

Comments:

Wetland name or number I

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): I Date of site visit: 2/5/2014

Rated by: Jim Carsner Trained by Ecology? Yes X No Date of training: 5/2007

SEC: 19 TWNSHP: 24 N RNGE: 1 E Is S/T/R in Appendix D? Yes No X

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 1,873 SF (0.04 ACRE)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	3
Score for Hydrologic Functions	6
Score for Habitat Functions	18
TOTAL Score for Functions	27

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

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**	**x**
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	**x**	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.		x
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).		x
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		x
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.		x

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.

Wetland name or number I

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?
   __X__ The wetland is on a slope *(slope can be very gradual)*.
   __X__ 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.
   __X__ 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.

Wetland name or number I _

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the <u>potential</u> to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2 • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) ..... points = 1 • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure ___**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ..... points = 5 • Wetland has persistent, ungrazed vegetation > = 1/2 of area ..... points = 3 • Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 • Wetland has persistent, ungrazed vegetation < 1/10 of area ..... points = 0 **Map of Cowardin vegetation classes**	**Figure ___**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 **Map of Hydroperiods**	**Figure ___**
	Total for D 1 *Add the points in the boxes above*	
D 2	**Does the wetland have the <u>opportunity</u> to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ Wetland is fed by groundwater high in phosphorus or nitrogen ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the <u>potential</u> to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2 • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 • The wetland is a "headwater" wetland ..... points = 5 • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet ..... points = 3 • Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water points = 1 • Marks of ponding less than 0.5 ft ..... points = 0	
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit ..... points = 5 • The area of the basin is 10 to 100 times the area of the unit ..... points = 3 • The area of the basin is more than 100 times the area of the unit ..... points = 0 • Entire unit is in the FLATS class ..... points = 5	
	Total for D 3 *Add the points in the boxes above*	

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ____ Wetland is in a headwater of a river or stream that has flooding problems. ____ Wetland drains to a river or stream that has flooding problems ____ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 49)* Multiplier _____
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	

Comments:

Wetland name or number I

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 • Depressions cover > 1/2 area of wetland ..... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 • No depressions present ..... points = 0	**Figure ___**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 • Trees or shrubs > 1/3 area of the wetland ..... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 53)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ___ Grazing in the wetland or within 150 ft ___ Untreated stormwater discharges to wetland ___ Tilled fields or orchards within 150 ft. of wetland ___ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ___ Residential, urban areas, golf courses are within 150 ft. of wetland ___ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ___ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 • If the ratio is between 10 – 20 ..... points = 6 • If the ratio is 5- <10 ..... points = 4 • If the ratio is 1- <5 ..... points = 2 • If the ratio is < 1 ..... points = 1 **Aerial photo or map showing average widths**	**Figure ___**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 • Vegetation does not meet above criteria ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?**	*(see p.57)*
	Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ___ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ___ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ___ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

Comments:

Wetland name or number I

L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the potential to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide ..... points = 6 • Vegetation is more than 16 ft.(5m) wide and < 33 ft ..... points = 3 • Vegetation is more than 6 ft. (2m) wide and < 16 ft ..... points = 1 • Vegetation is less than 6 ft. wide..... points = 0 **Map of Cowardin classes with widths marked**	**Figure ___**
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area..... points = 6 • Cover of herbaceous plants is > 2/3 of the vegetated area..... points = 4 • Cover of herbaceous plants is > 1/3 of the vegetated area..... points = 3 • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit ..... points = 3 • Other vegetation that is not aquatic bed in > 1/3 vegetated area ..... points = 1 • Aquatic bed cover and open water > 2/3 of the unit..... points = 0 **Map with polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
L 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *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.* ____ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ____ Grazing in the wetland or within 150 ft ____ Polluted water discharges to wetland along upland edge ____ Tilled fields or orchards within 150 ft. of wetland ____ Residential or urban areas are within 150 ft. of wetland ____ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ____ Power boats with gasoline or diesel engines use the lake ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p.61)* Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the potential to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide ..... points = 6 • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. ..... points = 4 • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. ..... points = 4 • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed)..... points = 2 • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) ..... points = 0 **Aerial photo or map with Cowardin vegetation classes**	**Figure ___**
	Record the points in the boxes above	
L 4	**Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ____ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ____ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 64)* Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

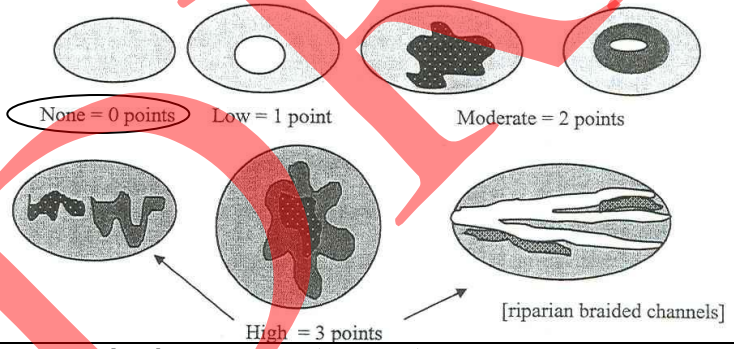
Comments:

Wetland name or number I

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 potential 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 opportunity 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 1
◆	**TOTAL – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	3
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
S 3	**Does the wetland have the potential 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	0
	Add the points in the boxes above	3
S 4	**Does the wetland have the opportunity 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.* __x__ Wetland has surface runoff that drains to a river or stream that has flooding problems ___ Other _____ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 70)* Multiplier 2
◆	**TOTAL – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	6

Comments:

Wetland name or number I _

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.		**Points** (only 1 score per box)
H 1	**Does the wetland have the potential to provide habitat for many species?**	
	H 1.1 Vegetation structure *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____ Aquatic Bed ____ Emergent plants __x__ 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:* 4 structures or more ..... points = 4 2 structures ..... points = 1 **Map of Cowardin vegetation classes** 3 structures ..... points = 2 1 structure ..... points = 0	**Figure ___** **0**
	H 1.2 Hydroperiods *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ____ Permanently flooded or inundated ____ Seasonally flooded or inundated ____ Occasionally flooded or inundated __x__ Saturated only __x__ 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** 4 or more types present points = 3 3 or more types present ..... points = 2 2 types present ..... points = 1 1 type present ..... points = 0 **Map of hydroperiods**	**Figure ___** **1**
	H 1.3 Richness of Plant Species *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* If you counted: > 19 species ..... points = 2 5 – 19 species ..... points = 1 < 5 species ..... points = 0 List species below if you want to: _____ _____ _____ _____	1
	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 ___** **0**
	H 1.5 Special Habitat Features *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____ Large, downed, woody debris within the wetland (> 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)* __x__ 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*	3

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 ___** **4**
	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	2

Comments:

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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*).
_x___ **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*).
_x___ **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.
_x___ **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 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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

5

	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	15
	TOTAL for H 1 from page 8	3
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	18

Comments:

Wetland name or number I

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** X	
	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 X or accessed from WNHP/DNR web site _____ **YES** ____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 **NO** X 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**

Wetland name or number 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** = __X__ 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** __X__ 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** __X__ 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	**NA**

Comments:

Wetland name or number J

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): J Date of site visit: 2/5-6/2014

Rated by: Jim Carsner Trained by Ecology? Yes X No Date of training: 5/2007

SEC: 19 TWNSHP: 24 N RNGE: 1 E Is S/T/R in Appendix D? Yes No X

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 1,351 SF (0.03 ACRE)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	5
Score for Hydrologic Functions	20
Score for Habitat Functions	12
TOTAL Score for Functions	37

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

Final Category (choose the "highest" category from above") III

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics	
Estuarine	
Natural Heritage Wetland	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	**X**

Wetland HGM Class used for Rating	
Depressional	**X**
Riverine	
Lake-fringe	
Slope	
Flats	
Freshwater Tidal	
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.		x
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).		x
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		x
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.		x

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.

Wetland name or number J

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?
   __X__ The wetland is on a slope *(slope can be very gradual)*.
   __X__ 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.

Wetland name or number J

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2 • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) ..... points = 1 • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ___ **3**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ..... points = 5 • Wetland has persistent, ungrazed vegetation > = 1/2 of area ..... points = 3 • Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 • Wetland has persistent, ungrazed vegetation < 1/10 of area (vegetation less than 6") ..... points = 0 **Map of Cowardin vegetation classes**	**Figure** ___ **0**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 **Map of Hydroperiods**	**Figure** ___ **2**
	Total for D 1 *Add the points in the boxes above*	5
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ___ Grazing in the wetland or within 150 ft ___ Untreated stormwater discharges to wetland ___ Tilled fields or orchards within 150 ft. of wetland ___ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ___ Residential, urban areas, golf courses are within 150 ft. of wetland ___ Wetland is fed by groundwater high in phosphorus or nitrogen ___ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier 1
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	5
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2 • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	4
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 • The wetland is a "headwater" wetland ..... points = 5 • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet ..... points = 3 • Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water points = 1 • Marks of ponding less than 0.5 ft ..... points = 0	3
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit ..... points = 5 • The area of the basin is 10 to 100 times the area of the unit ..... points = 3 • The area of the basin is more than 100 times the area of the unit ..... points = 0 • Entire unit is in the FLATS class ..... points = 5	3
	Total for D 3 *Add the points in the boxes above*	10

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** *(see p. 49)* Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ___ Wetland is in a headwater of a river or stream that has flooding problems. _x_ Wetland drains to a river or stream that has flooding problems ___ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ___ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	20

Comments:

Wetland name or number J

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 • Depressions cover > 1/2 area of wetland ..... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 • No depressions present ..... points = 0	**Figure ___**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 • Trees or shrubs > 1/3 area of the wetland ..... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 53)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 • If the ratio is between 10 – 20 ..... points = 6 • If the ratio is 5- <10 ..... points = 4 • If the ratio is 1- <5 ..... points = 2 • If the ratio is < 1 ..... points = 1 **Aerial photo or map showing average widths**	**Figure ___**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 • Vegetation does not meet above criteria ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?**	*(see p.57)*
	Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ____ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ____ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ____ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

Comments:

