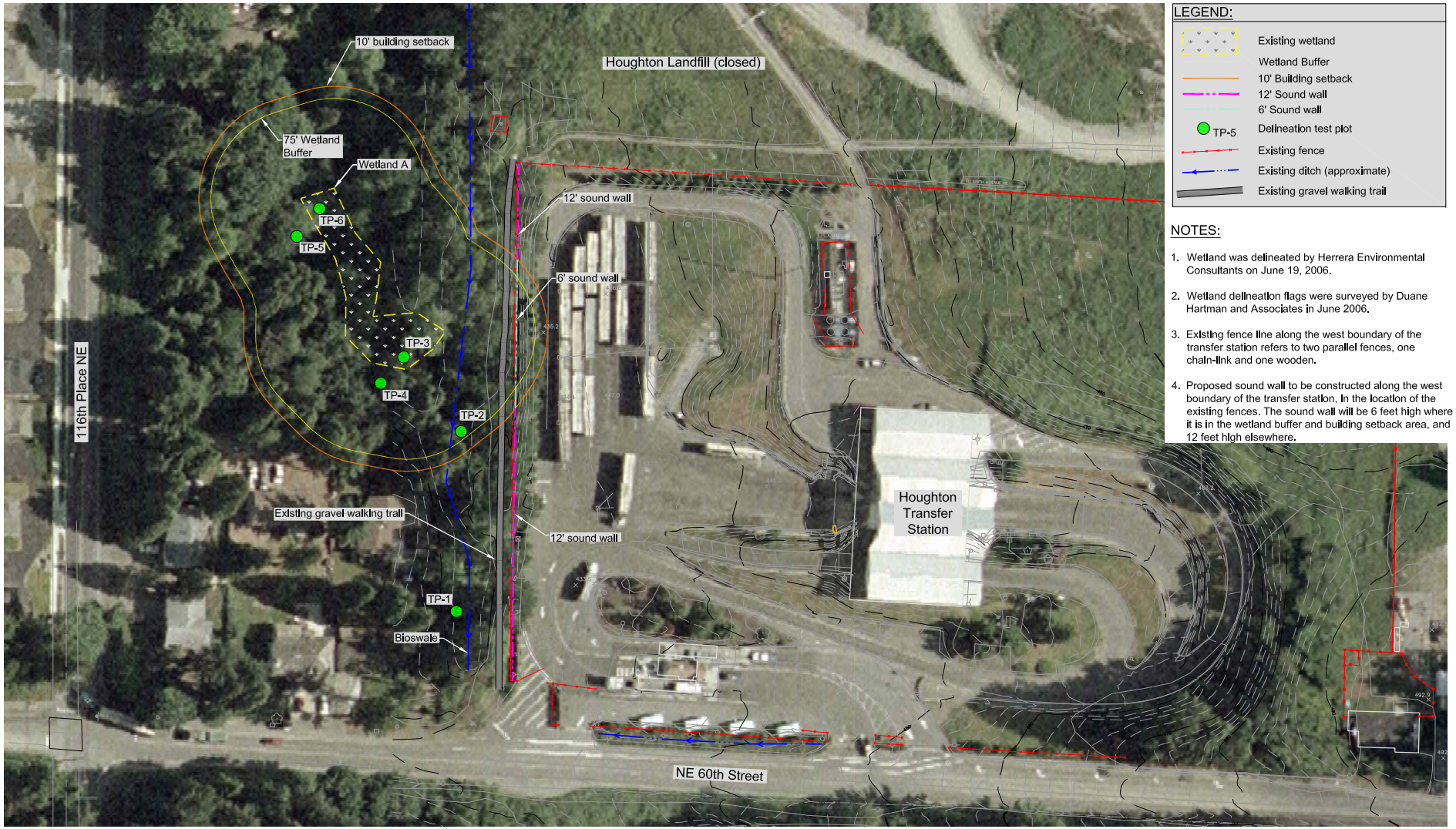


Paths: O:\proj\05-03147-200\CAD\Dwgs\Figure 2.dwg
Plot Date: 9/25/2007 10:24 AM Cad User: Todd Prescott
Plot Style Table: Herrera-24bw.ctb Plotter: Adobe PDF

Figure 2. Wetland and buffer boundaries in the study area of the Houghton Transfer Station Mitigation Project, Kirkland, Washington.

- Classify wetlands in the study area using the hydrogeomorphic classification system (Brinson 1993)
- Rate wetlands in the study area using the Washington State Department of Ecology (Ecology) wetland rating system (Hruby 2004)
- Discuss wetland categories and buffer widths specified in the City of Kirkland Zoning Code (Kirkland 2005a)
- Discuss applicable regulations and guidance provided by local and federal agencies
- Discuss project impacts and mitigation, if applicable.

Methods and Materials

Review of Available Information

A literature review was performed to identify potential wetlands and streams in and near the study area. Information collected specifically for this wetland assessment included the following:

- Topographic map of the project vicinity (USGS 1973)
- National Wetlands Inventory map of wetland areas in the project vicinity (USFWS 1988)
- Soil Conservation Service soil survey maps and soil descriptions for the project vicinity (SCS 1973)
- Hydric soils list compiled by the National Technical Committee for Hydric Soils (SCS 1991)
- King County sensitive areas map (King County 1990)
- *Kirkland's Streams, Wetlands, and Wildlife Study* (Watershed Company 1998)
- Kirkland sensitive areas map (Kirkland 2005b).

Wetland Delineation

The wetland delineation for the Houghton Transfer Station Mitigation Project was performed in accordance with the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997), which is consistent with the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The three-parameter approach used to identify and delineate wetlands relies on the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology. These three parameters are defined and described in the subsections below. This wetland delineation was performed according to procedures specified under the routine wetland determination method (Ecology 1997).

To identify potential wetlands, wetland biologists evaluated field conditions by walking the entire study area. For each area that appeared to exhibit wetland characteristics, data on dominant plant species, soil conditions in test pits, and evidence of hydrologic conditions were recorded on routine wetland data forms. Adjacent upland areas were also analyzed. On the basis

of the collected data, a wetland/nonwetland determination was made for each area examined. Observations of wildlife species and signs of their presence were also noted during the field visit.

Potential wetland areas within the study area were identified as distinct vegetation units, for which the three parameters (hydrophytic vegetation, hydric soils, and hydrology) were evaluated. A vegetation unit is an area that is determined to have relatively uniform plant communities or physical characteristics. Features such as species uniformity, species dominance, distinct topographic breaks, and obvious similarities in soil or hydrologic indicators are factors that define a vegetation unit.

After the confirmation of all three wetland parameters, wetland boundaries were delineated by placing orange fluorescent flagging along the wetland perimeter. Wetland boundaries were surveyed by Duane Hartman and Associates, Inc.

Hydrophytic Vegetation

Hydrophytic vegetation is characterized by the ability to grow, effectively compete, reproduce, and persist in anaerobic soil conditions that have resulted from periodic or long-term saturation. Numerous field indicators of hydrophytic vegetation may be used, although the most common indicator is defined as more than 50 percent of the dominant species in each vegetation stratum having a wetland indicator status of obligate wetland (OBL), facultative wetland (FACW), or facultative (FAC). The plant indicator status categories are explained in Table 1.

Table 1. Plant indicator status categories.

Indicator Status	Indicator Symbol	Definition
Obligate wetland plants	OBL	Plants that occur almost always (estimated probability >99%) in wetlands under natural conditions but also occur rarely (estimated probability <1%) in nonwetlands
Facultative wetland plants	FACW	Plants that usually occur (estimated probability >67%) in wetlands under natural conditions but also occur (estimated probability 1% to 33%) in nonwetlands
Facultative plants	FAC	Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and nonwetlands
Facultative upland plants	FACU	Plants that sometimes occur (estimated probability 1% to 33%) in wetlands but occur more often (estimated probability >67% to 99%) in nonwetlands
Obligate upland plants	UPL	Plants that rarely occur (estimated probability <1%) in wetlands under natural conditions
Wet ——— *Dry* *OBL* → *FACW* → *FAC* → *FACU* → *UPL*		

Source: Environmental Laboratory (1987).

