Wetland and Wildlife Determination Update

Resort Semiahmoo Zone 3
Blaine, WA

for:

M: KOV, Inc.
501 Fern Road
Bellingham, WA 98225

April 29, 2016

Cantrell & Associates, Inc.
1510 Mill Avenue, Bellingham WA 98225

Introduction

This report presents the results of our wetland and wildlife determination update for the approximately 15 acre study area located at the southwest intersection of Semiahmoo Parkway and Semiahmoo Drive. The purpose of the study was to determine the existence, extent, and regulatory status of any wetlands within the subject parcel and to determine the known or likely presence of any wetlands, habitat conservation areas (HCAs), priority wildlife habitats or species in the vicinity of the study area. This report is an update to a critical areas assessment conducted by Aqua-Terr Systems, Inc. as presented in a report submitted to City of Blaine titled *Critical Areas Assessment Report: Trillium Corporation-Semiahmoo Zone 3 Parcel, City of Blaine February 2009*. That report concluded an absence of wetlands and habitat conservation areas on or in the immediate vicinity of the subject parcel. Our findings support the conclusions of the 2009 assessment.

Study Area Description

The approximately 15 acre subject parcel (APN 405110510169) is located on the south side of Semiahmoo Drive and to the west side of Semiahmoo Parkway (see *Figure 1. Vicinity Map)*. The subject parcel is forested with a mix of deciduous and evergreen trees with an understory of shrubs and low-growing, herbaceous plants. The parcel was the subject of a timber thinning harvest in association with Forest Practice Application (FPA) permit from Washington Department of Natural Resources, approved March 5, 2013 and executed shortly thereafter. Consequent to the partial-cut timber harvest, the canopy was somewhat more open than it was in 2009. Numerous earthen logging trails, slash piles and loading/staging areas were present at the time of our 2016 site visit. The logging trails and loading/staging areas were found to have a cover of hog fuel type wood chip mulch. Topography slopes to the northwest at approximately 5 percent. The property is bounded on the northwest by Semiahmoo Drive, on the east by Semiahmoo Parkway, on the north by Whatcom Fire Rescue facility and on the south by second growth forest.

Methods

We conducted site visits in April 2016 and sampled soils, vegetation and near-surface hydrology for indicators of wetland and upland conditions. We conducted a visual survey of adjacent areas from the subject property boundaries. We looked for indications of wetlands or streams which may cast buffers onto the subject parcel. We recorded data at 5 representative sample plot locations. We reviewed the information provided in the 2009 ATSI critical Areas assessment, the National Wetland Inventory, DNR maps, WDFW SalmonScapes maps, WDFW Habitats and Species maps for records of known wildlife habitats, streams, or wetlands present on or near the subject study area.

Wetland determinations were made using the techniques outlined in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (1987). Wetland determinations are based on three mandatory criteria: hydrophytic vegetation, hydric soils, and wetland hydrology. Hydrophytic vegetation consists of those plants typically adapted for life in saturated soil conditions. Hydric soils are saturated for long enough periods during the growing season to develop anaerobic and reducing conditions in the upper part. All soil color codes we list in this report and data sheets are based on the Munsell® Soil Color Charts, and the soil color names we use herein are based on the Munsell® Soil Color Name Diagram. Wetland hydrology exists when inundation or prolonged soil saturation is sufficient to create hydric soils and wetland vegetation.

Soils

The N.R.C.S. soils database maps two soil units on the parcel: *51 Everett complex, 2 to 8 percent* slopes covers the eastern bulk of the property; *48-Everett gravelly sandy loam, hard substratum, 2 to 8 percent slopes* is present at the western end of the parcel. Both units are considered non-hydric soils.

***(48) Everett gravelly sandy loam, hard substratum, 2-8 percent slopes* (listed non-hydric)** is a deep, somewhat excessively drained soil on outwash terraces and moraines. Typically, the surface is covered with a mat of undecomposed needles and twigs 2 inches thick. When mixed to a depth of 6 inches, the surface layer is dark yellowish brown (7.5YR 3/4) gravelly sandy loam. The upper 7 inches of the subsoil is dark brown (7.5YR 4/4) gravelly sandy loam. The lower 12 inches is strong brown (7.5YR 4/4) very gravelly sandy loam. The substratum is dark brown very gravelly loamy sand 16 inches thick. Dense glacial till that crushes to very gravelly loamy sand is at a depth of 41 inches. The depth to very gravelly loamy sand ranges from 14 inches to 30 inches. The depth to dense glacial till or dense glaciomarine deposits ranges from 40 to 60 inches. The dense glacial till is similar to a cemented pan. In some areas the surface layer is very gravelly sandy loam or very gravelly loam. In other areas the soil has 15-35 percent rock fragments in the subsoil, is very gravelly sandy loam in the upper part of the substratum, or has dense glacial till or dense glaciomarine deposits below a depth of 60 inches. Included in this unit are small areas of Birchbay, Clipper, Labounty, Sehome, and Squalicum soils and small areas of Everett soils that have a stony surface or have slopes of more than 8 percent or les than 2 percent. Included areas make up about 15 percent of the total acreage. Permeability is moderate in the upper part of the Everett soil, rapid and very rapid in the substratum, and very slow in the dense glacial till. Water capacity is low. The effective rooting depth is limited by a seasonal high water table which is at a depth of 3.5 to 5 feet from December through April.