Wetland name or number J

L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the potential to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide ..... points = 6 • Vegetation is more than 16 ft.(5m) wide and < 33 ft ..... points = 3 • Vegetation is more than 6 ft. (2m) wide and < 16 ft ..... points = 1 • Vegetation is less than 6 ft. wide..... points = 0 **Map of Cowardin classes with widths marked**	**Figure ___**
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area..... points = 6 • Cover of herbaceous plants is > 2/3 of the vegetated area..... points = 4 • Cover of herbaceous plants is > 1/3 of the vegetated area..... points = 3 • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit ..... points = 3 • Other vegetation that is not aquatic bed in > 1/3 vegetated area ..... points = 1 • Aquatic bed cover and open water > 2/3 of the unit..... points = 0 **Map with polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
L 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *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.* ____ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ____ Grazing in the wetland or within 150 ft ____ Polluted water discharges to wetland along upland edge ____ Tilled fields or orchards within 150 ft. of wetland ____ Residential or urban areas are within 150 ft. of wetland ____ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ____ Power boats with gasoline or diesel engines use the lake ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p.61)* Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the potential to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide ..... points = 6 • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. ..... points = 4 • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. ..... points = 4 • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed)..... points = 2 • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) ..... points = 0 **Aerial photo or map with Cowardin vegetation classes**	**Figure ___**
	Record the points in the boxes above	
L 4	**Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ____ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ____ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 64)* Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

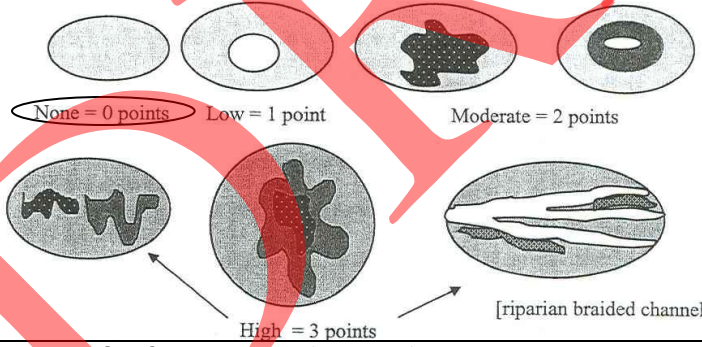
Comments:

Wetland name or number J

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box) *(see p.64)*
S 1	**Does the wetland have the <u>potential</u> to improve water quality?**	
	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	
	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	
	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 ___**
	Total for S 1 *Add the points in the boxes above*	
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 _____
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	
	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	
	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	
	Add the points in the boxes above	
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 _____
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	

Comments:

Wetland name or number J

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.		**Points** (only 1 score per box)
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 __x__ 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:* 4 structures or more ..... points = 4 2 structures ..... points = 1 **Map of Cowardin vegetation classes** 3 structures ..... points = 2 1 structure ..... points = 0	**Figure ___** **0**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ____ Permanently flooded or inundated __x__ Seasonally flooded or inundated ____ Occasionally flooded or inundated ____ Saturated only ____ 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** 4 or more types present points = 3 3 or more types present ..... points = 2 2 types present ..... points = 1 1 type present ..... points = 0 **Map of hydroperiods**	**Figure ___** **0**
	H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* List species below if you want to: If you counted: > 19 species ..... points = 2 5 – 19 species ..... points = 1 < 5 species ..... points = 0	0
	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 ___** **0**
	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)* __x__ 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*	1

Wetland name or number J

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** __x__ 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	2

Comments:

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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.
X **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)

1

H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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

5

	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	11
	TOTAL for H 1 from page 8	1
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	12

Comments:

Wetland name or number J

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** X	
	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 X or accessed from WNHP/DNR web site _____ **YES** ____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 **NO** X 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** = __X__ 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** __X__ 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** __X__ 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	**NA**

Comments:

Wetland name or number K / L

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): K / L Date of site visit: 2/6/2014

Rated by: Jim Carsner Trained by Ecology? Yes X No Date of training: 5/2007

SEC: 19 TWNSHP: 24 N RNGE: 1 E Is S/T/R in Appendix D? Yes No X

Map of wetland unit: Figure REPORT - APPENDIX C Estimated size 95,805 SF (2.20 ACRE)

SUMMARY OF RATING

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

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	5
Score for Hydrologic Functions	10
Score for Habitat Functions	22
TOTAL Score for Functions	37

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

Final Category (choose the "highest" category from above") III

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics	
Estuarine	
Natural Heritage Wetland	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	**X**

Wetland HGM Class used for Rating	
Depressional	**X**
Riverine	
Lake-fringe	
Slope	
Flats	
Freshwater Tidal	
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.		x
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).		x
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		x
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.		x

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.

Wetland name or number K / L

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?
   X The wetland is on a slope *(slope can be very gradual)*.
   X 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.

Wetland name or number K / L

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2 • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) ..... points = 1 • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ___ **2**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ..... points = 5 • Wetland has persistent, ungrazed vegetation > = 1/2 of area ..... points = 3 • Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 • Wetland has persistent, ungrazed vegetation < 1/10 of area ..... points = 0 **Map of Cowardin vegetation classes**	**Figure** ___ **1**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 **Map of Hydroperiods**	**Figure** ___ **2**
	Total for D 1 *Add the points in the boxes above*	5
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ___ Grazing in the wetland or within 150 ft ___ Untreated stormwater discharges to wetland ___ Tilled fields or orchards within 150 ft. of wetland ___ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ___ Residential, urban areas, golf courses are within 150 ft. of wetland ___ Wetland is fed by groundwater high in phosphorus or nitrogen ___ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier 1
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	5
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2 • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	2
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 • The wetland is a "headwater" wetland ..... points = 5 • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ..... points = 5 • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet ..... points = 3 • Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water ..... points = 1 • Marks of ponding less than 0.5 ft ..... points = 0	0
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit ..... points = 5 • The area of the basin is 10 to 100 times the area of the unit ..... points = 3 • The area of the basin is more than 100 times the area of the unit ..... points = 0 • Entire unit is in the FLATS class ..... points = 5	3
	Total for D 3 *Add the points in the boxes above*	5

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ___ Wetland is in a headwater of a river or stream that has flooding problems. _x_ Wetland drains to a river or stream that has flooding problems ___ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ___ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 49)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	10

Comments:

Wetland name or number K / L

R	Riverine and Freshwater Tidal Fringe Wetlands	Points (only 1 score per box)
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 • Depressions cover > 1/2 area of wetland ..... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 • No depressions present ..... points = 0	**Figure ___**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 • Trees or shrubs > 1/3 area of the wetland ..... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 53)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 • If the ratio is between 10 – 20 ..... points = 6 • If the ratio is 5- <10 ..... points = 4 • If the ratio is 1- <5 ..... points = 2 • If the ratio is < 1 ..... points = 1 **Aerial photo or map showing average widths**	**Figure ___**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 • Vegetation does not meet above criteria ..... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?**	*(see p.57)*
	Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ____ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ____ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ____ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is 2 **NO** multiplier is 1	Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

Comments:

Wetland name or number K / L

L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the potential to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide ..... points = 6 • Vegetation is more than 16 ft.(5m) wide and < 33 ft ..... points = 3 • Vegetation is more than 6 ft. (2m) wide and < 16 ft ..... points = 1 • Vegetation is less than 6 ft. wide..... points = 0 **Map of Cowardin classes with widths marked**	**Figure ___**
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area..... points = 6 • Cover of herbaceous plants is > 2/3 of the vegetated area..... points = 4 • Cover of herbaceous plants is > 1/3 of the vegetated area..... points = 3 • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit ..... points = 3 • Other vegetation that is not aquatic bed in > 1/3 vegetated area ..... points = 1 • Aquatic bed cover and open water > 2/3 of the unit..... points = 0 **Map with polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
L 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *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.* ____ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ____ Grazing in the wetland or within 150 ft ____ Polluted water discharges to wetland along upland edge ____ Tilled fields or orchards within 150 ft. of wetland ____ Residential or urban areas are within 150 ft. of wetland ____ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ____ Power boats with gasoline or diesel engines use the lake ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p.61)* Multiplier _____
◆	**TOTAL – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the potential to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide ..... points = 6 • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. ..... points = 4 • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. ..... points = 4 • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed)..... points = 2 • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) ..... points = 0 **Aerial photo or map with Cowardin vegetation classes**	**Figure ___**
	Record the points in the boxes above	
L 4	**Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ____ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ____ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ____ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 64)* Multiplier _____
◆	**TOTAL – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

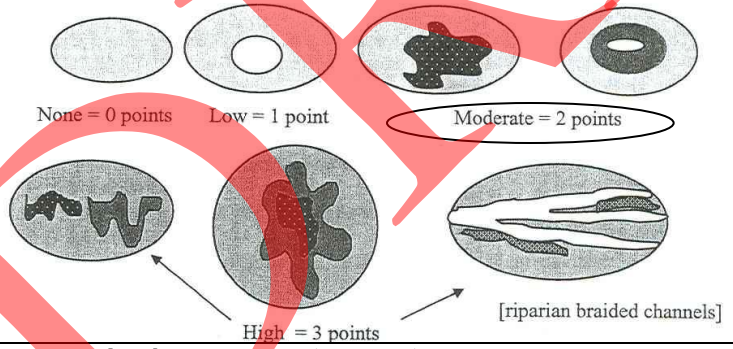
Comments:

Wetland name or number K / L

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box) *(see p.64)*
S 1	**Does the wetland have the <u>potential</u> to improve water quality?**	
	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	
	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	
	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 ___**
	Total for S 1 *Add the points in the boxes above*	
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 _____
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	
	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	
	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	
	Add the points in the boxes above	
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 _____
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	

Comments:

Wetland name or number K / L

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.		Points (only 1 score per box)
H 1	**Does the wetland have the potential to provide habitat for many species?**	
	H 1.1 Vegetation structure *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____ Aquatic Bed __x__ Emergent plants __x__ Scrub/shrub (areas where shrubs have > 30% cover) __x__ Forested (areas where trees have > 30% cover) *If the unit has a forested class check if:* __x__ 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:* 4 structures or more ..... points = 4 2 structures ..... points = 1 **Map of Cowardin vegetation classes** 3 structures ..... points = 2 1 structure ..... points = 0	**Figure ___** **4**
	H 1.2 Hydroperiods *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* __x__ Permanently flooded or inundated ____ Seasonally flooded or inundated ____ Occasionally flooded or inundated __x__ Saturated only ____ 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** 4 or more types present points = 3 3 or more types present ..... points = 2 2 types present ..... points = 1 1 type present ..... points = 0 **Map of hydroperiods**	**Figure ___** **1**
	H 1.3 Richness of Plant Species *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* List species below if you want to: If you counted: > 19 species ..... points = 2 5 – 19 species ..... points = 1 < 5 species ..... points = 0	1
	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 Special Habitat Features *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* __x__ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) __x__ 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)* __x__ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	3
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	11

Wetland name or number K / L

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** __x__ 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	2

Comments:

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(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 330 ft. (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%; 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.