Dominant species are those that contribute more than other species to the character of a plant community. To determine dominance, plant species are divided into three strata: trees, shrubs, and herbaceous species. For each stratum, dominance is measured by one of three factors (height, areal coverage, or basal area). For this evaluation, dominance was measured by the percentage of areal coverage by each species within a stratum.

To determine dominance within a particular stratum, the plant species within the stratum are listed in decreasing order of their areal coverage. Starting with the plant species at the top of the list (the highest percentage of coverage) and proceeding down the list (in descending order of coverage), the percentages are cumulatively totaled until the sum reaches 50 percent. The plant species that constitute this first 50 percent of areal coverage are considered the dominant species in the stratum. In addition, a plant species that constitutes 20 percent or more of the areal coverage in the stratum is also considered a dominant species (Environmental Laboratory 1987).

Plant species were identified using *A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon* (Cooke 1997). The indicator status of each plant species is based on the Pacific Northwest list of plant species that occur in wetlands (USFWS 1993).

Other evidence of hydrophytic vegetation includes observation of plant species growing in areas of prolonged inundation or soil saturation and visual evidence of physiological, morphological, or reproductive adaptations.

Hydric Soils

A hydric soil is a soil that is saturated, flooded, or inundated long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (SCS 1988). Hydric soils data were obtained by digging test pits at least 16 inches deep and 4 inches wide.

The most common field indicator of hydric nonsandy soils is soil color (i.e., hue, value, and chroma), which is evaluated using *Munsell Soil Color Charts* (Munsell Color 2000). Hydric soil colors are examined immediately below the A-horizon or at a depth of 10 inches, whichever is shallower. Hydric soils include gley soils, low-chroma (≤1) soils in an unmottled matrix, and soils with mottles within a low-chroma (≤2) matrix. Mottles are features that resemble spots of contrasting color, which may be the result of oxidation and reduction processes.

Other hydric indicators for nonsandy soils include the presence of organic soils (i.e., histosols or histic epipedons), sulfidic material (i.e., hydrogen sulfide), aquic or peraquic moisture regimes, reducing soil conditions, and the presence of iron or manganese concretions.

Soil color is not a reliable hydric indicator for sandy soils. Hydric soil indicators for sandy soils include a high content of organic matter in the surface horizon, streaking of subsurface horizons by organic matter, and organic pans (i.e., spodic horizons).

Hydric soils are further confirmed by verifying their listing on the hydric soils list (SCS 1991).

Wetland Hydrology

Wetland hydrology is indicated by soils that are periodically inundated or saturated to the surface for a sufficient duration during the growing season. A sufficient duration is defined as at least 12.5 percent of the total growing season days that are consecutively inundated or saturated to the surface. The growing season is the period of consecutive frost-free days, or the longest period during which the soil temperature stays above biological zero (41°F) at 19.7 inches below the surface. As a general rule, the growing season for western Washington lowlands consists of 245 days, extending from March 1 to October 31 (Ecology 1997). Therefore, a sufficient duration of inundation would be a minimum of 31 days.

In the field, the primary hydrologic indicators are examined within the soil test pits that are dug to observe the hydric soil conditions. Hydrologic indicators include the presence of standing water in the pit at a depth of 12 inches or less from the surface and saturation in the root zone. Secondary field indicators are watermarks, drift lines, sediment deposits, drainage patterns within wetlands, oxidized rhizospheres surrounding living roots, and water-stained leaves, along with field verification of local soil survey data.

Existing data indicating the presence of wetland hydrology also can be found in records obtained from district offices of the U.S. Army Corps of Engineers; the National Wetlands Inventory; the U.S. Geological Survey; small watershed projects of the U.S. Department of Agriculture, Natural Resources Conservation Service; planning documents of developers; and records of state, county, and local agencies. Where applicable, types of recorded data include stream gauge data, lake gauge data, tidal gauge data, flood predictions, and other pertinent historical data.

Wetland Classification and Rating

Wetlands observed in the study area were classified according to the U.S. Fish and Wildlife Service classification system (Cowardin et al. 1979). This system is based on an evaluation of ecological attributes such as vegetation class, hydrologic regime, salinity, and substrate.

Wetlands were rated using the City of Kirkland wetland rating system, which consists of Types 1, 2, and 3 wetlands (Kirkland 2005a). In this rating system, Type 1 wetlands are the highest quality or highest functioning wetlands, and meet one or more of the criteria listed in the Code. Type 2 wetlands do not meet any of the criteria for Type 1 wetlands, and merit at least 22 points on the City of Kirkland Wetland Field Data Form (Kirkland 2005a, Chapter 180, Plate 26). Type 3 wetlands are the lowest quality wetlands, meriting fewer than 22 points on the City of Kirkland Wetland Field Data Form.

Results

This section presents the results of the wetland assessment performed for the Houghton Transfer Station Mitigation Project. The following discussion includes an analysis of available information that was reviewed for the project, in addition to an analysis of site conditions that was based on field investigations in the study area.

Analysis of Available Information

Information gathered from published literature sources, maps, and agency reports was reviewed to assess the historical and current presence of wetlands in the study area.

Existing Conditions

The Houghton Transfer Station is a 7.78-acre site located on NE 60th Street, approximately 350 feet east of the intersection with NE 116th Avenue (Figure 2). Directly north of the transfer station is the Houghton Landfill (now closed and remediated). A 13-foot-wide gravel walking trail is located along the west side of the transfer station, extending north from NE 60th Street to beyond the former landfill. This trail is located within a City of Kirkland right-of-way and is used by King County to access the landfill control system. Pipes for leachate and landfill gas are located under the trail, and several monitoring wells are located along the west side of the trail. Along the west property boundary of the transfer station are two parallel fences approximately 6 feet high.

Several single-family residences border the study area to the west and north. Land uses in the project vicinity include low-density residential, medium-density residential, office/multifamily, institutions, and open space. The open space area includes Bridle Trails State Park and the Houghton Landfill (Kirkland 2006).

Water Resources

The study area is located in the Yarrow Creek basin watershed. The boundaries of this basin are identified on the Kirkland sensitive areas map (Kirkland 2005b). Yarrow Creek originates in Bridle Trails State Park and flows approximately 3 miles before reaching Lake Washington. The ditch that flows through the study area and is just west of the Houghton Transfer Station is connected to Yarrow Creek through a culvert that conveys flow under NE 60th Street. This upstream portion of Yarrow Creek within the state park was dry at the time of Herrera's June 19, 2006 wetland delineation fieldwork.

Wetlands

The National Wetlands Inventory maps of the area do not identify any wetlands within the study area (USFWS 1988). However, the maps indicate the presence of two wetlands in the project

vicinity, located downstream within the Yarrow Creek basin (Figure 3). Neither the Kirkland sensitive areas map (Kirkland 2005b) nor the King County sensitive areas map (King County 1990) show wetlands in the study area; however, both maps indicate the presence of wetlands downstream in the Yarrow Creek basin.

Fish and Wildlife

The Yarrow Creek basin provides significant habitat for fish and wildlife species. In the past, there have been red-tailed hawk nests, eagle nests, and a blue heron rookery in the basin (Watershed Company 1998). As recently as 1998, cutthroat trout (*Oncorhynchus clarki*) were found in Yarrow Creek (King County 2001). There are barriers to fish passage downstream of the study area (Watershed Company 1998). Bridle Trails State Park provides habitat for mountain beavers, woodpeckers, owls, and ravens (Bridle Trails Park Foundation 2003).

Habitat within the study area consists of open grassy areas, shrub lands, and forested areas. There is potential habitat for small mammals, rodents, song birds, and insects. There is no permanent water in this area; therefore, it provides no habitat for fish. Because portions of the study area are seasonally ponded, there is potential habitat for amphibians. Because of a lack of large trees and snags, large birds of prey, such as bald eagles, are unlikely to nest in the study area. However, the area does provide habitat for prey species of raptors, coyotes, and other predators.