***(51) Everett complex, 2 – 8% slopes* (listed non-hydric):** This map unit is on outwash terraces and moraines. It formed in a mixture of volcanic ash and alluvium over glacial outwash and glacial till. This unit is 50% Everett very gravelly sandy loam and 35% Everett gravelly sandy loam. The components of this unit occur as areas so intricately intermingled

that mapping them separately was not practical at the selected scale of mapping. Included in this unit are small areas of Birchbay, Clipper, Labounty, and Squalicum soils and small areas of Everett soils that have a stony surface, have a surface layer of very gravelly sand, or have slopes of more than 8% or les than 2%. Also included are soils that are similar to the Everett soil but have 15 – 35% rock fragments in the subsoil or have a substratum of very gravelly sandy loam. Included areas make up about 15% of the total acreage. For the Everett very gravelly sandy loam portions, permeability is rapid in the upper part and very rapid in the lower part. Available water capacity is low. The effective rooting depth is 60", runoff is slow, and the hazard of water erosion is slight. For the Everett gravelly sandy loam portions, permeability is moderate in the upper part, rapid in the next part, and very slow in the dense glacial till. Available water capacity is low. The effective rooting depth is limited by a seasonal high water table, which is at a depth of 3.5' to 5.0' from December through April. Runoff is slow, and the hazard of water erosion is slight.

Results: Wetlands

In agreement with the ATSI report, we observed no wetlands onsite or near the subject parcel (see *Figure 3. Wetland Determination Map* for sample plot locations).

We found the soils throughout the parcel to lack hydric soil signatures and to match the range of colors and textures expected of the non-hydric ***Everett*** soils. The upper soils from the surface to 1 to 12 inches below the surface were typically very dark brown (10YR 2/2) with subsoils to 16-18" were dark brown (10YR 3/3), (10YR 3/2.5), (10YR 3/3) and (7.5YR 3/4). We observed a lack of soil saturation or standing water throughout the subject parcel during our April site visit.

Vegetation was typical of local upland forests. Canopy species included: bigleaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), Douglas-fir (Pseudotsuga menziesii), western redcedar (*Thuja plicata*), grand fir (*Abies grandis*) and paper birch (*Betula papyrifera*). Shrub species included vine maple (*Acer circinatum*), snowberry (*Symphoricarpos albus*), thimble berry (*Rubus parviflorus*), salmonberry (*Rubus spectabilis*), Oso berry (*Oemleria cerasiformis*), oceanspray (*Holodiscus discolor*) and Oregon grape (*Mahonia nervosa*). Herbaceous low-growing species included sword fern (*Polystichum munitum*), stinging nettle (*Urtica dioica*), trailing blackberry (Rubus ursinus), star flower (*Trientalis borealis),* bull thistle *(Cirsium vulgare),* quackgrass *(Agropyron repens),* false dandelion *(Hypochaeris radicata),* piggy back plant (*Tolmiea menziesii),* Dewey's sedge (*Carex deweyana),* and miner's lettuce *(Claytonia perfoliata).*

Results: Streams and Wildlife

WDNR resources database do not show any streams in the vicinity of the subject parcel. WDFW Habitats and Species map does not show any priority habitats or palustrine wetlands on or in the immediate vicinity of the subject parcel. Bald Eagle breeding area

buffers have been established to the southwest and north of the subject parcel but those do not extend onto the parcel (see *Figure 2. WDFW Priority Habitats and Species Map*). Estuarine and marine wetlands, Pacific herring, Dungeness crab and hard shell clam habitat are shown to be present in the shoreline area of Semiahmoo Bay to the west and estuarine and marine wetlands, Pacific herring, Dungeness crab, waterfowl and shorebird concentrations are shown in Drayton Harbor to the north. The Washington Department of Natural Resources (WDNR) Natural Heritage Program does not identify any rare plants in the subject property or the project vicinity (WDNR website 2016). We did not observe any raptor nests, cavity nests, or other signs of priority species on or near the study area except for foraging signs of pileated woodpecker discussed in the ATSI report.

Conclusions

We observed no critical areas on or in the immediate vicinity of the subject parcel. Our conclusions are in agreement with the conclusions of the 2009 ATSI report.

Disclaimer

This critical area study is based upon physical circumstances that are described in manuals and publications utilized by Federal, State, and Local agencies. The wetland determination methodology used in this report is consistent with the routine on-site determination method prescribed by the 1987 Corps of Engineers Wetland Delineation Manual. No guarantees are given that the determination will concur exactly with those performed by agencies with jurisdiction or by other qualified professionals. The Corps of Engineers are available to make wetland determination verifications upon request. This report is provided for the use and distribution of the named recipient and is not intended for use by other parties for any other purpose.