X **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)

1

H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 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

5

	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	11
	TOTAL for H 1 from page 8	11
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	22

Comments:

Wetland name or number K / L

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** X	
	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 X or accessed from WNHP/DNR web site _____ **YES** _____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 **NO** X 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**

Wetland name or number K / L

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** = __X__ 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** __X__ 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** __X__ 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	**NA**

Comments:

Appendix F — Geotechnical Report

Appendix G — Qualifications

Jeremy Downs, Principal Scientist and Environmental Planner

Jeremy Downs is the Principal Scientist and Environmental Planner for the project with professional training and extensive experience in land use, site planning and design, project coordination, permitting and management, marine and wetland ecology, habitat restoration, wetland, stream, and benthic delineations and assessments, stream assessments, underwater and terrestrial monitoring programs, and mitigation planning and design since 1987.

Jeremy earned a Bachelor's of Science degree in Biology from the University of California, Davis. In addition, he studied under the Environmental Risk and Recovery program at the Australian Institute of Marine Science. He also holds graduate-level professional certifications in various advanced wetland science and management programs from both Portland State University and San Francisco State University, and he has received professional training in Salmonid Biology from the University of California Extension.

Jeremy has been formally trained in the use of the Washington State Wetland Rating System, Determination of Ordinary High Water Mark, Designing Compensatory Mitigation and Restoration Projects, and Reviewing Wetland Mitigation and Monitoring Plans from the US Army Corps of Engineers and Washington State Department of Ecology, and in conducting Biological Assessments from the Washington Department of Transportation. He is also a Pierce County Qualified Wetland Specialist and Fisheries Biologist, and he holds similar qualifications from other jurisdictions.

James H. Carsner, Senior Scientist

Jim Carsner, a certified Professional Wetland Scientist (#1461) with professional training and extensive experience in planning and design, project coordination, permitting and management, aquatic and wetland ecology, habitat restoration, wetland, stream, and benthic delineations and assessments, stream assessments, and mitigation planning and monitoring since 1979. Jim earned a Bachelor's of Science degree from the University of Washington, College of Fisheries and undertook post-graduate studies in wetland ecology at Portland State University. He has served on the Board of Directors of the Washington State Weed Association and instructed courses on pesticide laws, regulations, and uses.

Jim has been formally trained in the use of the Washington State Wetland Rating System, Determination of Ordinary High Water Mark, Designing Compensatory Mitigation and Restoration Projects, and Reviewing Wetland Mitigation and Monitoring Plans from the US Army Corps of Engineers and Washington State Department of Ecology. He is also a Pierce County Qualified Wetland Specialist and Fisheries Biologist, and he holds similar qualifications from other jurisdictions.

Railin Santiago, Environmental Scientist

Railin Santiago is a professional Environmental Scientist with background in both fresh water and marine ecology. She has experience in fisheries management, assessing marine, shoreline, stream, and wetland systems, conducting biological evaluations, documentation and coordination of ESA, MSA, and NEPA compliance efforts, NPDES compliance, Geographical Information Systems (GIS) mapping and analysis, and regulatory coordination and permitting. Railin earned a Bachelor's of Science degree from the Evergreen State College, Olympia and a Master's in Marine and Environmental Affairs from the University of Washington, Seattle.

In addition, she has received formal training in the National Environmental Policy Act (NEPA), GIS for Fisheries and Wildlife Biology Applications, Determining Ordinary High Water, Habitat Restoration, NPDES Phase I and II stormwater monitoring, and various other data analysis and regulatory subjects. For a list of representative projects, please contact her at Soundview Consultants LLC.

ENVIRON

April 22, 2014

MEMORANDUM

To:	Mark Mauren, UTF	ENVIRON Project No: 2934453A	
CC:	Molly Adolfson, ESA		
From:	Kristen Wallace	Project Name:	UTF MRD Project Revision Supplemental EIS

Subject: Revised Noise Impact Assessment

This memo addresses potential noise effects of proposed revisions to the planned Ueland Tree Farm (UTF) Mineral Resource Development (MRD) in support of a Supplemental EIS. In addition to addressing the proposed revisions, ENVIRON was asked to consider the noise implications of allowing periodic nighttime trucking of materials to support major projects, such as roadway construction. We have therefore included a discussion of the assessment of nighttime trucking in this memorandum.

REVISIONS TO PROJECT PROPOSAL

The approved UTF MRD Project proposes development of commercial sand, gravel, and basalt mines on the UTF site. Development plans consist of one gravel mine and three basalt quarry areas. Under the proposal, areas totaling approximately 110 acres would be developed for surface mining over a 50-year period, not including connecting access roads.

The proposed sand and gravel mine is designated Gravel Mine “A”. The three quarry areas are designated Quarry Areas “A”, “B”, and “C”.

The proposed modification to the approved UTF MRD includes:

- Removal of Gravel Mine “B” from the project
- Shifting the transport of rock and aggregate from Northlake Way to Werner Road
- Moving the aggregate processing facilities off-site

Removal of Gravel Mine “B” from the project would not substantively alter the results of the noise impact assessment conducted for the original EIS. The mining area nearest to residences and with the most likelihood to cause impacts at off-site locations was Gravel Mine “A,” which was modeled extensively for the 2009 EIS. The proposed modifications to the Project would not alter this, so this revised noise impact assessment does not directly consider the noise implications of removal of Gravel Mine “B” from the project.

Shifting the truck route to Werner Road and moving the aggregate processing facilities to an off-site location are both expected to reduce potential noise impacts to residences nearest Gravel Mine "A" and adjacent to Leber Lane and Northlake Way. The shifted truck route could potentially result in new noise impacts to residences along Werner Way, though, which will be analyzed as part of this supplemental noise assessment.

AFFECTED ENVIRONMENT

Most of the affected environment information included in the 2009 EIS, including descriptions of sound, relevant noise regulations and guidelines, land uses, and existing sound levels remain relevant to this supplemental noise analysis. However, the affected environment discussion should be updated to include land uses, zoning, and existing sound levels along Werner Road, the new proposed truck access route.

Land Uses and Zoning

In addition to the nearest receivers and land uses identified in the 2009 EIS, there are varying land uses, jurisdictions, and zoning designations for the properties along the proposed new alternative access routes between the UTF site and SR-3.

From the UTF site to the Kitsap Quarry, the access route would travel on land zoned for Rural Wooded uses while on the UTF property. The access route alternatives would all travel through undeveloped R-10 Low Density Residential lands within the City of Bremerton Urban Growth Area (UGA) and a portion of City of Bremerton Utility Lands (CUL). The access route alternatives would also travel through an Urban Reserve zone in unincorporated Kitsap County. The alternative routes are primarily on undeveloped, forested lands at least 800 to 1,000 feet from any residential receivers and are not expected to result in noise impacts.

The access route segment from Kitsap Quarry to Werner Road was permitted previously and may be built in 2014. The access route connection point at Kitsap Quarry is designated as Mineral Resource under the 2012 Kitsap County Comprehensive Plan.

Along Werner Road, most parcels are typically undeveloped or used for industrial purposes or shipping/warehousing and are zoned Industrial, Industrial Park, and Freeway Corridor., These parcels are located in the City of Bremerton. A portion of Werner Road in unincorporated Kitsap County includes several residences and a church as well as a few undeveloped parcels. These parcels are primarily zoned Urban Low Residential with some Medium Residential and Industrial zoning. Although the residences and church on Werner Road are not expected to be affected by noise from on-site operations, they may be affected by noise from trucking related to the revised access route to the site.

Existing Sound Levels

The long-term sound levels identified in the 2009 EIS representing residences north of the UTF site remain relevant to this assessment. In addition to the two long-term measurements taken in 2007, an additional long-term (i.e., 24-hour) sound level measurement was taken in February 2014 to represent residences and the church adjacent to Werner Road. (See attached **Figure 2**.) As in 2007, the measurements were captured with a Type I sound level meter, calibrated in the field prior to the measurement and factory-calibrated within the previous year. The measured long-term sound levels from 2007 and 2014 are presented in **Table 1**.

Table 1. Existing Sound Levels

SLM	Date	Time	Leq	Lmax	L2	L8	L25	L90	Ldn
Measurements identified in 2009 EIS									
LT-1	8/21-8/22/07	Day	38-51	55-77	43-61	40-57	37-44	32-38	45-46
		Night	32-42	45-60	36-48	34-44	32-42	29-38	
LT-2	8/21-8/22/07	Day	49-54	64-71	56-60	53-58	50-56	37-44	54
		Night	41-52	60-70	51-58	45-56	37-54	33-41	
Measurement taken for 2014 Supplemental EIS									
LT-3	2/25-2/26/14	Day	50-59	67-88	58-67	52-63	48-59	40-49	58
		Night	46-56	69-74	53-63	45-61	40-54	37-49	

Notes:

The L_{eq} is the "energy-averaged" sound level. The L_{90} is the sound level exceeded 90% of the time and is often considered representative of the background sound level. The Lmax, L_2, L_8, and L_{25} correspond to the L_{max}, $L_{2.5}$, $L_{8.3}$, and L_{25} State noise limit levels that are defined previously in this report in the discussion of the regulatory noise limits.

"Day" is between 7 AM and 10 PM. "Night" is between 10 PM and 7 AM.

IMPACTS

For this revised noise impact assessment, ENVIRON revisited the assessment on which the conclusions in the 2009 EIS were based for receivers near Gravel Mine "A." These are the only sensitive receivers likely to be adversely affected by on-site operations. ENVIRON used the same receptor locations for the supplemental assessment as used in the previous analysis but removed the processing plant and wash plant from the estimated sound levels and revised the on-site roadway to reflect the new proposed access route. (See attached **Figure 1**.) As previously, ENVIRON considered both compliance with the noise limits and the potential for noise impacts due to increases over background levels at these receivers. As part of this assessment, ENVIRON also considered the noise implications of allowing periodic nighttime trucking events.

In addition to assessing the effects of the revised proposal on the receivers nearest Gravel Mine "A", a new assessment was conducted for the sensitive receivers near Werner Road. Because

these receivers were only expected to be affected by truck traffic traveling on Werner Road, no on-site sources were considered and no compliance assessment conducted. Vehicles traveling on public roadways are exempt from the noise limits.

Compliance at Receivers Near Gravel Mine "A"

To consider daytime operations, ENVIRON included all on-site equipment considered in the 2009 EIS minus the processing and wash plants. In addition, 27 truck trips per hour were assumed to traverse the revised on-site haul road that would head south out of the pit instead of north to Leber Lane. For nighttime trucking events, ENVIRON considered the noise implications from the use of one on-site front-end loader and 16 truck trips per hour on the on-site haul road. The results of both the daytime and nighttime modeling scenarios are presented in **Table 2**.