Topography

Elevations in the watershed range from approximately 420 to 500 feet above mean sea level. The elevations in the study area are roughly 430 feet above mean sea level (King County 2006).

Soil Mapping

The soil survey map of King County identifies the Alderwood soil series in the study area (SCS 1973) (Figure 4). Although the Alderwood series is not listed as a hydric soil on either the state or the national hydric soils lists (SCS 1988, 1991), it contains the following potential hydric soils inclusions: Bellingham, Norma, Shalcar, Seattle, and Tukwila soils. Alderwood gravelly sandy loam with 6 to 15 percent slopes (AgC) is mapped throughout the study area. These moderately drained soils are the most extensive soils mapped in King County and are generally found in uplands. These soils are formed within former glacial till and outwash deposits. Typically, the surface layer is a dark brown to grayish brown sandy loam, approximately 27 inches thick.

Analysis of Site Conditions

On June 19, 2006, a site visit was conducted at the Houghton Transfer Station. The entire study area was examined for the presence of streams, wetlands, and ditches.

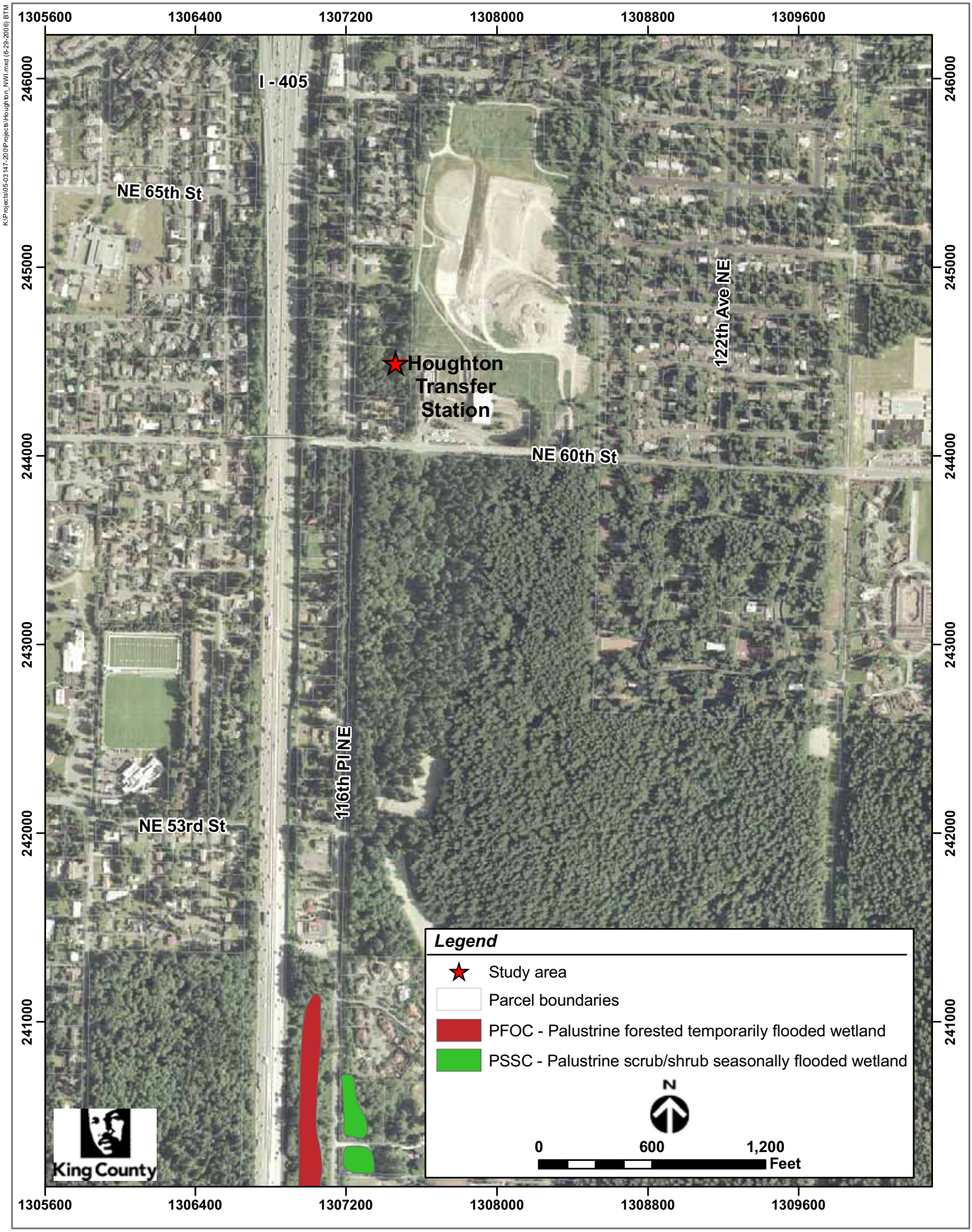


Figure 3. National Wetlands Inventory map of the Houghton Transfer Station Mitigation Project vicinity in Kirkland, Washington.

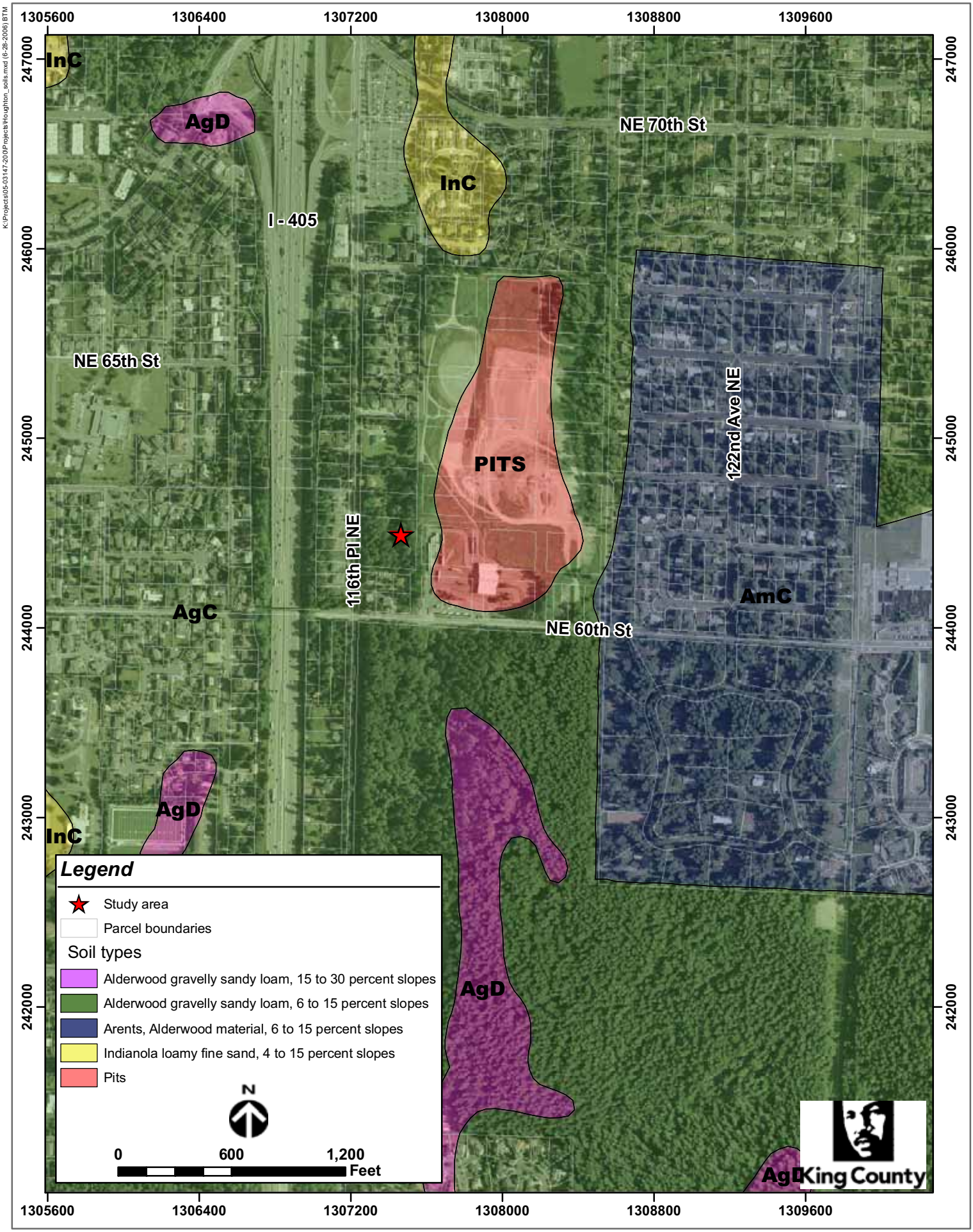


Figure 4. King County soil survey map of the Houghton Transfer Station Mitigation Project vicinity in Kirkland, Washington.