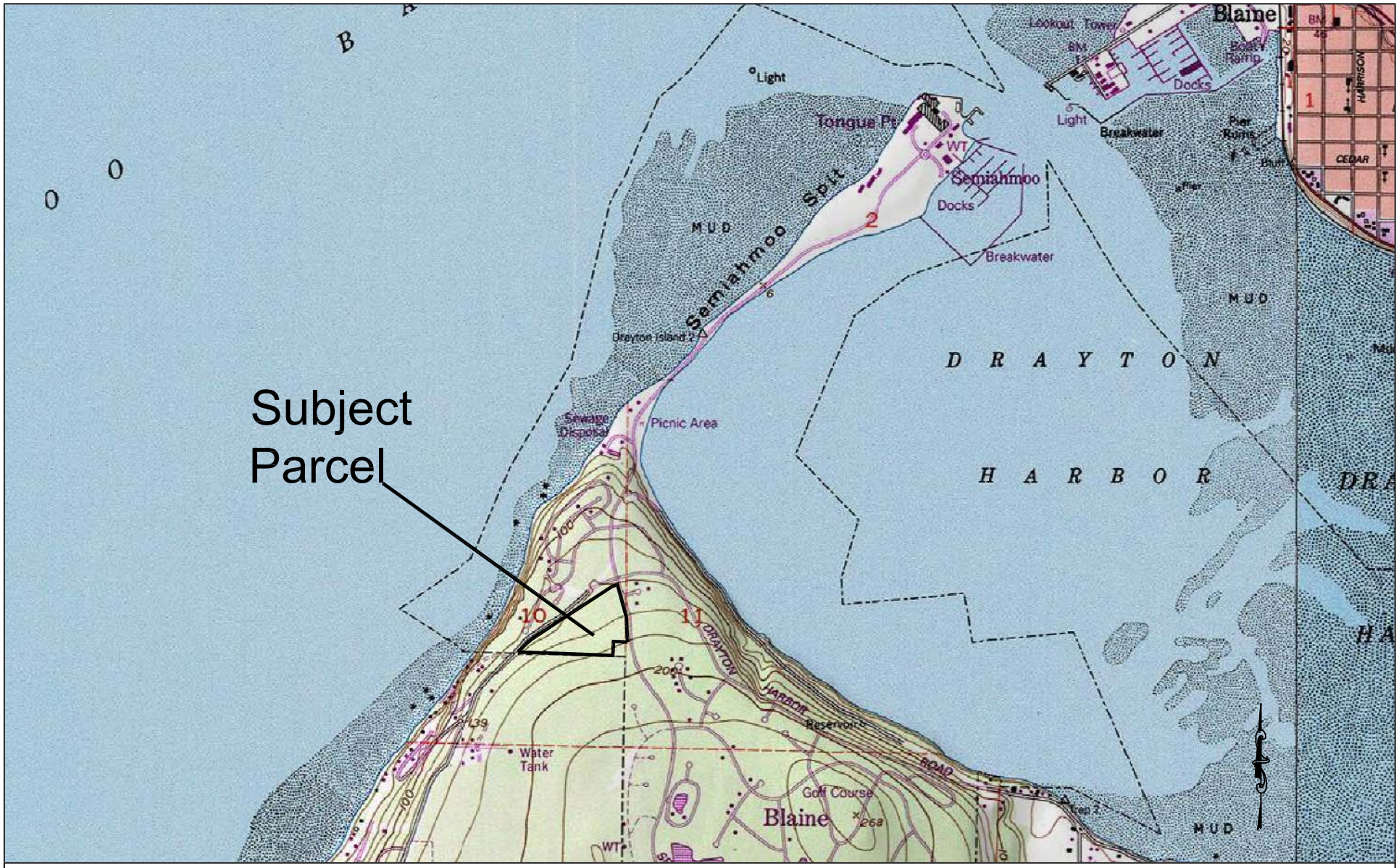

Figure 1. Vicinity Map
Resort Semiahmoo Zone 3
Parcel 405110 510169

0 2,000'

April 29, 2016

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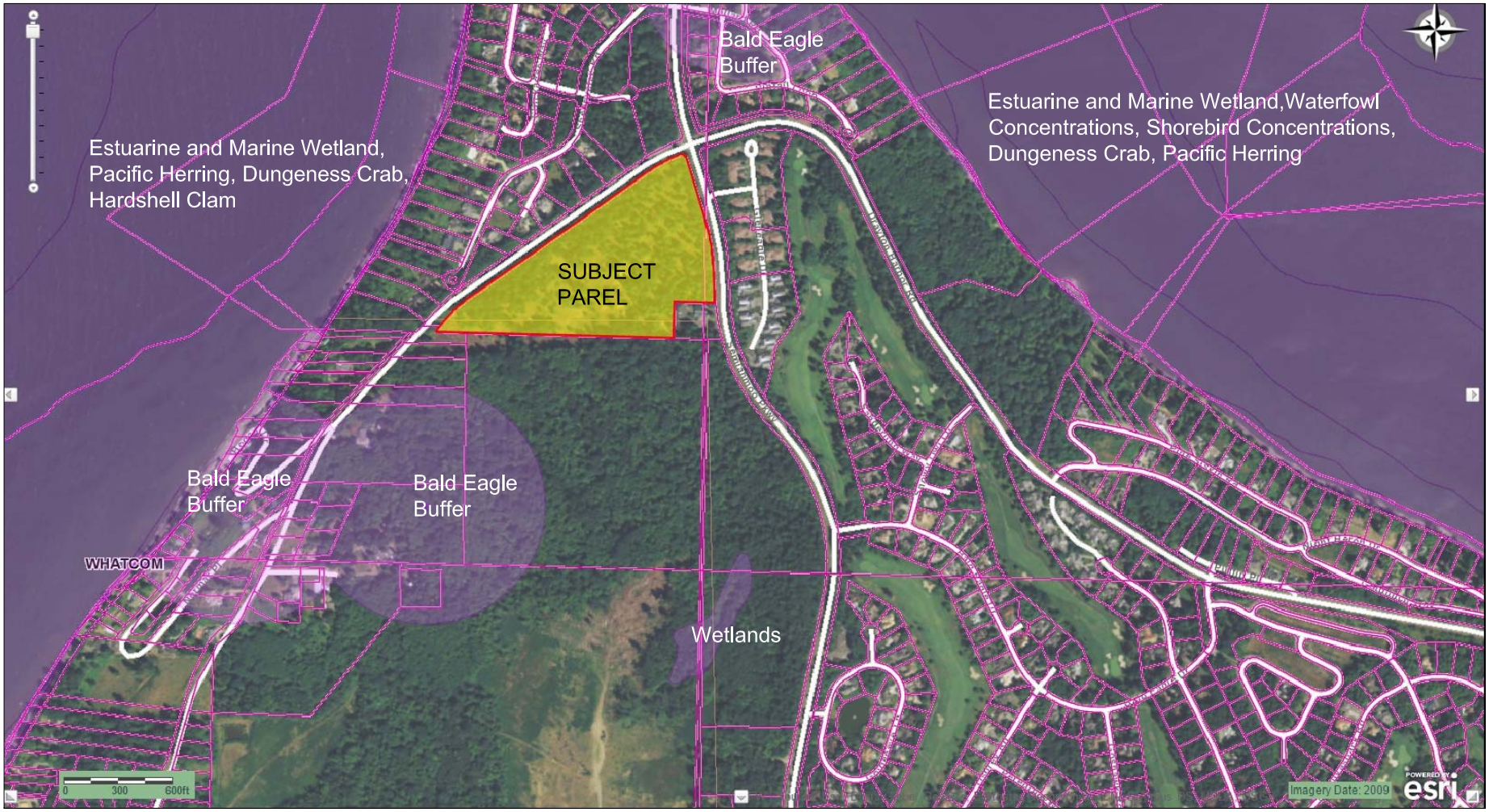