Table 2. Modeled Sound Levels of Gravel Mine "A" Activities (L_{eq}, dBA)

Receptor	Daytime Operation	Nighttime Trucking[(a)]	County Noise Limit[(b), (c)]	Comply?
R1	34	27	55/45	Y
R2	42	33		Y
R3	46	36		Y
R4	49	37		Y
R5	43	34		Y
R6	46	35		Y
R7	43	33		Y
R8	43	35		Y
R9	43	37		Y
R10	43	32		Y
R11	42	30		Y
R12	37	26		Y
R13	38	29		Y
R14	36	25		Y
R15	26	21		Y
R16	53	40		Y
R17	54	45		Y
R18	52	42		Y

(a) The nighttime scenario includes 16 truck trips and a loader on-site filling trucks with aggregate.
(b) The noise limits shown apply to Daytime/Nighttime hours. Daytime hours extend from 7 AM to 10 PM. Nighttime hours extend from 10 PM to 7 AM.
(c) The model-calculated sound levels are hourly L_{eq}s. Although the actual noise limits are based on the hourly L_{25}s, the on-site noise sources were assumed to operate continuously over an hour period, so the hourly L_{eq} and L_{25} would be expected to be similar. The trucking L_{eq}s would be expected to be higher than the L_{25}s and represent a conservative estimate. Therefore, the L_{eq} is an appropriate noise descriptor for assessing potential compliance with the L_{25} noise limit.

As can be seen in **Table 2**, the revised noise assessment continues to demonstrate that daytime operations would comply with the daytime noise limits. This analysis also indicates that nighttime trucking of materials would comply with the stricter nighttime noise limits at sensitive receivers nearest to Gravel Mine "A."

Impacts due to Increases over Existing Levels

The revised noise analysis also took into account potential cumulative increases in noise levels due to the revised Project. Existing ambient sound levels were identified and considered in conjunction with predicted noise generated by the proposed mining operations.

As with the original proposal, substantial increases in noise (i.e., increases greater than 10 dBA based on FHWA criteria) would occasionally occur and be perceived in surrounding areas. This, in combination with other development, could contribute a cumulative increase in ambient noise levels that could be perceived negatively, especially by existing residences accustomed to noise levels consistent with a rural environment. However, the estimated increases with the revised Proposal would be lower than those identified in the 2009 EIS.

Noise Impacts along Werner Road

For this assessment, ENVIRON used the TNM Lookup tables to estimate future sound levels at receivers near Werner Road due to projected daytime and nighttime trucks from the UTF mine. These UTF-related sound levels were then added to the measured existing sound levels to estimate overall daytime and nighttime sound levels with the revised Project.

To estimate daytime trucking sound levels, ENVIRON assumed that 27 truck trips could occur on Werner Road during any hour between 7 AM and 6 PM. The estimated sound level (hourly L_{eq}) of 27 truck trips is 56 dBA. The addition of 56 dBA to the existing measured levels of 55 to 59 dBA results in hourly cumulative sound levels ranging from 59 to 61 dBA. This could result in hourly increases ranging from 2 to 4 dBA. Neither the loudest overall level of 61 dBA nor the highest increase of 4 dBA would be classified as an impact using WSDOT noise impact criteria, which define a sound level of 66 dBA or an increase of 10 dBA or more as a traffic noise impact.

To estimate periodic nighttime trucking event sound levels, ENVIRON assumed that 16 truck trips could occur on Werner Road during any hour between 10 PM and 6 AM. The estimated sound level (hourly L_{eq}) of 16 truck trips is 54 dBA. The addition of 54 dBA to the existing measured levels of 46 to 54 dBA results in hourly cumulative sound levels ranging from 55 to 57 dBA. This could result in hourly increases ranging from 3 to 9 dBA. As with daytime trucking, neither the loudest overall level of 59 dBA nor the highest increase of 9 dBA would be classified as an impact using WSDOT noise impact criteria. Therefore, no significant noise impacts are expected due to this element of the revised Project.

Construction Noise Impacts

Shifting the trucking route from Northlake Way to Werner Road would eliminate the need for the proposed improvements to Leber Lane NW and reduce construction noise impacts at residences adjacent to the roadway.

Construction of the southern access route would at least 800 to 1,000 feet from any residences and is expected to result in minimal noise impacts.

MITIGATION

Most of the mitigation measures in the 2009 EIS would remain the same. However, the mitigation measure requiring a stockpile or berm around the processing and wash plants would no longer be applicable, since the Project revisions no longer include processing the aggregate on-site. Also, the restriction of operating hours could be revised as follows:

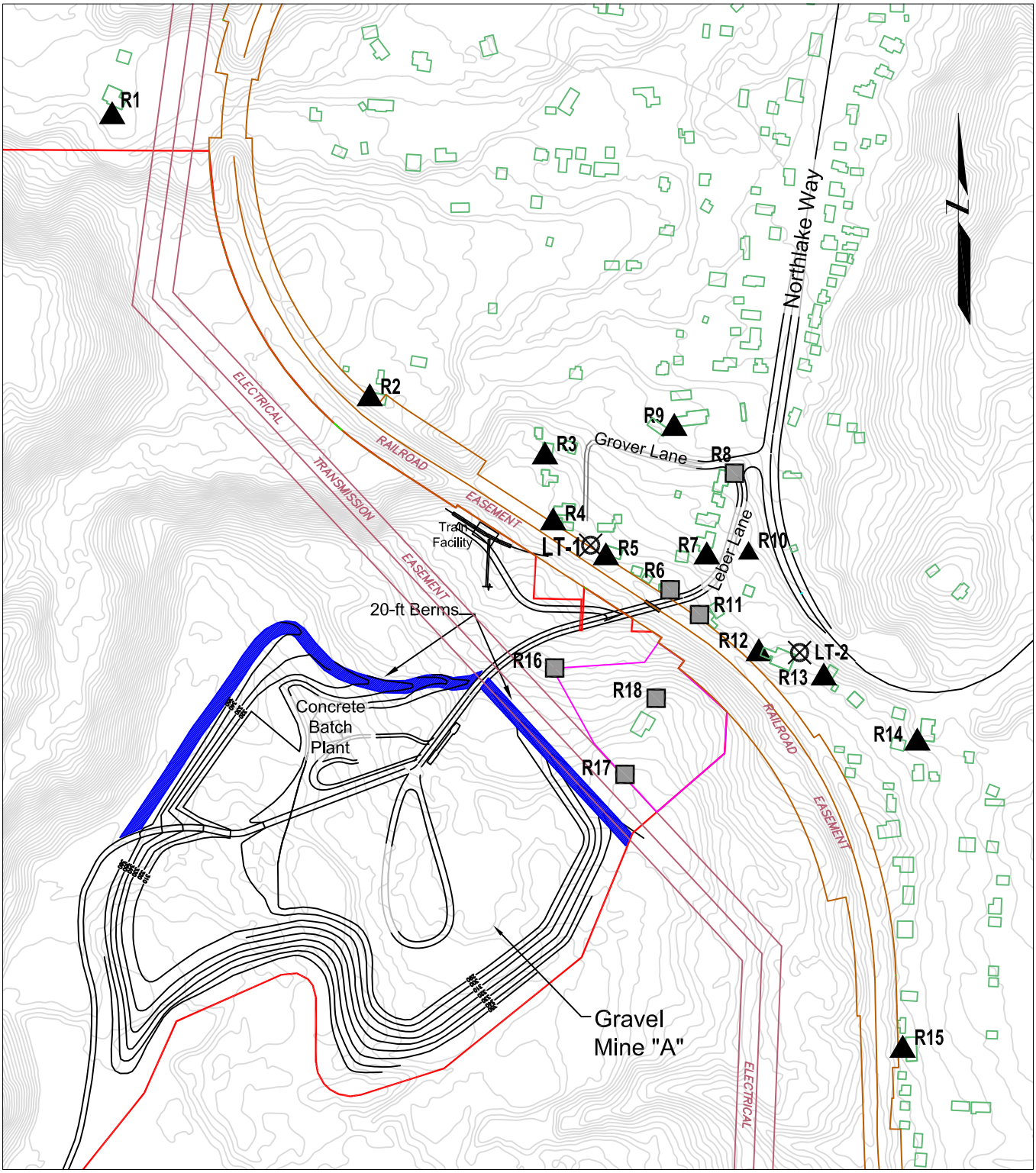
- General pit operations would occur only during daytime hours, between approximately 7:30 AM and 5:00 PM. However, periodic nighttime trucking events could occur to support special projects such as nighttime roadway construction. Nighttime trucking operations would entail the use of a front-end loader in addition to the trucks.

CONCLUSION

Removal of aggregate processing facilities and rerouting the truck access route from Leber Lane to Werner Road would reduce noise impacts to residences north of Gravel Mine “A” when compared to the analysis conducted for the 2009 EIS. Given that no significant noise impacts were identified in the 2009 EIS, no significant noise impacts would be expected due to the revised proposal.

In addition, the revision of the truck route to Werner Road would not result in significant noise impacts to sensitive receivers adjacent to Werner Road.

Finally, the inclusion of periodic nighttime trucking of aggregate materials would not introduce a significant noise impact to residences near Gravel Mine “A” or to residences adjacent to Werner Road.



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APPROXIMATE SCALE IN FEET

Legend:

- SLM Location
- Receptor Location
- Receptor on UTF Property

SLM and Receptor Locations
Ueland Tree Farm MRD
Supplemental Noise Assessment
Kitsap County, WA

By: KAR, KLW	Date: 03/19/14	Project No. 29-34453A
ENVIRON		Figure 1

Additional SLM Location
Ueland Tree Farm MRD
Supplemental Noise Assessment
Kitsap County, WA

By: KLW	Date: 04/22/14	Project No. 29-34453A
ENVIRON		Figure 2

Land Use and Visual Impact Assessment
Ueland Tree Farm
Mineral Resource Development
SUPPLEMENT

Prepared for
Ueland Tree Farm, LLC
6323 Pioneer Way East
Puyallup, WA 98371

Prepared by
Cascadia Pacific Group LLC
P. O. Box 838
Issaquah, WA 98027

March 2014

This report supplements the ***Land Use and Visual Impact Assessment*** completed for the Ueland Tree Farm, LLC (UTF) Mineral Resource Development in 2009 by Parametrix. This supplement is based on amended project and site descriptions, as discussed further in this report. Other reports specific to the Mineral Resource Development and referenced here are available at the UTF website (uelandtreefarm.com).

This supplement:

- Evaluates land use compatibility and visual resources, their potential impacts, proposed mitigation measures and best management practices (BMPs).
- Is limited to the addition of a site access option, as outlined below. This option was not addressed in the 2009 assessment.