General Site Conditions

Two fences separate the Houghton Transfer Station from the 13-foot-wide gravel walking trail located in the City of Kirkland right-of-way. The fences run parallel to each other and are both approximately 6 feet high. The fence closest to the transfer station is wooden; the fence closest to the gravel walking trail is chain-link containing red plastic strips. A narrow strip of landscape trees is located between the fences and the transfer station trailer lot.

To the west of the walking trail is a ditch that flows from north to south (Photo 1 in Appendix A). The ditch receives flow from direct precipitation and stormwater runoff, then discharges into a culvert located under NE 60th Street, which discharges into Yarrow Creek. A bioswale has been constructed in the section of the ditch that is located just north of NE 60th Street. A roadside ditch is also present along the north side of NE 60th Street, to the south of the transfer station (see Figure 2).

Wetland Conditions

The study area was examined for vegetation, soils, and hydrology meeting wetland criteria. Project biologists delineated one wetland (Wetland A) in the study area, as described below and depicted in Figure 2. Representative photographs of both upland and wetland communities in the study area are included in Appendix A. Field data sheets for this wetland are provided in Appendix B. The City of Kirkland Wetland Field Data Form for Wetland A is provided in Appendix C.

Wetland A is located north of NE 60th Street and west of the Houghton Transfer Station (Figure 2). The wetland covers 5,897 square feet (0.135 acre), and is located in a topographic depression with a highly constricted outlet to the ditch that runs along the eastern edge of the wetland. The contributing basin is approximately 5 acres in size. According to the hydrogeomorphic classification system (Brinson 1993), Wetland A is a depressional outflow wetland.

Table 2 lists the plant species observed in both upland and wetland plant communities in the study area. The species are identified according to vegetation stratum and listed by scientific and common names (USFWS 1993).

According to the U.S. Fish and Wildlife Service classification system (Cowardin et al. 1979), Wetland A contains one dominant vegetation community: palustrine forested wetland. Vegetation in the wetland is dominated by black cottonwood (*Populus balsamifera*), Pacific willow (*Salix lucida*), Scouler's willow (*Salix scouleriana*), Douglas spirea (*Spirea douglasii*), yellow flag iris (*Iris pseudacorus*), nightshade (*Solanum dulcamara*), and reed canarygrass (*Phalaris arundinacea*).

Six test plots were examined in the wetland and in the surrounding upland (see Figure 2). Test plots TP-1 and TP-2 were located in the ditch along the eastern edge of the wetland; neither of

these test plots had indicators of wetland conditions. West of the ditch, four test plots were examined. Test plots TP-4 and TP-5 did not have wetland indicators and were determined to be uplands; test plots TP-3 and TP-6 did have wetland indicators and were used to determine the boundaries of the wetland.

Table 2. Plant species observed within the study area for the Houghton Transfer Station Mitigation Project.

Vegetation Stratum	Scientific Name	Common Name	Indicator Status
Trees	*Acer macrophyllum*	Big-leaf maple	FACU
	Alnus rubra	Red alder	FAC
	Populus balsamifera	Black cottonwood	FAC
	Pseudotsuga menziesii	Douglas-fir	UPL
	Quercus palustris	Pin oak	UPL
	Salix lucida	Pacific willow	FACW+
	Salix sitchensis	Sitka willow	FACW
	Thuja plicata	Western red cedar	FAC
Shrubs	*Acer circinatum*	Vine maple	FACU+
	Rubus armeniacus	Himalayan blackberry	FACU
	Rubus spectabilis	Salmonberry	FAC
	Salix scouleriana	Scouler's willow	FAC
	Spirea douglasii	Douglas spirea	FACW
Herbaceous Species	*Equisetum arvense*	Horsetail	FAC
	Geranium robertianum	Robert geranium	UPL
	Iris pseudacorus	Yellow flag iris	OBL
	Phalaris arundinacea	Reed canarygrass	FACW
	Polystichum munitum	Sword fern	FACU
	Rubus ursinus	Trailing blackberry	FACU
	Solanum dulcamara	Nightshade	FAC

Note: A + suffix following the indicator symbol FACW, FAC, or FACU indicates plants with a somewhat higher probability of occurring in wetlands. A – suffix following the indicator symbol FACW, FAC, or FACU indicates plants with a somewhat lower probability of occurring in wetlands.

Test plot TP-3 is located near the southwestern edge of the wetland. At this location, the hydric indicator is low-chroma soils combined with the presence of mottles. Observations included very dark brown (10YR 2/2) silty clay loam from the surface to 9 inches in depth and very dark grayish brown (10YR 3/2) silty clay loam from 9 to 16 inches in depth, with strong brown (7.5YR 4/6) mottles throughout the profile. The dominant vegetation observed in test plot TP-3 consisted of Douglas spirea and reed canarygrass, both hydrophytic species. The wetland delineation was completed outside of the early growing season and the only indicators of wetland hydrology were water-stained leaves and a positive FAC neutral test. The stained leaves indicate that sustained hydrology is present at some time during the year. Wetland hydrology is assumed earlier in the growing season due to the strong wetland indicators observed in the soil and the vegetation.

Test plot TP-6 is located near the northern edge of the wetland. At this test plot, the hydric soil indicator is low-chroma soils combined with the presence of mottles. The observed soils were very dark brown (10YR 3/2) sandy loam from the surface to 4 inches in depth, with yellowish red (5YR 5/8) mottles. From 4 to 16 inches in depth, the soil was dark grayish brown loamy sand (2.5Y 4/2), with yellowish red mottles (5YR 4/6). The hydrophytic vegetation observed in test plot TP-6 included Douglas spirea, yellow flag iris, and reed canarygrass. Similar to test plot TP-3, the only indicators of wetland hydrology at test plot TP-6 were water-stained leaves and a positive FAC neutral test. The strong indictors of wetland soil and vegetation indicate that wetland hydrology is likely present earlier in the growing season.

Regulatory Implications

Clean Water Act

The Houghton Transfer Station Mitigation Project will occur outside of all wetlands and will not involve dredging or filling of wetlands. Therefore, neither a U.S. Army Corps of Engineers Section 404 permit nor an Ecology Section 401 permit will be required for wetland impacts.

City of Kirkland Zoning Code

The Houghton Transfer Station Mitigation Project is subject to the wetland and buffer regulations in the City of Kirkland Zoning code (KZC). Based on the City of Kirkland wetland rating system, Wetland A is rated as a Type 2 wetland because it not meet the criteria for a Type 1 wetland, and it merits more than 22 points on the wetland field data form (Kirkland 2005a). The City of Kirkland sensitive area maps (Kirkland 2005b) show that the study area is located in the Yarrow Creek basin, which is listed as a primary basin in the KZC (Kirkland 2005a). A Type 2 wetland that is located in a primary basin is required to have a 75-foot buffer width; therefore, Wetland A has a prescribed buffer width of 75 feet measured from the delineated wetland edge. In addition, the KZC requires that all structures be set back 10 feet from the designated or modified wetland buffer. Any impacts to a wetland buffer must be approved by the City of Kirkland Hearing Examiner before project construction begins.