Figure 2. WDFW Priority Habitats and Species Map
Resort Semiahmoo Zone 3
Parcel 405110 510169

0 2,000'

April 29, 2016

Cantrell & Associates, Inc.

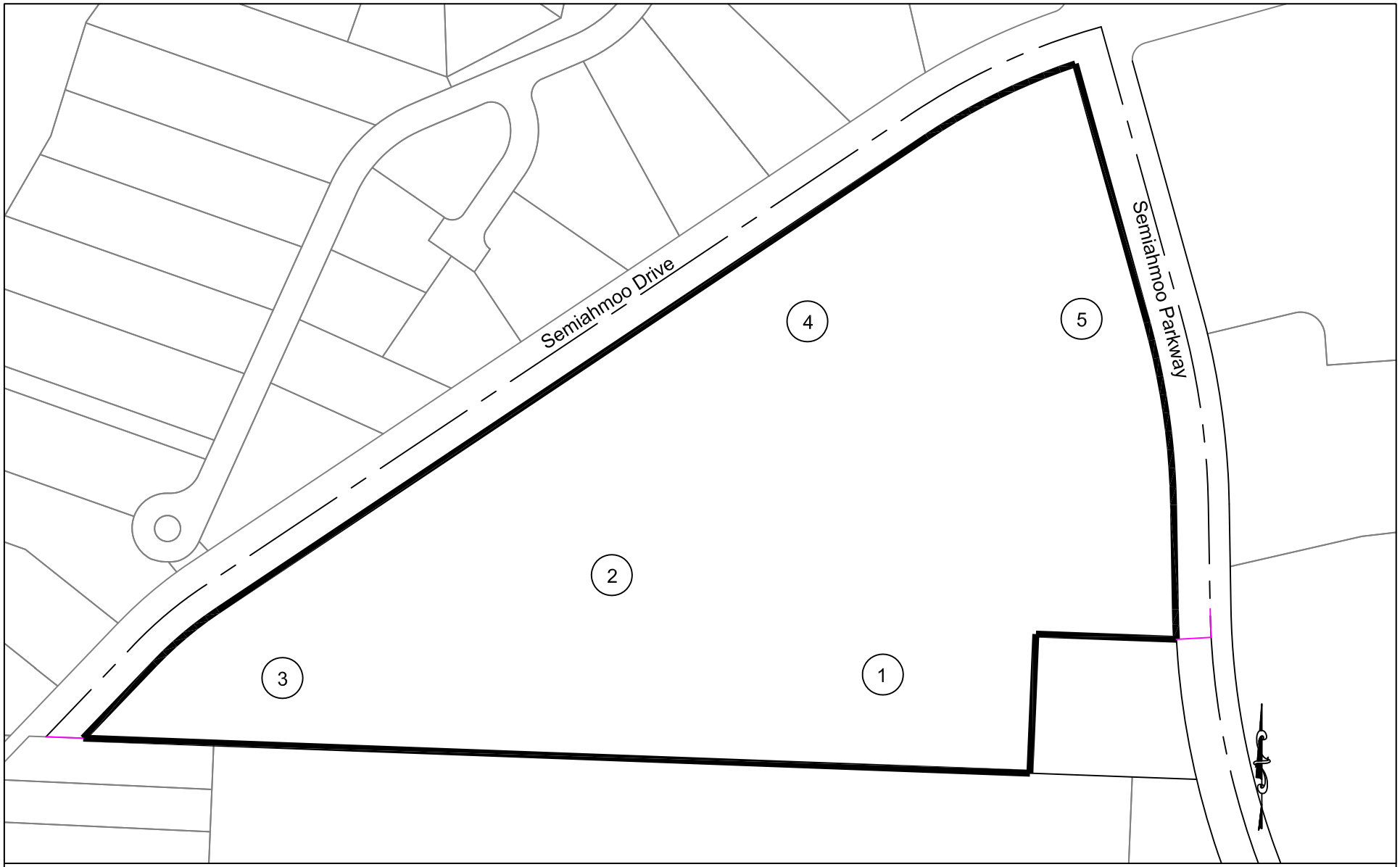

Figure 3. Wetland Determination Map
Resort Semiahmoo Zone 3
Parcel 405110 510169

(#) Data Plot Location

0 200'

April 29, 2016

Cantrell & Associates, Inc.