AMENDED SITE DESCRIPTION:

The UTF site is located in Sections 12, 13, 24, and 25, Township 24N, Range 1W, and Sections 7, 18, and 19, Township 24N, Range 1E (Figure 1-1). Access will be via Werner Road in Section 20, Township 24N, Range 1E. The project area is located in the Chico and Gorst Creek watersheds with the majority of the property in the Dickerson Creek subbasin. For more detailed information on the regional setting, refer to the Ueland Tree Farm Kitsap Lake Property Sub-Basin Assessment (Parametrix 2007a).

The property is located between large tracts of open space and timber lands to the west with urban residential and industrial development (located in the Bremerton urban growth area (UGA)) along with Mineral Resource and Urban Reserve resource lands to the east. The site is bordered by land owned by the Mountaineers Foundation to the north, the Department of Natural Resources to the northwest and west, the City of Bremerton to the south, the Bremerton Watershed to the southwest, and U.S.A. (Navy) Railroad and Bremerton West Ridge, LLC to the east.

AMENDED PROJECT DESCRIPTION:

The approved Ueland Tree Farm Mineral Resource Development Project proposes development of commercial sand, gravel, and basalt mines on the UTF site. Development plans consist of one gravel mine and three basalt quarry areas (Figure 1-2). Under the proposal, areas totaling approximately 110 acres would be developed for surface mining over a 50-year period, not including connecting access roads.

The proposed sand and gravel mine is designated Gravel Mine “A”. The three quarry areas are designated Quarry Areas “A”, “B”, and “C”.

The proposed modification to the approved Ueland Tree Farm Mineral Resource Development includes:

- Removal of Gravel “B” from the project: The Mountaineers Foundation holds a conservation easement (Gravel “B”) and it can no longer be developed. UTF requests

that parcels subject to the easement, and other parcels not directly related to the project, be removed from the proposal.

- Shifting the transport of rock and aggregate from Northlake Way to Werner Road: UTF will maintain access for employees, service and maintenance vehicles by way of Northlake Way and Lebers Lane and/or Werner road. UTF requests that, if the access changes to Werner Road, the conditions in the CUP that apply to the Northlake Way access requirements be removed from the CUP.
- Moving the aggregate processing facilities off-site: UTF requests that, if the facilities are moved off-site, the conditions in the CUP that apply to the processing facilities at Gravel "A" be removed from the CUP.

The body of this supplement is organized into three functional areas consistent with the Washington State Environmental Policy Act (SEPA):

1. METHODOLOGY
2. AFFECTED ENVIRONMENT
3. POTENTIAL IMPACTS AND MITIGATION

1. METHODOLOGY

Land Use Assessment

Regulatory Setting:

The previously approved UTF Mineral Resource Development is located in unincorporated Kitsap County. Within the context of this supplement, the proposed access route is located within the incorporated jurisdiction of the City of Bremerton, as well as within unincorporated Kitsap County. Land use is regulated and influenced by the plans, policies, and regulations of Kitsap County and the City of Bremerton, as well as by state and regional plans and laws. A discussion of the planning and regulatory elements pertinent to this supplement appears in Section 2 (AFFECTED ENVIRONMENT).

Assessment Method:

Land use data and code reviews were completed to analyze potential impacts of the access route relative to the intended uses of adjacent lands. Primary data sources used in this assessment include the following:

- Kitsap County Parcel Data (2013)
- Kitsap County Aerial Photograph (Kitsap County 2001)

- Regional ortho-rectified aerial photograph (Environmental Systems Research Institute 2011)
- Kitsap County Code (Kitsap County 2013)
- Kitsap County Comprehensive Plan (Kitsap County 2012)
- Bremerton Municipal Code (City of Bremerton 2014)
- Bremerton Comprehensive Plan (City of Bremerton, adopted 2004 and updated thereafter)

Visual Assessment

Regulatory Setting:

The policies and codes of the City of Bremerton and Kitsap County do not provide specific guidance in regard to impacts on views of forested areas. However, policy vision statements provide some guidance in regard to the relative value of scenic views. For example, the following is a portion of the City of Bremerton Comprehensive Plan Land Use Vision Statement:

"Accessible waterfronts, *water and mountain views*, and urban parks add to the city's setting for everyone's enjoyment."

In addition, the State Environmental Protection Act (SEPA) provides guidance to include view impacts within the context of environmental assessment of proposed projects. For example, the SEPA project checklist includes elements to lead discussion of views and aesthetic impacts and mitigation (WAC 197-11-960).

Assessment Method:

A Viewshed Analysis of the geographic area covered by this supplement was conducted using a Geographic Information System (GIS) with Digital Elevation Model data from the United States Geological Service. The analysis identifies the geographic areas that can be seen from a single viewpoint. The viewshed modeling program assesses views based on bare ground conditions. This analysis modeled the same (ten) selected viewpoints as the Viewshed Analysis from the 2009 assessment. The products of the two analyses produced similar results.

2. AFFECTED ENVIRONMENT

Land Use Assessment

The affected environment specific to this supplement includes the access route between the UTF site and Kitsap Quarry. The access route segment from Kitsap Quarry to Werner Road was

permitted previously and may be built in 2014. The affected environment is comprised of lands that occur easterly of UTF and consist of

- Urban Reserve zoned lands, a portion of which has been designated as Mineral Resource under the 2012 Kitsap County Comprehensive Plan.
- A small inclusion of City Utility Lands (CUL zone –City of Bremerton).
- Rural Wooded zoned lands (UTF and U.S.A. - Navy Railroad).
- R-10 zoned lands within the City of Bremerton Urban Growth Area (UGA). These lands, adjacent to the UTF site, are designated as "Employment Center" under the City of Bremerton Comprehensive Plan.

See Figure 1-5 for map reference.

The sub-sections below (Land Use Plans, Zoning) provide a discussion of the planning and regulatory elements with regard to this supplement.

Land Use Plans

The following summarizes some of the pertinent comprehensive plan policies with regard to this supplement:

Kitsap County Comprehensive Plan (2012):

Mineral Resource Overlay:

- Goal 13: Discourage inappropriate land uses in the vicinity of commercial quality mineral deposits in the County through regulatory means.
  - Policy RL-53: Allow industrial uses associated with mineral resource extraction and forestry activities in the Mineral Resource overlay.
  - Policy RL-57: Prohibit residential building in the rural areas adjacent to Mineral Resource zoned lands within 100 feet from any property line unless the applicant for a building permit (1) acknowledges the possible occurrence of resource activity on the adjacent property, and (2) waives any damages which might occur to the residence or occupants because of such activities which are conducted within generally accepted management practices and in compliance with applicable laws which regulate such activities.

Urban Reserve:

- Goal 6: Identify land that is potentially suitable for inclusion in the UGA.
  - Policy RL-20: Use the Urban Reserve designation to indicate areas that may be suitable for inclusion in the Urban Growth Area (UGA). Urban Reserve lands are intended to recognize lands adjacent to designated UGAs that may be considered for potential future inclusion within an UGA in response to future needs, as reflected in revised or updated population or employment forecasts or distributions.

- Policy RL-21: Prevent the establishment of land uses or land use patterns in the Urban Reserve designation that could foreclose planning options and eventual development or redevelopment at higher urban densities.

Rural Wooded:

- Goal 18: Implement the Rural Wooded Incentive Program for clustering of limited residential development in the rural area.
  - Policy RL-68: Consider the following issues when implementing the Rural Wooded Incentive Program:
    - Preserving rural character through a mix of rural densities, innovative rural planning, and clustered development;
    - Protecting the natural environment and promoting an interconnected system of open space in the rural areas;
    - Providing appropriate buffer widths from property boundaries, existing and potential resource uses, other residential development, rights-of-way and other appropriate factors;
    - Encouraging design that preserves environmentally sensitive areas and harmonizes with topography and landscape features;

City of Bremerton Comprehensive Plan (2010):

Employment Center (EC):

- Policy direction: Provide areas for large scale employment activities that may draw workers from a large geographic area, where workers can also choose to live and shop near work.
  - Discussion: The EC designation delineates Employment Centers. Employment Centers are mixed-use environments characterized by co-location of employment activities and residential and commercial amenities for workers. Employment Centers will have significant office, light industrial and industrial activities that create large numbers of jobs, well integrated with areas providing a mix of housing types, that provide living opportunities nearby. Small to medium scale commercial uses will also be provided, allowing residents and workers easy access to services.

City Utility Lands (CUL):

- Policy direction: Maintain the primary character of this land as resource-related. All development should be limited, and demonstrate no significant environmental impact.
  - Discussion: While the primary use of this land shall continue to be used for the protection of natural resources, there will continue to be a limited amount of commercial and recreation development within the lands designated as "utility." Wherever possible, co-location should be utilized for commercial structures such as antennas. Minimal footprints shall be required. Any future development that associates with current adjacent recreational uses (such as the Gold Mountain

Golf Course or Jarsted Park) should be limited to that portion of the designation south of Old Belfair Highway and adjacent to existing similar development. Moreover, any development within this fairly pristine environment shall conform to shoreline and critical lands ordinances and be designed in an environmentally sensitive way. All developments should go through rigorous environmental review. Where development can be allowed should conform to the recommendations made by other regional watershed planning efforts such as the Chico Watershed Alternative Futures Project.

Zoning

The following outlines pertinent elements of the applicable zoning codes with respect to this supplement:

- Urban Reserve – Kitsap County:

The Urban Reserve zone is intended to be located along the boundaries of existing urban growth areas (UGAs). The zone is intended to allow continued rural development while discouraging land use patterns that could foreclose options for inclusion into future UGAs and their higher densities and land use intensities. This zone may also apply to properties which are being considered for non-residential use. This zone allows a density of 1 dwelling unit per 10 acres.

- Rural Wooded – Kitsap County:

The Rural Wooded zone is intended to encourage the preservation of forest uses, retain an area's rural character and conserve the natural resources while providing for some rural residential use. This zone is further intended to discourage activities and facilities that can be considered detrimental to the maintenance of timber production.

- Residential (R-10) – City of Bremerton:

The goal of the residential (R-10) zone is to accommodate single-family housing by infilling at a range of lot sizes consistent with urban growth patterns (up to 10 dwelling units per acre). Some attached single-family housing may be appropriate when responding to sensitive areas or with innovative design. Residential development at higher densities is encouraged at the edge of designated centers.

- City Utility Lands – City of Bremerton:

The goal of the Bremerton City Utility Lands (CUL) zone is to preserve resource-related functions of land, and to protect watersheds and timberlands. The CUL zone is also intended to ensure healthy forest cover and provide habitat for wildlife. The zone will accommodate some limited commercial and recreational activities, which adhere to a high standard of environmental best management practices, and low impact development.