Potential Project Impacts

The Houghton Transfer Station Mitigation Project proposes to place a new sound wall adjacent to the buffer of Wetland A, approximately 60 feet to the east of the wetland edge. The sound wall will be 6 feet high within the buffer and the building setback area, and will be 12 feet high elsewhere. The sound wall will follow the alignment of the existing fences and will be located adjacent to the 13-foot-wide gravel walking trail (Figure 2). Construction of the 6-foot-high sound wall is considered routine maintenance, as it will replace the existing 6-foot-high fences within the buffer. Therefore, the work is exempt from the conditions in KZC Chapter 90-Drainage Basins (Kirkland 2005a). The sound wall construction area that is within 75 feet of Wetland A does not currently function as a wetland buffer; it is already developed, containing two fences and a trailer parking lot, and the area is vegetated with only a row of landscape trees on the east side of the fence. All construction activities related to the sound wall installation will occur within and to the east of the existing gravel path. The row of trees will be preserved, and the trail will be restored to the condition it was in prior to construction. Therefore, no impacts will occur within any area currently functioning as wetland buffer.

References

Bridle Tails Park Foundation. 2003. The Bridle Trails Park Foundation Natural History and Park Animals website. Obtained June 30, 2006, from organization website: <http://www.bridletrails.org/natural_history_3.htm>.

Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Technical Report WRP-DE-4. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Virginia. August 1993.

Cooke, S. 1997. A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon. Seattle Audubon Society and Washington Native Plant Society, Seattle, Washington.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Publication FWS/OBS-79/31. U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services.

Ecology. 1997. Washington State Wetlands Identification and Delineation Manual. Ecology Publication 96-94. Washington State Department of Ecology, Olympia, Washington.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Hruby, T. 2004. Washington State Wetland Rating System for Western Washington—Revised. Ecology Publication 04-06-025. Washington State Department of Ecology, Olympia, Washington. August 2004.

King County. 1990. Sensitive Areas Map Folio, King County, Washington. Department of Parks, Planning, and Resources; Planning and Community Development Division.

King County. 2001. Known Freshwater Distribution of Salmon and Trout for Water Resources Inventory Area 8. King County Washington Department of Natural Resources and Parks. Obtained June 29, 2006, from county website: <http://dnr.metrokc.gov/Wrias/8/fish-maps/distmap.htm>.

King County. 2006. King County iMAP. Obtained June 27, 2006, from county website: <http://www.metrokc.gov/gis/Mapportal/iMAP_main.htm#>.

Kirkland, City of. 2005a. City of Kirkland Zoning Code. Obtained June 27, 2006, from city website: <http://search.mrsc.org/nxt/gateway.dll/kirkzone?f=templates&fn=kirkzpage.htm$vid=municodes: KirklandZoning>.

APPENDIX A

Photographic Documentation

Houghton Transfer Station Improvements
Wetland Delineation
Photographic Log

Photo Number	Photo Description
1	View of gravel walking trail facing south. The ditch is to the west and the fence that is proposed for replacement by the sound wall is to the east.
2	View of Wetland A, facing west.
3	View of Wetland A, facing southwest.
4	View of the upland vegetation around Wetland A.

1

2

3

4

APPENDIX B

Routine Wetland Determination Forms

DATA FORM 1 (*REVISED*)
ROUTINE WETLAND DETERMINATION
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual

Project/Site:	King County Houghton Transfer Station	Date:	6/19/2006
Applicant/Owner:	King County Solid Waste Division	County:	King
		State:	Washington
Investigator(s):	Darcey Miller and Maureen Minister	S/T/R:	9/25N/5E

Do Normal Circumstances exist on the site?	Yes ☒	No ☐	Community ID:	Upland Forest
Is the site significantly disturbed (atypical situation)?	Yes ☐	No ☒	Transect ID:	
Is the area a potential Problem Area?	Yes ☐	No ☒	Plot ID:	Test Plot 1

Explanation of atypical or problem area:

VEGETATION (for strata, indicate T = tree; S = shrub; H = herb; V = vine)

Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator	Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator
Acer macrophyllum	☒	T	50	FACU		☐			
Populus balsamifera	☒	T	20	FAC		☐			
Thuja plicata	☒	T	30	FAC		☐			
Rubus armeniacus	☒	S	20	FACU		☐			
Rubus ursinus	☒	H	10	FACU		☐			
	☐					☐			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, and FAC 40 %

Check all indicators that apply and explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation:	☐	Physiological/reproductive adaptations	☐
		Wetland plant database	☒
Morphological adaptations	☐	Personal knowledge of regional plant communities	☐
Technical Literature	☒	Other (explain)	☐

Hydrophytic vegetation present? Yes ☐ No ☒

Rationale for decision/remarks: Hydrophytic vegetation is less than 50% of the composition of the dominant species. The dominant FAC trees are located outside of ditch. The dominant species (Acer macrophyllum) is FACU.

HYDROLOGY

Is it the growing season? Yes ☒ No ☐	Water Marks: Yes ☐ No ☒ on	Sediment Deposits: Yes ☐ No ☒
Based on: _____ soil temp (record temp _____) X other (explain) summer season, active plant growth	Drift Lines: Yes ☐ No ☒	Drainage Patterns: Yes ☐ No ☒
Depth of inundation: none inches	Oxidized Root (live roots) Channels <12 in. Yes ☐ No ☒	Local Soil Survey: Yes ☐ No ☒
Depth to free water in pit: >16 inches Depth to saturated soil: >16 inches	FAC Neutral: Yes ☐ No ☒	Water-stained Leaves: Yes ☒ No ☐
Check all that apply and explain below: Stream, lake, or gauge data: ☐ Aerial photographs: ☐ Other: ☐	Other (explain):	

Wetland hydrology present? Yes ☐ No ☒

Rationale for decision/remarks: The only indicator of hydrology is water stained leaves. This is a stormwater drainage ditch. Water staining is presumed to be from stormwater conveyance, not wetland conditions.

SOILS

Map Unit Name (Series & Phase): Alderwood gravelly sandy loam — Drainage Class: Moderately well drained

Taxonomy (subgroup): Entic Durochrepts — Field observations confirm mapped type? Yes ☒ No ☐

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-8	A	10YR 2/2	N/A	N/A	gravelly sandy loam	
8-16	B	10YR 3/2	N/A	N/A	gravelly sandy loam	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? Yes ☐ No ☒

Rationale for decision/remarks: There were no indicators of hydric soil present.

WETLAND DETERMINATION

Hydrophytic vegetation present? Yes ☐ No ☒

Hydric soils present? Yes ☐ No ☒

Wetland hydrology present? Yes ☐ No ☒ — Is the sampling point within a wetland? Yes ☐ No ☒

Rationale/Remarks: None of the wetland criteria were found.

DATA FORM 1 (*REVISED*)
ROUTINE WETLAND DETERMINATION
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual

Project/Site:	King County Houghton Transfer Station	Date:	6/19/2006
Applicant/Owner:	King County Solid Waste Division	County:	King
		State:	Washington
Investigator(s):	Darcey Miller and Maureen Minister	S/T/R:	9/25N/5E

Do Normal Circumstances exist on the site?	Yes ☒	No ☐	Community ID:	Upland Forest
Is the site significantly disturbed (atypical situation)?	Yes ☐	No ☒	Transect ID:	
Is the area a potential Problem Area?	Yes ☐	No ☒	Plot ID:	Test Plot 2

Explanation of atypical or problem area:

VEGETATION (for strata, indicate T = tree; S = shrub; H = herb; V = vine)

Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator	Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator
Alnus rubra	☐	T	10	FAC	*Rubus ursinus*	☒	H	20	FACU
Populus balsamifera	☒	T	50	FAC		☐			
Thuja plicata	☒	T	20	FAC		☐			
Rubus armeniacus	☒	S	25	FACU		☐			
Rubus spectabilis	☒	S	20	FAC+		☐			
Polystichum munitum	☒	H	10	FACU		☐			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, and FAC 50%

Check all indicators that apply and explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation:	☐	Physiological/reproductive adaptations	☐
		Wetland plant database	☒
Morphological adaptations	☐	Personal knowledge of regional plant communities	☐
Technical Literature	☒	Other (explain)	☐

Hydrophytic vegetation present? Yes ☐ No ☒

Rationale for decision/remarks: Hydrophytic vegetation is not more than 50% of the composition of the dominant species. The dominant FAC trees are located outside of ditch.