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Resort Semiahmoo Zone 3	Sampling Date:	4/20/2016
Applicant/Owner:	M:KOV Inc.	Sampling Point:	1
Investigator:	Bill Cantrell	City/County:	Blaine, Whatcom
Section, Township, Range:	S02 T40N, R01W	State:	WA
Landform (hillslope, terrace, etc) Terrace	Slope (2%)	Local relief (concave, convex, none)	
Subregion (LRR)	Lat	Long	Datum
Soil Map Unit Name: (51) Everett complex, 2-8% slopes		NWI classification: Upland	

Are climatic/hydrologic conditions on the site typical for this time of year? [x] Yes [ ] No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? [x] Yes [ ] No
Are Vegetation, Soil or Hydrology significantly disturbed? No
Are Vegetation, Soil or Hydrology naturally problematic? No (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	[X] No	**Is this Sampling Point within a Wetland?**	[ ] Yes [X] No
Hydric Soils Present?	[ ] Yes	[X] No		
Wetland Hydrology Present?	[ ] Yes	[X] No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size _____)	Absolute % Cover	Dominant Species?	Indicator Status
Pseudotsuga menziesii	60	Y	FACU
Thuja plicata	30	Y	FAC
Acer macrophyllum	10	N	FACU
	100	= Total Cover	
Sapling/Shrub Stratum *(Plot size _____)*			
Symphoricarpos albus	20	Y	FACU
	20	= Total Cover	
Herb Stratum *(Plot size)*			
Polystichum munitum	40	Y	FACU
Trientalis borealis	20	Y	FACW
Urtica dioica	20	Y	FAC
Mahonia nervosa	20	Y	FACU
	100	= Total Cover	
Woody Vine Stratum *(Plot size)*			
		= 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:	7	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	43%	(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

No	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? No

Remarks:

SOIL **Sampling Point 1**

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 %	Type[1]	Loc[2]	Texture	Remarks
0-5”	10YR 2/2						Loam	
5-16”	7.5YR 3/4						Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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 X

Remarks: High chroma soils.

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 (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ 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 & 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

Field Observations

Surface Water Present?	☐	Yes	X	No	Depth (in):
Water Table Present?	☐	Yes	X	No	Depth (in):
Saturation Present? (includes capillary fringe)	☐	Yes	X	No	Depth (in):

Wetland Hydrology Present? Yes ☐ No X

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

Remarks: No signs of wetland hydrology.

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Resort Semiahmoo Zone 3	Sampling Date:	4/20/2016
Applicant/Owner:	M:KOV Inc.	Sampling Point:	2
Investigator:	Bill Cantrell	City/County:	Blaine, Whatcom
Section, Township, Range:	S02 T40N, R01W	State:	WA
Landform (hillslope, terrace, etc) Terrace	Slope (2%)	Local relief (concave, convex, none)	
Subregion (LRR)	Lat	Long	Datum
Soil Map Unit Name: (51) Everett complex, 2-8% slopes		NWI classification: Upland	

Are climatic/hydrologic conditions on the site typical for this time of year? [x] Yes [ ] No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? [x] Yes [ ] No
Are Vegetation, Soil or Hydrology significantly disturbed? No
Are Vegetation, Soil or Hydrology naturally problematic? No (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	[X] No	**Is this Sampling Point within a Wetland?**	[ ] Yes [X] No
Hydric Soils Present?	[ ] Yes	[X] No		
Wetland Hydrology Present?	[ ] Yes	[X] No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size _____)	Absolute % Cover	Dominant Species?	Indicator Status
Pseudotsuga menziesii	40	Y	FACU
Thuja plicata	40	Y	FAC
	80	= Total Cover	
Sapling/Shrub Stratum *(Plot size _____)*			
		= Total Cover	
Herb Stratum *(Plot size)*			
Polystichum munitum	20	Y	FACU
Hypochaeris radicata	20	Y	FACU
Urtica dioica	20	Y	FAC
Cirsium vulgare	10	N	FACU
Rubus ursinus	20	Y	FACU
Agropyron repens	20	Y	FAC
	110	= Total Cover	
Woody Vine Stratum *(Plot size)*			
		= 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:	7	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	43%	(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

No	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? No

Remarks:

SOIL **Sampling Point 2**

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4”	10YR 2/2						Loam	
4-16”	10YR 3/3						Gravelly loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- [ ] 2cm Muck (A10)
- [ ] Red Parent Material (TF2)
- [ ] 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 [X]

Remarks: High chroma soils.

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 (**except MLRA 1, 2, 4A & 4B**) (B9)
- [ ] 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 & 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

Field Observations

Surface Water Present?	[ ]	Yes	[X]	No	Depth (in):
Water Table Present?	[ ]	Yes	[X]	No	Depth (in):
Saturation Present? (includes capillary fringe)	[ ]	Yes	[X]	No	Depth (in):

Wetland Hydrology Present? Yes [ ] No [X]

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

Remarks: No signs of wetland hydrology.

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the
1987 COE Wetlands Delineation Manual

Project Site:	Resort Semiahmoo Zone 3	Sampling Date:	4/20/2016
Applicant/Owner:	M:KOV Inc.	Sampling Point:	3
Investigator:	Bill Cantrell	City/County:	Blaine, Whatcom
Section, Township, Range:	S02 T40N, R01W	State:	WA

Landform (hillslope, terrace, etc) Terrace — Slope (2%) — Local relief (concave, convex, none)

Subregion (LRR) — Lat — Long — Datum

Soil Map Unit Name: (48) Everett gravelly sandy loam, 2-8% slopes — NWI classification: Upland

Are climatic/hydrologic conditions on the site typical for this time of year?	x	Yes		No	(If no, explain in remarks.)
Are "Normal Circumstances" present on the site?	x	Yes		No	
Are Vegetation, Soil or Hydrology significantly disturbed? No					
Are Vegetation, Soil or Hydrology naturally problematic? No					(If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	X	Yes		No	**Is this Sampling Point within a Wetland?**		Yes	X	No
Hydric Soils Present?		Yes	X	No					
Wetland Hydrology Present?		Yes	X	No					

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size _____)	Absolute % Cover	Dominant Species?	Indicator Status
Alnus rubra	20	Y	FAC
Thuja plicata	30	Y	FAC
	50	= Total Cover	
Sapling/Shrub Stratum *(Plot size _____)*			
Rubus spectabilis	40	Y	FAC
Rubus parviflorus	20	Y	FAC
	60	= Total Cover	
Herb Stratum *(Plot size)*			
Urtica dioica	50	Y	FAC
Tolmiea menziesii	20	Y	FAC
Polystichum munitum	10	N	FACU
	80	= Total Cover	
Woody Vine Stratum *(Plot size)*			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	6	(A)
Total Number of Dominant Species Across All Strata:	6	(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		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

Yes	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes

Remarks:

SOIL

Sampling Point 3

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 %	Type[1]	Loc[2]	Texture	Remarks
0-12”	10YR 2/2						Gravelly loam	
12-16”	10YR 3/2.5						Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- [ ] 2cm Muck (A10)
- [ ] Red Parent Material (TF2)
- [ ] 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 [X]

Remarks: No redox features.