Suitability:

This supplement is specific to the addition of an access route for the UTF mineral development proposal. Access roads are not explicitly prohibited in any of the zoning districts outlined here. The addition of the proposed access route is consistent with the land use intent of these zones and may be permitted under a revised CUP.

Visual Assessment

The affected environment, for the purposes of this supplement, includes those lands on which the access route will be located between the existing roads on the UTF site and the existing (previously permitted) road at Kitsap Quarry which will access Werner Road. This area includes the valley floor near Kitsap Creek, as well as the adjacent hill slopes between Kitsap Quarry and the UTF site.

Of the ten viewpoint locations analyzed in the 2009 assessment, two of the viewpoints pose additional potential impacts relative to the proposed access route. The subject viewpoints and their viewsheds, Kitsap Lake Downhill and East Bremerton, are shown in detail in Figures 1-3 and 1-4. The potential impacts are addressed below.

3. POTENTIAL IMPACTS AND MITIGATION

Land Use Assessment

The proposed access route occurs within or adjacent to three resource-oriented zoning designations:

- Urban Reserve Zone (a portion of which is designated as Mineral Resource Overlay in the Kitsap County Comprehensive Plan).
- Rural Wooded Zone.
- City Utility Lands Zone.

These designations are consistent with providing access for resource related activities. Potential impacts of daily operation in these zones include dust, odor, and truck traffic. Mitigation measures and BMPs outlined in the 2009 assessment are intended to ensure compatibility with uses proposed in this supplement and within these zoning districts.

The access route also occurs within an area of R-10 zoning in the City of Bremerton UGA. However, the access route uses existing roadway within this zone. The R-10 zone allows for the densest residential development of all the areas adjacent to the access route. The R-10 zone allows for up to ten dwelling units per acre, with a possibility of an urban mixed use development. Potential impacts of daily operation in this zone include dust, odor, and truck

traffic. Mitigation measures and BMPs outlined in the 2009 assessment are intended to ensure compatibility with the uses proposed in this supplement and within this zone.

Access route construction will most likely precede urban development in this zone. This *de facto* sequencing will reduce land use impacts by minimizing the possibility of developing the access route within an already-urbanized environment.

Visual Assessment

The UTF property and the access route are situated along the eastern slopes of Green and Gold Mountains. The property faces the major population centers and transportation corridors of the greater Bremerton area and Kitsap County. However, the access route proposed in this supplement is potentially visible from just two of the ten viewpoints analyzed in the 2009 assessment.

Within the scope of this supplement, there is potential for impacts to middle ground and background views, as seen from the Kitsap Lake Downhill Viewpoint (Figure 1-3) and the East Bremerton Viewpoint (Figure 1-4). The proposed access route will likely appear as a thin linear feature across the rural forested landscape. More specifically, the access route may resemble a thin linear opening in the forest canopy when seen as an element in foreground and middle ground views. It's important to note that the *current* views from these viewpoints contain similar linear features. The origins of these visual features are created by existing roads and power line/railroad corridors in the vicinity. While the access route may be visible as an additional linear feature on the forested landscape, impacts will be minimized as seen within the visual context of existing landscape features.

The *physical* features of the access route (roadway prism, embankments) will be subject to the visual screening effects afforded by the forested landscape adjacent to the access route. Similarly, truck traffic will be subject to these same visual screening effects.

Mitigation measures and BMPs outlined in the 2009 assessment are intended to reduce the view impacts to surrounding properties, as analyzed in this supplement.

REFERENCES

Parametrix 2009. Land Use and Visual Impact Assessment, Ueland Tree Farm – Mineral Resource Development. Prepared by Parametrix, Bremerton, Washington. February.

Parametrix. 2007. Ueland Tree Farm Kitsap Lake Property Draft Sub-Basin Assessment. Prepared by Parametrix, Bremerton, Washington. March.

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Parametrix. 2007. Wetland Delineation and Stream Identification Report. Ueland Tree Farm - Kitsap Lake Property. Kitsap County, Washington. Prepared by Parametrix, Bremerton, Washington. June.

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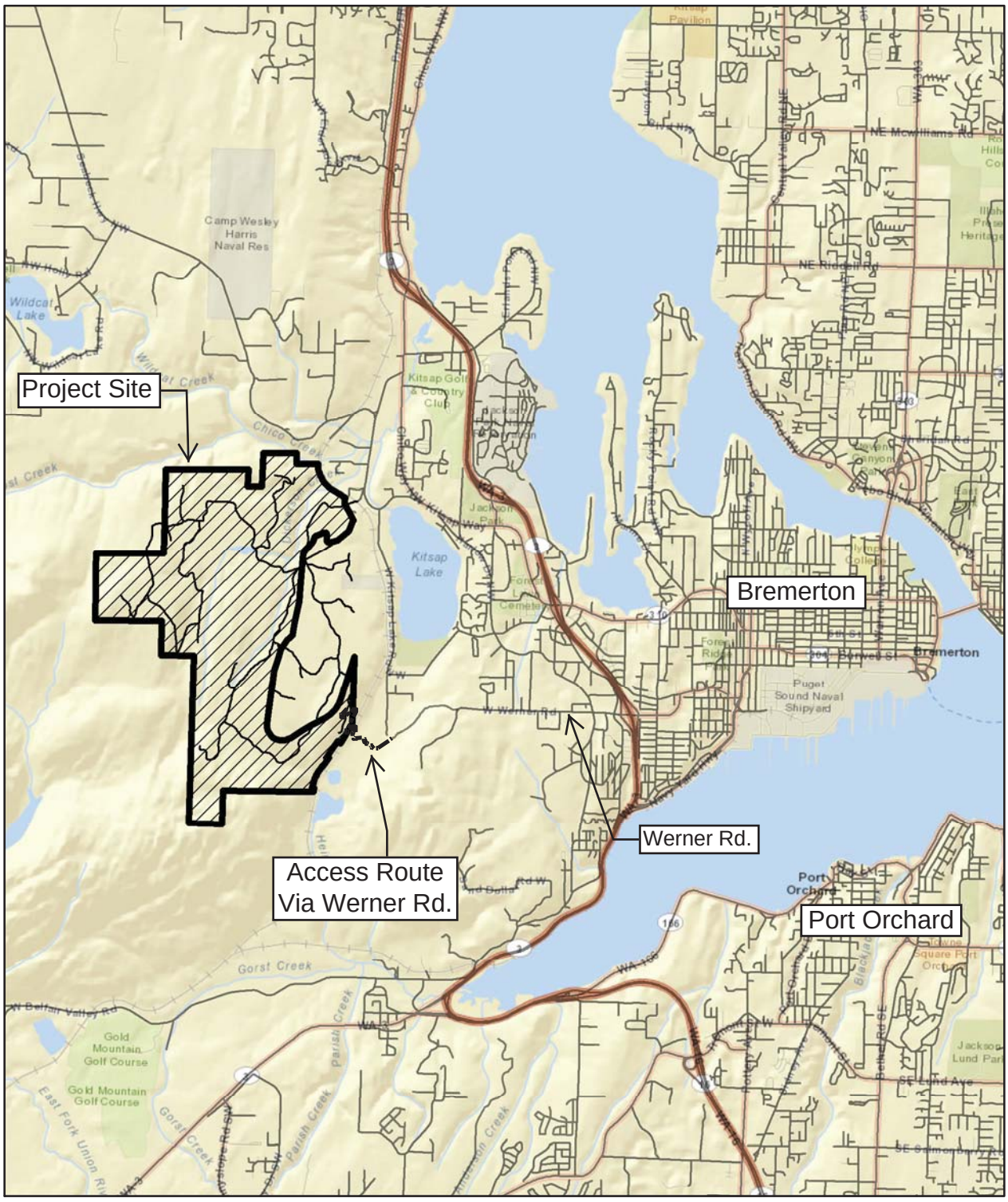

FIGURE 1-1
Project Vicinity

0 3,000 6,000 Feet

N

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Legend

- New Access Rd.
- UTF Site
- Existing Roads

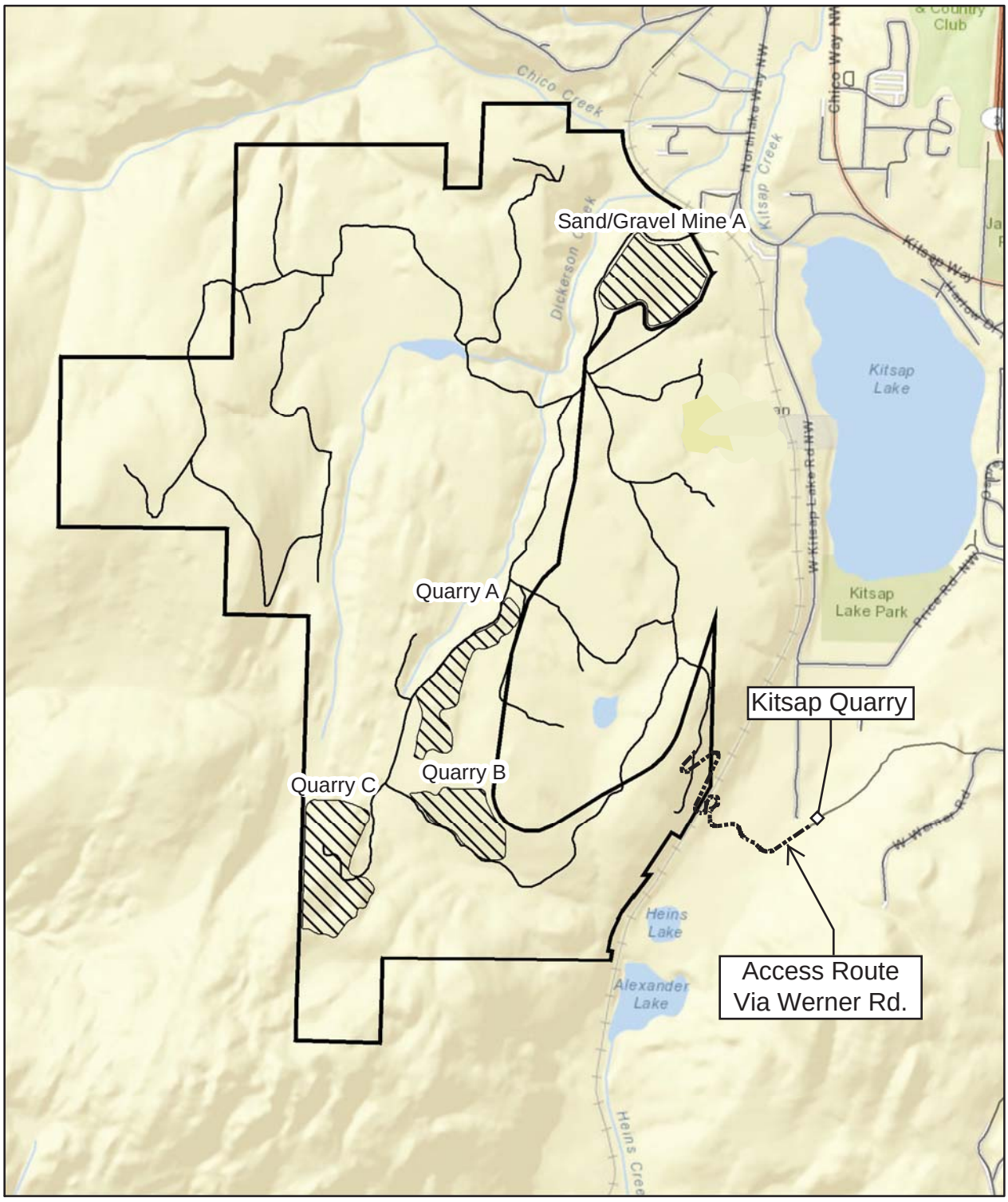

FIGURE 1-2
Site Plan

0 1,200 2,400 Feet

N

Legend
- New Access Rd.
- UTF Site
- Mineral Areas
- Existing Roads

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FIGURE 1-3
Kitsap Lake Downhill
Viewpoint
Viewshed Analysis

Seabeck Hwy.