HYDROLOGY

Is it the growing season? Yes ☒ No ☐	Water Marks: Yes ☐ No ☒ on	Sediment Deposits: Yes ☐ No ☒
Based on: _____ soil temp (record temp _____) X other (explain) summer season, active plant growth	Drift Lines: Yes ☐ No ☒	Drainage Patterns: Yes ☐ No ☒
Depth of inundation: none inches	Oxidized Root (live roots) Channels <12 in. Yes ☐ No ☒	Local Soil Survey: Yes ☐ No ☒
Depth to free water in pit: >16 inches Depth to saturated soil: >16 inches	FAC Neutral: Yes ☐ No ☒	Water-stained Leaves: Yes ☒ No ☐
Check all that apply and explain below: Stream, lake, or gauge data: ☐ Aerial photographs: ☐ Other: ☐	Other (explain):	

Wetland hydrology present? Yes ☐ No ☒

Rationale for decision/remarks: The only indicator is water stained leaves. This is a stormwater drainage ditch. Water staining is presumed to be from stormwater conveyance, not wetland conditions.

SOILS

Map Unit Name (Series & Phase): Alderwood gravelly sandy loam — Drainage Class: Moderately well drained

Taxonomy (subgroup): Entic Durochrepts — Field observations confirm mapped type? Yes ☐ No ☒

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-5	A	10YR 3/2	N/A	N/A	sandy clay loam	
5-16	B	10YR 3/2	N/A	N/A	sandy loam	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? Yes ☐ No ☒

Rationale for decision/remarks: There were no indicators of hydric soil present.

WETLAND DETERMINATION

Hydrophytic vegetation present? Yes ☐ No ☒

Hydric soils present? Yes ☐ No ☒

Wetland hydrology present? Yes ☐ No ☒ — Is the sampling point within a wetland? Yes ☐ No ☒

Rationale/Remarks: None of the wetland criteria were found.

DATA FORM 1 (*REVISED*)
ROUTINE WETLAND DETERMINATION
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual

Project/Site:	King County Houghton Transfer Station	Date:	6/19/2006
Applicant/Owner:	King County Solid Waste Division	County:	King
		State:	Washington
Investigator(s):	Darcey Miller and Maureen Minister	S/T/R:	9/25N/5E

Do Normal Circumstances exist on the site?	Yes ☒	No ☐	Community ID:	Forested Wetland
Is the site significantly disturbed (atypical situation)?	Yes ☐	No ☒	Transect ID:	
Is the area a potential Problem Area?	Yes ☐	No ☒	Plot ID:	Test Plot 3

Explanation of atypical or problem area:

VEGETATION (for strata, indicate T = tree; S = shrub; H = herb; V = vine)

Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator	Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator
Salix lucida	☒	T	5	FACW+	*Rubus ursinus*	☒	H	20	FACU
Salix scouleriana	☒	T	10	FAC	*Solanum dulcamara*	☒	H	15	FAC+
Thuja plicata	☒	T	10	FAC		☐			
Spirea douglasii	☒	S	50	FACW		☐			
Equisetum arvense	☐	H	5	FAC		☐			
Phalaris arundinacea	☒	H	20	FACW		☐			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, and FAC 86%

Check all indicators that apply and explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation:	☐	Physiological/reproductive adaptations	☐
Morphological adaptations	☐	Wetland plant database	☒
Technical Literature	☒	Personal knowledge of regional plant communities	☐
		Other (explain)	☐

Hydrophytic vegetation present? Yes ☒ No ☐

Rationale for decision/remarks: More than 50% of the dominant plant species were hydrophytic.

HYDROLOGY

Is it the growing season? Yes ☒ No ☐	Water Marks: Yes ☐ No ☒ on	Sediment Deposits: Yes ☐ No ☒
Based on: _____ soil temp (record temp _____) X other (explain) summer season, active plant growth	Drift Lines: Yes ☐ No ☒	Drainage Patterns: Yes ☒ No ☐
Depth of inundation: none inches	Oxidized Root (live roots) Channels <12 in. Yes ☐ No ☒	Local Soil Survey: Yes ☐ No ☒
Depth to free water in pit: >16 inches Depth to saturated soil: >16 inches	FAC Neutral: Yes ☒ No ☐	Water-stained Leaves: Yes ☒ No ☐
Check all that apply and explain below: Stream, lake, or gauge data: ☐ Aerial photographs: ☐ Other: ☐	Other (explain):	

Wetland hydrology present? Yes ☒ No ☐

Rationale for decision/remarks: Secondary hydrology indicators include a positive FAC Neutral test and water stained leaves. Water stained leaves indicate that hydrology is present at some time during the year. The wetland delineation was completed outside of the early growing season. Saturation near the surface is expected earlier in the growing season.

SOILS

Map Unit Name (Series & Phase): Alderwood gravelly sandy loam — Drainage Class: Moderately well drained

Taxonomy (subgroup): Entic Durochrepts — Field observations confirm mapped type? Yes ☐ No ☒

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-9	A	10YR 2/2	7.5YR 4/6	Common, medium, prominent	silty clay loam	Within in the B horizon there was a thin lens of medium grain sand.
9-16	B	10YR 3/2	7.5YR 4/6	Common, medium, prominent	silty clay loam	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? Yes ☒ No ☐

Rationale for decision/remarks: Soil is chroma 2, with redox features.

WETLAND DETERMINATION

Hydrophytic vegetation present? Yes ☒ No ☐

Hydric soils present? Yes ☒ No ☐

Wetland hydrology present? Yes ☒ No ☐ — Is the sampling point within a wetland? Yes ☒ No ☐

Rationale/Remarks: All three criteria were met.

DATA FORM 1 (*REVISED*)
ROUTINE WETLAND DETERMINATION
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual

Project/Site:	King County Houghton Transfer Station	Date:	6/19/2006
Applicant/Owner:	King County Solid Waste Division	County:	King
		State:	Washington
Investigator(s):	Darcey Miller and Maureen Minister	S/T/R:	9/25N/5E

Do Normal Circumstances exist on the site?	Yes ☒	No ☐	Community ID:	Upland Forest
Is the site significantly disturbed (atypical situation)?	Yes ☐	No ☒	Transect ID:	
Is the area a potential Problem Area?	Yes ☐	No ☒	Plot ID:	Test Plot 4

Explanation of atypical or problem area:

VEGETATION (for strata, indicate T = tree; S = shrub; H = herb; V = vine)

Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator	Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator
Thuja plicata	☒	T	25	FAC		☐			
Rubus spectabilis	☒	S	15	FAC+		☐			
Geranium robertianum	☒	H	50	nol		☐			
Polystichum munitum	☒	H	20	FACU		☐			
	☐					☐			
	☐					☐			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, and FAC 50%

Check all indicators that apply and explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation:	☐	Physiological/reproductive adaptations	☐
		Wetland plant database	☒
Morphological adaptations	☐	Personal knowledge of regional plant communities	☐
Technical Literature	☒	Other (explain)	☐

Hydrophytic vegetation present? Yes ☐ No ☒

Rationale for decision/remarks: Only 50% of the dominant species were hydrophytic.