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 (**except MLRA 1, 2, 4A & 4B**) (B9)
- [ ] 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 & 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

Field Observations

Surface Water Present?	[ ] Yes	[X] No	Depth (in):	
Water Table Present?	[ ] Yes	[X] No	Depth (in):	
Saturation Present? (includes capillary fringe)	[ ] Yes	[X] No	Depth (in):	

Wetland Hydrology Present? Yes [ ] No [X]

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

Remarks: No signs of wetland hydrology.

WETLAND DETERMINATION DATA FORM
Western Mountains, Valleys, and Coast Supplement to the
1987 COE Wetlands Delineation Manual

Project Site:	Resort Semiahmoo Zone 3	Sampling Date:	4/20/2016
Applicant/Owner:	M:KOV Inc.	Sampling Point:	4
Investigator:	Bill Cantrell	City/County:	Blaine, Whatcom
Section, Township, Range:	S02 T40N, R01W	State:	WA
Landform (hillslope, terrace, etc) Terrace	Slope (2%)	Local relief (concave, convex, none)	
Subregion (LRR)	Lat	Long	Datum
Soil Map Unit Name: (51) Everett complex, 2-8% slopes		NWI classification: Upland	

Are climatic/hydrologic conditions on the site typical for this time of year? [x] Yes [ ] No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? [x] Yes [ ] No
Are Vegetation, Soil or Hydrology significantly disturbed? No
Are Vegetation, Soil or Hydrology naturally problematic? No (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	[X] No	**Is this Sampling Point within a Wetland?** [ ] Yes [X] No
Hydric Soils Present?	[ ] Yes	[X] No	
Wetland Hydrology Present?	[ ] Yes	[X] No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size _____)	Absolute % Cover	Dominant Species?	Indicator Status
Pseudotsuga menziesii	50	Y	FACU
Thuja plicata	20	Y	FAC
	70	= Total Cover	
Sapling/Shrub Stratum *(Plot size _____)*			
Acer circinatum	10	Y	FAC
Symphoricarpos albus	5	Y	FACU
	15	= Total Cover	
Herb Stratum *(Plot size)*			
Polystichum munitum	50	Y	FACU
Carex deweyana	5	N	FACU
Urtica dioica	20	Y	FAC
	75	= Total Cover	
Woody Vine Stratum *(Plot size)*			
		= 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:	6	(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		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

No	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? No

Remarks:

SOIL

Sampling Point 4

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4”	10YR 2/2						Sandy loam	
4-16”	10YR 3/3						Gravelly sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- [ ] 2cm Muck (A10)
- [ ] Red Parent Material (TF2)
- [ ] 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 [X]

Remarks: High chroma soils. No redox features

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 (**except MLRA 1, 2, 4A & 4B**) (B9)
- [ ] 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 & 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

Field Observations

Surface Water Present?	[ ] Yes	[X] No	Depth (in):
Water Table Present?	[ ] Yes	[X] No	Depth (in):
Saturation Present? (includes capillary fringe)	[ ] Yes	[X] No	Depth (in):

Wetland Hydrology Present? Yes [ ] No [X]

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

Remarks: No signs of wetland hydrology.

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Resort Semiahmoo Zone 3	Sampling Date:	4/20/2016
Applicant/Owner:	M:KOV Inc.	Sampling Point:	5
Investigator:	Bill Cantrell	City/County:	Blaine, Whatcom
Section, Township, Range:	S02 T40N, R01W	State:	WA
Landform (hillslope, terrace, etc) Terrace	Slope (2%)	Local relief (concave, convex, none)	
Subregion (LRR)	Lat	Long	Datum
Soil Map Unit Name: (51) Everett complex, 2-8% slopes		NWI classification: Upland	

Are climatic/hydrologic conditions on the site typical for this time of year? [x] Yes [ ] No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? [x] Yes [ ] No
Are Vegetation, Soil or Hydrology significantly disturbed? No
Are Vegetation, Soil or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	[X] Yes	[ ] No	**Is this Sampling Point within a Wetland?**	[ ] Yes	[X] No
Hydric Soils Present?	[ ] Yes	[X] No			
Wetland Hydrology Present?	[ ] Yes	[X] No			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size _____)	Absolute % Cover	Dominant Species?	Indicator Status
Thuja plicata	40	Y	FAC
Acer macrophyllum	20	Y	FACU
Alnus rubra	20	Y	FAC
Pseudotsuga menziesii	10	N	FACU
	90	= Total Cover	
Sapling/Shrub Stratum *(Plot size _____)*			
Rubus parviflorus	20	Y	FAC
Acer circinatum	15	Y	FAC
	35	= Total Cover	
Herb Stratum *(Plot size)*			
Claytonia perfoliata	30	Y	FAC
Polystichum munitum	20	Y	FACU
Urtica dioica	20	Y	FAC
Rubus ursinus	20	Y	FACU
Cirsium vulgare	10	N	FACU
	100	= Total Cover	
Woody Vine Stratum *(Plot size)*			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	6	(A)
Total Number of Dominant Species Across All Strata:	9	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	67%	(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

Yes	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes

Remarks:

SOIL **Sampling Point 5**

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 %	Type[1]	Loc[2]	Texture	Remarks
0-1”	10YR 2/2						Sandy loam	
1-16”	10YR 3/3						Gravelly sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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 X

Remarks: High chroma soils, no redox features

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 (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ 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 & 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

Field Observations

Surface Water Present?	☐	Yes	X	No	Depth (in):
Water Table Present?	☐	Yes	X	No	Depth (in):
Saturation Present? (includes capillary fringe)	☐	Yes	X	No	Depth (in):

Wetland Hydrology Present? Yes ☐ No X

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

Remarks: No signs of wetland hydrology.