Sand/Gravel Mine A

SR 3

PSE R/W

Quarry A

Quarry B

Quarry C

RR

Railroad (Navy)

Access Route

East Bremerton

Bremerton

Port Orchard

Legend

- Kitsap Lake Downhill A-2S
- New Access Rd.
- UTF Site
- Mineral Areas
- Existing Roads
- Not Visible
- Visible

N

0 1,850 3,700 7,400 Feet

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FIGURE 1-4
East Bremerton
Viewpoint
Viewshed Analysis

Seabeck Hwy.

SR 3

East Bremerton

Sand/Gravel Mine A

PSE R/W

Bremerton

Quarry A

Quarry B

Quarry C

Railroad (Navy)

Access Route

Port Orchard

Legend

- East Bremerton A-9S
- New Access Rd.
- UTF Site
- Not Visible
- Visible
- Mineral Areas
- Existing Roads

N

0 1,850 3,700 7,400 Feet

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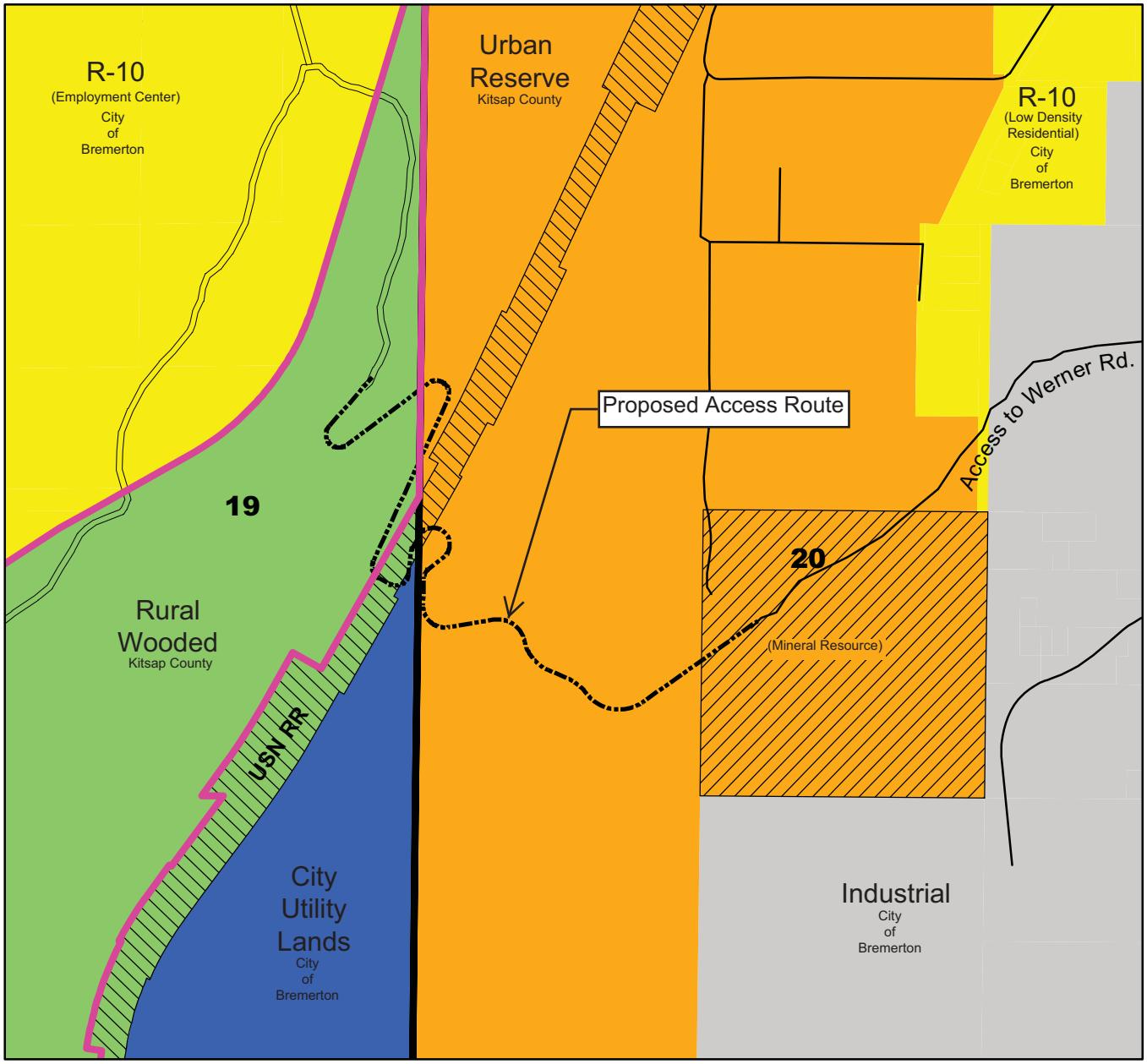


Figure 1-5
Ueland Tree Farm
Zoning and Land Use
Proposed Access Road Construction Vicinity

Land use designations, per City of Bremerton and Kitsap County Comprehensive Plans, are noted in parentheses if different than zoning designations.

Legend

- UTF Site
- USNRR
- New Access Rd.
- Existing Roads
- Section Lines
- Mineral Resource - KC Comp Plan
- R10 zone - City of Bremerton
- UR zone Vicinity
- CUL zone - City of Bremerton
- Industrial zone - City of Bremerton
- RW zone Vicinity
- Existing Roads

0 390 780 Feet

1 inch = 750 feet

N

Cascadia Pacific Group
cascadiapacificgroup.com

JTE . Jake Traffic Engineering, Inc. .

Mark J. Jacobs, PE (WA and OR), PTOE
President
2614 39th Ave. SW Seattle, WA 98116-2503
Tel. 206.762.1978 - Cell 206.799.5692
E-mail jaketraffic@comcast.net

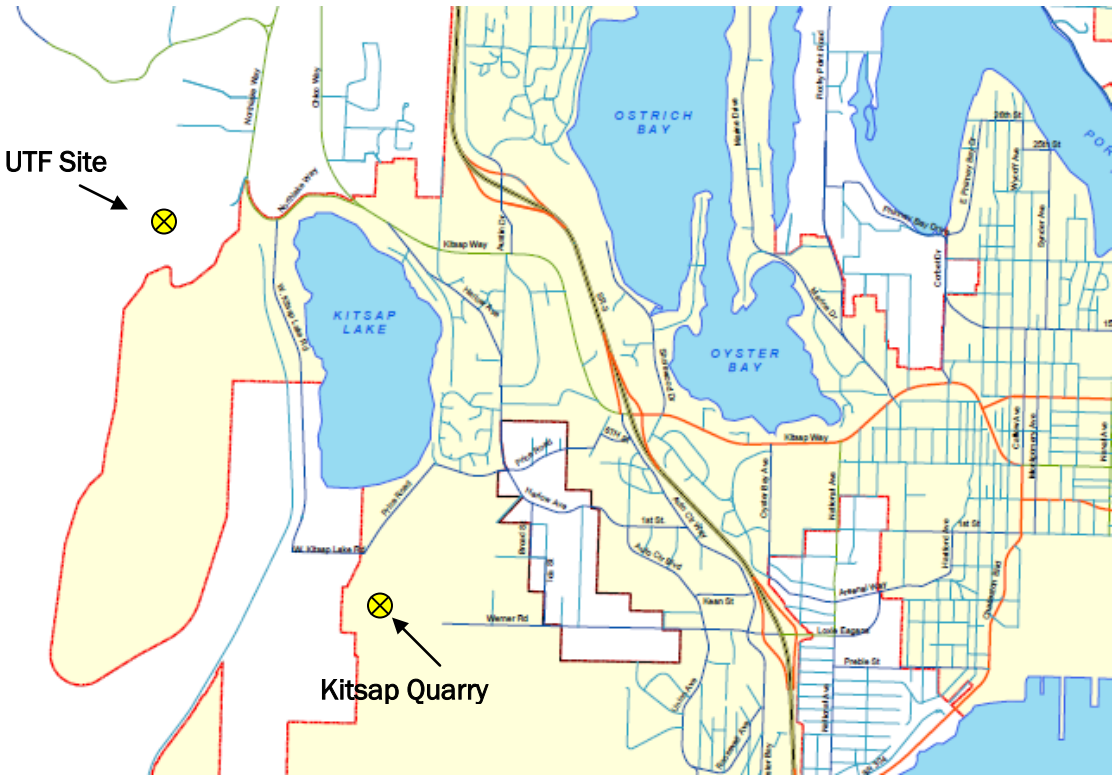
June 30, 2014

Mark Mauren, Chief Operating Officer
UELAND TREE FARM
c/o Brett Allen, PE
CONTOUR ENGINEERING, PLLC
3309 56th Street NW Suite 106
Gig Harbor, WA 98335

Re: Ueland Tree Farm– Bremerton
Proposed West Werner Road Connection Technical Memorandum

Dear Mr. Mauren,

I am pleased to present this Technical Memorandum for the Ueland Tree Farm (UTF) West Werner Road connection. The proposal would shift aggregate truck traffic (service and logging traffic would not change) from the approved Leber Lane NW/Northlake Way NW to West Werner Road; see map below:



BACKGROUND

A detailed Traffic Study was prepared for the proposed gravel mine and bedrock quarry in 2007. The report is titled Traffic Study – Ueland Tree Farm Mineral Resource Development December 2007 prepared by Parametrix, pertinent pages attached. This report identified the project would generate on average 186 daily trips with 136 noted as truck trips, 32 employee trips and 18 other trips (vendors, service/delivery and guests) type trips. Access to the facility was proposed via Leber Lane Northwest. The County approved the Ueland Tree Farm Mineral Resource Development CUP in April 2011.