HYDROLOGY

Is it the growing season? Yes ☒ No ☐	Water Marks: Yes ☐ No ☒ on	Sediment Deposits: Yes ☐ No ☒
Based on: _____ soil temp (record temp _____) X other (explain) summer season, active plant growth	Drift Lines: Yes ☐ No ☒	Drainage Patterns: Yes ☐ No ☒
Depth of inundation: none inches	Oxidized Root (live roots) Channels <12 in. Yes ☐ No ☒	Local Soil Survey: Yes ☐ No ☒
Depth to free water in pit: >16 inches Depth to saturated soil: >16 inches	FAC Neutral: Yes ☐ No ☒	Water-stained Leaves: Yes ☐ No ☒
Check all that apply and explain below: Stream, lake, or gauge data: ☐ Aerial photographs: ☐ Other: ☐	Other (explain):	

Wetland hydrology present? Yes ☐ No ☒

Rationale for decision/remarks: There were no indicators of wetland hydrology present at this data plot.

SOILS

Map Unit Name (Series & Phase): Alderwood gravelly sandy loam

Drainage Class: Moderately well drained

Taxonomy (subgroup): Entic Durochrepts

Field observations confirm mapped type? Yes ☒ No ☐

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-8	A	10YR 2/2	N/A	N/A	sandy loam	
8-16	B	10YR 3/4	N/A	N/A	loamy sand	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? Yes ☐ No ☒

Rationale for decision/remarks: There were no indicators of hydric soil present at this data plot.

WETLAND DETERMINATION

Hydrophytic vegetation present? Yes ☐ No ☒

Hydric soils present? Yes ☐ No ☒

Wetland hydrology present? Yes ☐ No ☒

Is the sampling point within a wetland? Yes ☐ No ☒

Rationale/Remarks: None of the indicators were present.

DATA FORM 1 (*REVISED*)
ROUTINE WETLAND DETERMINATION
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual

Project/Site:	King County Houghton Transfer Station	Date:	6/19/2006
Applicant/Owner:	King County Solid Waste Division	County:	King
		State:	Washington
Investigator(s):	Darcey Miller and Maureen Minister	S/T/R:	9/25N/5E

Do Normal Circumstances exist on the site?	Yes ☒	No ☐	Community ID:	Forested Upland
Is the site significantly disturbed (atypical situation)?	Yes ☐	No ☒	Transect ID:	
Is the area a potential Problem Area?	Yes ☐	No ☒	Plot ID:	Test Plot 5

Explanation of atypical or problem area:

VEGETATION (for strata, indicate T = tree; S = shrub; H = herb; V = vine)

Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator	Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator
Rubus armeniacus	☒	S	20	FACU		☐			
Salix scouleriana	☒	S	25	FAC		☐			
Spiraea douglasii	☒	S	50	FACW		☐			
Rubus ursinus	☒	H	20	FACU		☐			
Solanum dulcamara	☒	H	30	FAC+		☐			
	☐					☐			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, and FAC 60%

Check all indicators that apply and explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation:	☐	Physiological/reproductive adaptations	☐
Morphological adaptations	☐	Wetland plant database	☒
Technical Literature	☒	Personal knowledge of regional plant communities	☐
		Other (explain)	☐

Hydrophytic vegetation present? Yes ☒ No ☐

Rationale for decision/remarks: Greater than 50% of the dominant vegetation is hydrophytic.

HYDROLOGY

Is it the growing season? Yes ☒ No ☐	Water Marks: Yes ☐ No ☒ on	Sediment Deposits: Yes ☐ No ☒
Based on: _____ soil temp (record temp _____) X other (explain) summer season, active plant growth	Drift Lines: Yes ☐ No ☒	Drainage Patterns: Yes ☐ No ☒
Depth of inundation: none inches	Oxidized Root (live roots) Channels <12 in. Yes ☐ No ☒	Local Soil Survey: Yes ☐ No ☒
Depth to free water in pit: >16 inches Depth to saturated soil: >16 inches	FAC Neutral: Yes ☐ No ☒	Water-stained Leaves: Yes ☐ No ☒
Check all that apply and explain below: Stream, lake, or gauge data: ☐ Aerial photographs: ☐ Other: ☐	Other (explain):	

Wetland hydrology present? Yes ☐ No ☒

Rationale for decision/remarks: There were no indicators of wetland hydrology present at this data plot.

SOILS

Map Unit Name (Series & Phase): Alderwood gravelly sandy loam

Drainage Class: Moderately well drained

Taxonomy (subgroup): Entic Durochrepts

Field observations confirm mapped type? Yes ☐ No ☒

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-5	A	10YR 2/2	5YR 4/6	few, medium, prominent	loam	
5-16	B	10YR 4/6	N/A	No streaking	loamy sand	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? Yes ☐ No ☒

Rationale for decision/remarks: There were no indicators of hydric soil present at this data plot. Chroma 2 soil with redox features must be immediately below the A horizon to be considered hydric.

WETLAND DETERMINATION

Hydrophytic vegetation present? Yes ☒ No ☐

Hydric soils present? Yes ☐ No ☒

Wetland hydrology present? Yes ☐ No ☒

Is the sampling point within a wetland? Yes ☐ No ☒

Rationale/Remarks: Two of the three criteria were not met.

DATA FORM 1 (*REVISED*)
ROUTINE WETLAND DETERMINATION
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual

Project/Site:	King County Houghton Transfer Station	Date:	6/19/2006
Applicant/Owner:	King County Solid Waste Division	County:	King
		State:	Washington
Investigator(s):	Darcey Miller and Maureen Minister	S/T/R:	9/25N/5E

Do Normal Circumstances exist on the site?	Yes ☒	No ☐	Community ID:	Forested Wetland
Is the site significantly disturbed (atypical situation)?	Yes ☐	No ☒	Transect ID:	
Is the area a potential Problem Area?	Yes ☐	No ☒	Plot ID:	Test Plot 6

Explanation of atypical or problem area:

VEGETATION (for strata, indicate T = tree; S = shrub; H = herb; V = vine)

Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator	Plant Species (✓ = Dominant)		Stratum	% Cover	Indicator
Spiraea douglasii	☒	S	40	FACW		☐			
Iris pseudacorus	☒	H	40	OBL		☐			
Phalaris arundinacea	☒	H	25	FACW		☐			
Rubis ursinus	☒	H	30	FACU		☐			
Solanum dulamara	☐	H	20	FAC+		☐			
	☐					☐			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, and FAC 75%

Check all indicators that apply and explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation:	☐	Physiological/reproductive adaptations	☐
Morphological adaptations	☐	Wetland plant database	☒
Technical Literature	☒	Personal knowledge of regional plant communities	☐
		Other (explain)	☐

Hydrophytic vegetation present? Yes ☒ No ☐

Rationale for decision/remarks: More than 50% of the dominant plant species were hydrophytic.

HYDROLOGY

Is it the growing season? Yes ☒ No ☐	Water Marks: Yes ☐ No ☒ on	Sediment Deposits: Yes ☐ No ☒
Based on: _____ soil temp (record temp _____) X other (explain) summer season, active plant growth	Drift Lines: Yes ☐ No ☒	Drainage Patterns: Yes ☒ No ☐
Depth of inundation: none inches	Oxidized Root (live roots) Channels <12 in. Yes ☐ No ☒	Local Soil Survey: Yes ☐ No ☒
Depth to free water in pit: >16 inches Depth to saturated soil: >16 inches	FAC Neutral: Yes ☒ No ☐	Water-stained Leaves: Yes ☒ No ☐
Check all that apply and explain below: Stream, lake, or gauge data: ☐ Aerial photographs: ☐ Other: ☐	Other (explain):	

Wetland hydrology present? Yes ☒ No ☐

Rationale for decision/remarks: Secondary hydrology indicators include a positive FAC Neutral test and water stained leaves. Water stained leaves indicate that hydrology is present at some time during the year. The wetland delineation was completed outside of the early growing season. Saturation near the surface is expected earlier in the growing season.