Critical Areas Assessment Report:
Trillium Corporation-Semiahmoo Zone 3 Parcel
City of Blaine, Washington

February 2009

Prepared for:

Trillium Corporation
1329 North State Street
Suite 210
Bellingham, Washington
360-676-9400

Prepared by:

Aqua-Terr Systems, Inc.
21993 Grip Road
Sedro-Woolley, Washington 98284

ATSI
Aqua-Terr Systems, Inc.

Critical Areas Assessment Report:
Trillium Corporation-Semiahmoo Zone 3 Parcel
City of Blaine, Washington

February 2009

Prepared for:

Trillium Corporation
1329 North State Street
Suite 210
Bellingham, Washington
360-676-9400

Prepared by:

Jim Wiggins, MS, PWS
President

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Figure 1. Vicinity map and the approximate location of the parcel.

Figure 2. Aerial photograph and the approximate locations of the parcel and Sample Plots.

Figure 3. National Wetlands Inventory map and the approximate locations of the parcel and wetlands in the area.

Figure 4. Natural Resources Conservation Service soil survey map and the approximate locations of the parcel and soils in the area.

APPENDIX

Appendix A. Figures
Appendix B. Data sheets

EXECUTIVE SUMMARY

Aqua-Terr Systems, Inc. (ATSI) has been retained by Trillium Corporation to prepare a critical areas assessment report for an approximate 15 acre parcel. The parcel is situated west of Semiahmoo Parkway and south of Semiahmoo Drive in the City of Blaine, Washington within a portion of Sections 10 and 11, Township 40 north, Range 1 west, Willamette Meridian (WM). The purpose of the critical areas assessment report is to document the presence of critical areas, which include wetlands, streams, and fish and wildlife habitat, and their regulated buffers that are located on and/or adjacent to the parcel.

The triangular shaped parcel is bounded by Semiahmoo Drive to the northwest, Semiahmoo Parkway to the east, and forested land to the south. The topography of the parcel is relatively flat and generally slopes slightly northwest with minor pit and mound/ridge and swale features. The majority of the surrounding land use is comprised of residential, recreational and openspace. The parcel is forested upland with deciduous and coniferous tree species which have an understory of scrub/shrub and herbaceous plant communities. No regulated critical areas were observed on the parcel.

INTRODUCTION

As requested, ATSI reviewed the approximate 15 acre Trillium Corporation parcel situated west of Semiahmoo Parkway and south of Semiahmoo Drive in the City of Blaine, Washington (Appendix A; Figures 1 and 2). The purpose of this report is to assess the presence, location, and extent of regulated critical areas and their regulated buffers under the jurisdiction of local (City of Blaine), state (Washington State Department of Ecology (Ecology)), and federal (United States (US) Army Corps of Engineers (Corps)) governments. Regulated critical areas were not observed on the parcel.

METHODS AND PROCEDURES

Regulations

The wetlands referred to in this report follow the Corps definition: "*...those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions* (Environmental Laboratory 1987)" and the State of Washington, *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997). Through Section 404 of the Clean Water Act, the Corps has the authority to regulate the placement of fill materials in wetlands and other waters of the US and requires permits for such activities. The City of Blaine regulates all activities in and around wetlands through Blaine Municipal Code, Chapter 17.83-Wetland Management (City of Blaine 2000).

Field Reconnaissance and Personnel

A two-step procedure is used to determine the presence and extent of critical areas that are located on and/or adjacent to the parcel. This procedure includes preliminary data

review and on-site reconnaissance in which qualitative analyses of biota and habitats are performed. The goal of this analysis and site review is to describe the biological aspects of the parcel in order to provide sufficient information for the client and regulating agencies to make informed decisions regarding critical areas.

A preliminary review of public resource documents is used to provide initial information on vegetation, soil, hydrology, and critical areas located on and/or adjacent to the parcel. These resources include, but are not limited to:

- United States Department of Agriculture, Natural Resource Conservation Service (USDA, NRCS) soil survey maps.
- NRCS hydric soil lists.
- National Wetland Inventory (NWI) maps.
- Local jurisdiction inventory maps.

During our on-site reconnaissance, we observe the general terrain, traverse the parcel, and make visual observations of adjacent parcels to identify critical areas. Aerial photographs, soil data, and topographic maps are used for orientation and to assist in locating critical areas. Data is also collected on the vegetation, soil, and hydrology and recorded on data forms (Appendix B).

An on-site field reconnaissance was conducted on 20 January 2009 by Jim Wiggins MS, PWS and ATSI associate biologist, Karla Van Leaven, BS. Mr. Wiggins is a Professional Wetland Scientist (PWS) certified through the Society of Wetland Scientists, Professional Certification Program. Both Mr. Wiggins and Ms. Van Leaven have completed the two-day training for Ecology's wetland rating system.