The proposed UTF Mineral Resource Development project shifts aggregate truck traffic from Leber Lane NW/Northlake Way NW to West Werner Road. This shift in the aggregate truck traffic provides a more direct routing to the State Highway system and lessen the affect to residential Areas. West Werner Road is classified as a Collector Road and Northlake Way NW a Minor Arterial, both streets have classifications that support truck traffic.

Kitsap Quarry has an approved access street between the quarry and West Werner Road. The UTF Mineral Resource Development project proposes to tie into this approved private street connection, see map on page 1.

I prepared the Kitsap Quarry Access Revision Traffic Letter dated December 14, 2012, pertinent pages attached. This report analyzed the effect of shifting the **existing** Kitsap Quarry site traffic from the west side of the site via Archie Ave. W. to the west via West Werner Road. West Werner Road, a Collector Road, provides a significantly shorter route to the State Highway system, thus the overall effect of re-locating the site access is **a substantial reduction in vehicle miles of travel** on the County Road/City Street system.

In preparing Kitsap Quarry Access Revision Traffic Letter I referenced Lakeside Industries Asphalt Plant Traffic Impact Analysis dated December 21, 2012 by Parametrix, pertinent pages attached. This TIA was prepared for an Asphalt Plant located off of West Werner Road about ¼ mile east of the proposed re-located access to serve the existing Kitsap Quarry. An asphalt plant is an industrial use that generates truck traffic similar to quarrying activities. This report builds upon the recent traffic studies conducted for West Werner Road by me and Parametrix.

I have reviewed the Lakeside Industries Asphalt Plant Traffic Impact Analysis, in particular traffic generation, traffic operations, truck effects (Equivalent Single Axel Load (ESAL)), traffic safety and mitigation.

The following are my discussion and conclusions based on the material/documents I have reviewed and my extensive Professional Traffic Engineering Experience.

TRIP GENERATION

The Lakeside Industries Asphalt Plant is projected to generate 56 daily, 12 AM and 12 PM peak hour trips, respectively. From the data in the report I interpret 40 trucks trips a day with

12 occurring during the AM and 4 during the PM peak hour. There is noted to be seasonal variation in the traffic. The other 16 trips are automobile trips made by employees and visitors to the plant.

The UTF Mineral Resource Development is an approved project projected to generate 186 daily trips (136 truck trips) with 35 noted during the PM peak hour (that I believe to be high and is more likely to be around 20 based on the PM peak hour comprising about 10% of the daily traffic) with access via Leber Lane Northwest. Kitsap Quarry has access to West Werner Road that is a more direct route to the State Highway system. The UTF Mineral Resource Development proposal is to re-route the aggregate truck traffic from Leber Lane NW/Northlake Way NW to West Werner Road via the Kitsap Quarry facility.

The Kitsap Quarry Access Revision Access Relocation Traffic Letter dated 12.14.2012 prepared by JTE, Inc. identified that the Kitsap Quarry site generates about 40 trips per day with 30 of them being trucks. Four of the trips would occur during the PM peak hour.

UTF Mineral Resource Development and Kitsap Quarry operations combined are expected to generate **about 226 daily trips in an average month. Of the 226 daily trips approximately 166 would be truck trips**.

During the peak construction season up to 70,000 tons could be shipped (June through September). The work days would be Monday through Saturday with exceptions being special projects which would generate trips outside of the peak traffic flows, typically during the dry season. For example, night road construction projects that need material delivered at night that lessens the traffic impact to the travelling public by avoiding day time street/road closures. These would be an exception and not the norm. Other times of the year less shipments would occur.

The existing 2012 background average eastbound daily traffic on West Werner Road west of Union Avenue W. is 1,392 trips, obtained from Lakeside Industries Asphalt Plant Traffic Impact Analysis. The total bi-directional daily traffic volume is 2,780. A typical 2-lane arterial street has a daily capacity of 15,000 vehicles per day. The 226 daily trips by the UTF Mineral Resource Development and Kitsap Quarry represent about 8% of the existing traffic and less than 2% of the capacity of the arterial street.

The approved UTF Mineral Resource Development and the existing Kitsap Quarry combined generate 226 daily trips on average as compared to the 56 noted in the in the Lakeside Industries facility traffic report. Of particular note: The UTF Mineral Resource Development project is approved and the Kitsap Quarry traffic already exists , the traffic simply is re-routed to West Werner Road that provides a more direct access to the State Highway system; and results in a substantial reduction in vehicle miles of travel on County roads and City streets!

TRAFFIC OPERATIONS

Provided the following:

1. The Lakeside Industries Asphalt Plant Traffic Impact Analysis projected traffic out to 2032.
2. Kitsap Quarry traffic is re-routed to West Werner Road.
3. The combined PM peak hour trips by the approved UTF Mineral Resource Development and the existing Kitsap Quarry are noted to add 39 PM peak hour trips (35 by UTF + 4 by Kitsap Quarry). It is likely less than 39 PM peak hour trips would be added because the UTF Mineral Resource PM peak hour traffic estimate (Parametrix 2007) is higher than typical data would suggest.
4. The UTF Mineral Resource Development/Kitsap Quarry traffic is less than the 50 PM peak hour traffic impact threshold used by the County to require traffic study[1]. The effect to traffic operations by Lakeside Industry is noted to be minimal; and by Traffic Engineering inspection the re-route of the UTF Mineral Resource Development/Kitsap Quarry traffic would have minimal effect to traffic operations;
5. Finally, the approved UTF Mineral Resource Development and existing Kitsap Quarry traffic has been and already is a part of the traffic in the area.

The re-route simply provides a more direct route to the highway system and lessens the traffic effect to the area street/road system.

TRUCK EFFECT/ESAL

The re-routing of the approved UTF Mineral Resource aggregate trucks and the existing Kitsap Quarry traffic would add truck traffic to West Werner Road, a classified Collector Street. This street per the Lakeside Industries Asphalt Plant Traffic Impact Analysis already serves a high percentage of trucks noted at 36 percent. With the re-routed traffic the truck percent would increase from 37 to 39% in the 2032 LTR build scenario. The calculation is included in the appendix.

The Equivalent Single Axle Load (ESAL) of the added truck traffic was estimated using the WSDOT online calculator, http://www.pavementinteractive.org/wsdot-esal-application/.

I conducted analysis with and without the added UTF/Kitsap Quarry site traffic using West Werner Road. Using a background traffic growth rate of 0.2%/year and the 2032 601 single unit trucks and 109 double unit trucks noted in Lakeside Industries Asphalt Plant Traffic Impact Analysis the resultant 2032 cumulative ESAL is calculated at 2,226,399. With the 83 added EB trucks due to the UTF/Kitsap Quarry re-route the cumulative ESAL would be 2,908,285; an increase of 642,729 ESAL's.

[1] Reference Section 2.2 page 2-2 Traffic Study – Ueland Tree Farm Mineral Resource Development

TRAFFIC SAFETY

The re-routed traffic to West Werner Road comprises truck and automobile traffic consistent to existing traffic composition using the arterial street. I concur with the Lakeside Industries Asphalt Plant Traffic Impact Analysis safety analysis and recommendation. Relocating the Kitsap Quarry traffic to West Werner Road does not alter any existing street geometric or channelization and thus would have a negligible affect. The site access on West Werner Road would need to be constructed to appropriate standards.

TRAFFIC MITIGATION

The Lakeside Industries Asphalt Plant Traffic Impact Analysis notes that all of the study intersections operate at City requirements with one exception. The exception is the stop controlled SB to WB left turn movement at the SR – 3 SB/W. Loxie Eagans Boulevard intersection The analysis notes the stop controlled left turn movement currently has substantial delays and are expected to increase in the future regardless. The Lakeside Industries Asphalt Plant Traffic Impact Analysis explored the feasibility of signalizing the intersection with WSDOT.

The Lakeside Industries Asphalt Plant Traffic Impact Analysis identifies a one time 0.4% contribution to improve traffic operations/safety at the SR – 3 SB/W. Loxie Eagans Boulevard intersection. The Kitsap Quarry re-routed traffic is about 4 (226 ADT/56 ADT) times that of the Lakeside Industries traffic; thus a 1.6% contribution is suggested based on proportionate share methodology that is typical.

I understand that the Kitsap Quarry re-route project has a Traffic Mitigation agreement with the City. The re-route of the approved UTF Mineral Resource Development aggregate truck traffic and the Kitsap Quarry is projected to result in approximately 136 truck trips on an average day to W. Werner Road. I understand that the prior accord was based on 30 trucks per day; thus simply pro-rating the prior settlement accordingly, aka via a factor of 4.5 (136/30), is suggested.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This Technical Memorandum for the re-routing of the approved UTF Mineral Resource Development traffic is based on prior traffic research/study conducted. The following reports were reviewed and are referenced:

- Traffic Study – Ueland Tree Farm Mineral Resource Development
- Kitsap Quarry Access Revision Access Traffic Letter
- Lakeside Industries Asphalt Plant Traffic Impact Analysis
- Kitsap Quarry Access Revision Access Relocation Traffic Letter

Using information contained in the above Traffic Documents, I ascertained that the re-routing of the approved UTF Mineral Resource Development aggregate truck traffic and the existing Kitsap Quarry traffic would have minimal affect to traffic operations on West Werner Road, is

less than the 50 PM peak hour trip threshold specified by Kitsap County to require a traffic study and the re-routed traffic would be less than 2% of the daily capacity of the affected arterial street. Based on my analysis I would recommend that the UTF project be allowed to re-route access to West Werner Road with the following recommendations:

1. Operate the gravel and quarry sites in accordance with applicable County and City requirements.
2. Construct the re-located site access in accordance with applicable standards.
3. Coordinate appropriate Traffic Mitigation with the City based on prior accord.

Please contact me at 206.762.1978 or email us at jaketraffic@comcast.net if you have any questions.

Sincerely,

Mark J. Jacobs, PE, PTOE, President
JAKE TRAFFIC ENGINEERING, INC

MJJ: mjj