SOILS

Map Unit Name (Series & Phase): Alderwood gravelly sandy loam — Drainage Class: Moderately well drained

Taxonomy (subgroup): Entic Durochrepts — Field observations confirm mapped type? Yes ☐ No ☒

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-4	A	10YR 3/2	5YR 5/8	Common, medium, prominent	sandy loam	The soil in the A horizon was moist.
4-16	B	2.5Y 4/2	5YR 4/6	Many, coarse, prominent	loamy sand	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? Yes ☒ No ☐

Rationale for decision/remarks: Soil is chroma 2, with redox features.

WETLAND DETERMINATION

Hydrophytic vegetation present? Yes ☒ No ☐

Hydric soils present? Yes ☒ No ☐

Wetland hydrology present? Yes ☒ No ☐ — Is the sampling point within a wetland? Yes ☒ No ☐

Rationale/Remarks: All three criteria were met.

APPENDIX C

City of Kirkland
Wetland Field Data Form

Plate 26
WETLAND FIELD DATA FORM

WETLAND FIELD DATA FORM

BEGIN BY CHECKING ANY OF THE FOLLOWING (a. – e.) THAT APPLY:

a. The wetland is contiguous to Lake Washington;

b. The wetland contains at least 1/4 acre of organic soils, such as peat bogs or mucky soils;

c. The wetland is equal to or greater than 10 acres in size and having three or more wetland classes, as defined by the U.S. Fish & Wildlife Service (Cowardin et al., 1979), one of which is open water;

d. The wetland has significant habitat value to state or federally listed threatened or endangered wildlife species; or

e. The wetland contains state or federally listed threatened or endangered plant species.

IF ANY OF THE CRITERIA LISTED ABOVE ARE MET, THEN THE WETLAND IS CONSIDERED TO BE TYPE 1. IF THAT IS THE CASE, PLEASE CONTINUE TO COMPLETE THE ENTIRE FORM, BUT DO NOT ASSIGN POINTS.

IF THE WETLAND DOES NOT MEET THE CRITERIA LISTED ABOVE FOR TYPE 1, COMPLETE THE ENTIRE FORM, USING THE ASSIGNED POINTS TO DETERMINE IF IT IS A TYPE 2 OR TYPE 3 WETLAND.

Type 2 wetlands typically have at least two wetland vegetation classes, are at least partially surrounded by buffers of native vegetation, connected by surface water flow (perennial or intermittent) to other wetlands or streams, and contain or are associated with forested habitat.

1. Total wetland area **2 points**

Estimate wetland area and score from choices below.

Acres	Point Value
>20.00	= 6
10-19.99	= 5
5-9.99	= 4
1-4.99	= 3
0.1-0.99	= 2
<0.1	= 1

2. Wetland classes: Determine the number of wetland classes that qualify, and score according to the table below. 3 points

Wetland Class	Number of Classes		Points
Open Water: if the area of open water is >1/3 acre or >10% of the total wetland area	1	=	1
Aquatic Beds: if the area of aquatic beds is >10% of the **open water** area **or** >1/2 acre	2	=	3
Emergent: if the area of emergent class is >1/2 acre **or** >10% of the total wetland area	3	=	5
* **Scrub-Shrub:** if the area of scrub-shrub class is >1/2 acre **or** >10% of the total wetland area	4	=	7
* **Forested:** if the area of forested class is >1/2 acre or >10% of the total wetland area	5	=	10

3. Plant species diversity. 5 points

For all wetland classes which qualified in 2 above, count the number of different plant species and score according to the table below. You do not have to name them.

e.g., if a wetland has an aquatic bed class with 3 species, an emergent class with 4 species, and a scrub-shrub class with 2 species, you would circle 2, 2, and 1 in the "points" columns (below).

Wetland Class	Number of Species		Points	Wetland Class	Number of Species		Points
Aquatic Bed	1-2	=	1	**Scrub-shrub**	1-2	=	1
	3	=	2		3-4	=	2
	>3	=	3		>4	=	3
Emergent	1-2	=	1	**Forested**	1-2	=	1
	3-4	=	2		3-4	=	2
	>4	=	3		>4	=	3

4. Structural diversity. 4 points

If the wetland has a forested class, add 1 point for each of the following attributes present:

Trees >50 feet tall = 1

Trees 20 - 49 feet tall = 1

Shrubs = 1

Herbaceous ground cover = 1

5. Interspection between wetland classes. 1 point

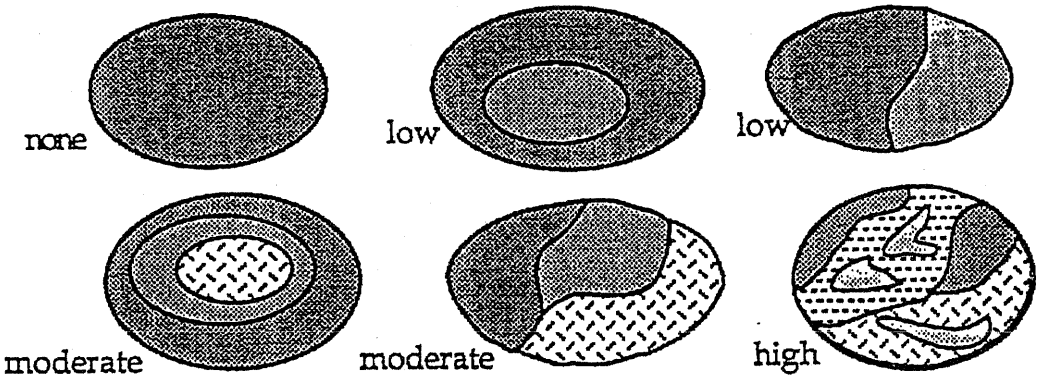
Decide from the diagrams below whether interspection between wetland classes is high, moderate, low or none

3 = High

2 = Moderate

1 = Low

0 = None



6. Habitat features 1 point

Add points associated with each habitat feature listed:

Is there evidence of current use by beavers? = 3

Is a heron rookery located within 300 feet? = 2

Are raptor nest(s) located within 300 feet? = 1

Are there at least 2 standing dead trees (snags) per acre? = 1

Are there any other perches (wires, poles, or posts)? = 1

Are there at least 3 downed logs per acre? = 1

7. Connection to streams 3 points

(score one answer only)

Is the wetland connected at any time of the year via surface water?

To a perennial stream or a seasonal stream *with* fish = 5

To a seasonal stream *without* fish = 3

Is not connected to any stream = 0

8. Buffers 3 points

Step 1: Estimate (to the nearest 5%) the percentage of each buffer or land-use type (below) that adjoins the wetland boundary. Then multiply these percentages by the factor(s) below and enter result in the column to the right.

Roads, buildings or parking lots __%_ X 0 = _____ = __

Lawn, grazed pasture, vineyards or annual crops 10% X 1 = 10 x 2 = 20

Ungrazed grassland or orchards __%_ X 2 = _____ = __

Open water or native grasslands __%_ X 3 = _____ = __

Forest or shrub 90% X 4 = 360 x 2 = 720

Add buffer total 740

Step 2: Multiply result(s) of step 1:

By 1 if buffer width is 25-50 feet

By 2 if buffer width is 50-100 feet

By 3 if buffer width is >100 feet

Enter results and add subscores

Step 3: Score points according to the following table:

Buffer Total

900-1200 = 4

600-899 = 3

300-599 = 2

100-299 = 1

9. Connection to other habitat areas: 1 point

Is there a riparian corridor to other wetlands within 0.25 of a mile, or a corridor >100 feet wide with good forest or shrub cover to any other habitat area? = 5

Is there a narrow corridor <100 feet wide with good cover or a wide corridor >100' wide with low cover to any other habitat area? = 3

✓ Is there a narrow corridor <100 feet wide with low cover or a significant habitat area within 0.25 mile but no corridor? = 1

Is the wetland and buffer completely isolated by development and/or cultivated agricultural land? = 0

10. Scoring

Add the scores to get a total: 23

Question: Is the total greater than or equal to 22 points?

Answer:

Yes = Type 2

No = Type 3