Wetland Identification and Evaluation

All wetlands are identified based on the presence of hydrophytic vegetation, hydric soil, and wetland hydrology as described in the Corps, *Wetland Delineation Manual* (Environmental Laboratory 1987) and *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Corps 2008) and the State of Washington, *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997). All three parameters must be present for an area to be considered a jurisdictional wetland under normal circumstances. Atypical situations and problem areas are treated per the Corps and state manuals. The before-mentioned information is recorded on data forms (Appendix B).

Vegetation

An area has hydrophytic vegetation when greater than 50 percent of the total composition of the dominant plant species from all stratums have an indicator status of Facultative (FAC), Facultative Wetland (FACW), or Obligate Wetland (OBL) (Environmental Laboratory 1987) as defined in the *National List of Plant Species that*

Occur in Wetlands: 1988 Northwest (Reed 1988) and the *1993 Supplement to List of Plant Species that Occur in Wetlands: Northwest (Region 9)* (Reed 1993).

Additional indicator statuses of Facultative Upland (FACU) and Obligate Upland (UPL) are given to plants that usually occur in non-wetlands or nearly always occur in non-wetlands respectively. No Indicator (NI) is given to those species that lack sufficient indicator status information and No Occurrence (NO) is given to those species in which there was no known occurrence in the region at the time that the list was compiled (Reed 1988). Furthermore, we record those species that were not included in the National List or its supplement as Not Listed (NL).

The percent cover of the dominant plant species is estimated and the indicator status of each species is determined for each stratum (e.g. tree, woody vine, sapling/shrub, and herb stratums) within a 30 foot radius plot for the tree and woody vine stratums and a 5 foot radius plot for the sapling/shrub and herb stratums. Plot size and shape are modified to reflect site conditions and deviations from the manual are recorded on the data forms (Appendix B).

Soil

Hydric soils, in general, are those soils that have high organic-matter, sulfidic material, reduced conditions, aquic or peraquic moisture regimes, soil colors with a chroma of one, soil colors with a chroma of two with redoxymorphic features (e.g. concentrations and depletions, formerly known as mottles), or the presence of iron or manganese soft masses or pore linings (Environmental Laboratory 1987).

On-site soils are described from a 20 inch (+/-) hand-dug soil pit. Hydric soil characteristics and indicators, such as redoxymorphic features, are examined within the soil profile. Soil color, texture, and hydric indicators, if present, are recorded on the data forms (Appendix B). Color is determined using Munsell Soil Color Charts (Kollmorgen 1998).

Hydrology

Wetland hydrology is present when direct or indirect indicators of seasonal or permanent soil saturation or inundation are observed. Primary indicators include a high water table, soil saturation, water marks, sediment deposits, iron deposits, soil surface cracks, inundation visible on aerial imagery, sparsely vegetated concave surfaces, water stained leaves, salt crust, aquatic invertebrates, hydrogen sulfide odor, oxidized rhizospheres along living roots, presence of reduced iron, recent iron reduction in tilled soils, and stunted or stressed plants. Secondary indicators include water stained leaves, drainage patterns, dry season water table, saturation visible on aerial imagery, geomorphic position, shallow Aquitard, passing the FAC Neutral test, raised ant mounds, and frost heave hummocks.

Categorizing Wetlands
In order to categorize wetlands we use the system of the local jurisdiction or Ecology's revised *Washington State Wetland Rating System for Western Washington* (Hruby 2004) if the local jurisdiction lacks a categorization system. Ecology's system takes into account the hydrogeomorphic class of the wetland, sensitivity to disturbance, significance of the wetland, its degree of rarity, replacement potential, and functions the wetland provides.

Evaluating Wetland Functions
We evaluate wetland functions with the *Methods for Assessing Wetland Functions Volume I: Riverine and Depressional Wetlands in the Lowlands of Western Washington* (Hruby et al. 1999). When this method is not applicable (e.g. slope, lacustrine fringe, flats wetlands, wetlands outside of the lowlands, or wetlands too small for this method) we use an evaluation method that we derived from a combination of best professional judgment, the wetland functions listed in Ecology's *Washington State Wetland Rating System for Western Washington* (Hruby 2004), and several other wetland functional assessment methods. This assessment provides information that aids in categorization of the wetlands and baseline information if mitigation is required. Below is a list of functions addressed; a similar list of functions is used to assess other critical areas:

1. Size.
2. Presence and number of habitat features.
3. Uniqueness to area or in general.
4. Age and classes of communities and populations.
5. Buffer size and character.
6. Ecotone complexity and transition zone between dry land and watercourses (sinuosity).
7. Water quality.
8. Flood and storm drainage protection.
9. Groundwater discharge/recharge.
10. Shoreline stabilization.
11. Habitat for fish and/or wildlife.
12. Presence of sensitive, threatened, or endangered species.
13. Wildlife corridors and linkage to other habitats.
14. Cultural, heritage, recreational, and local value.
15. Enhancement potential.

EXISTING CONDITIONS

General

The approximate 15 acre parcel is situated west of Semiahmoo Parkway and southeast of Semiahmoo Drive in the City of Blaine, Washington within a portion of Sections 10 and 11, Township 40 north, Range 1 west, WM (Figures 1 and 2). The triangular shaped parcel is bounded by Semiahmoo Drive to the northwest, Semiahmoo Parkway to the east, and forested land to the south. The topography of the parcel is relatively flat and generally slopes slightly northwest with minor pit and mound/ridge and swale

features. The general surrounding land use is comprised of residential single family housing developments and gated communities and a recreational golf course.

The parcel is forested upland with deciduous and coniferous tree species which have an understory of scrub/shrub and herbaceous plant communities. There are several pieces of large woody debris in the form of logs and snags located throughout the parcel. Two wet areas (not regulated wetlands but need to be described) were observed on the northwest portion of the parcel.

The most western wet area is about 5,000 square feet in size. A portion of the wet area was experiencing sheetflow over the forest floor while saturation and the water table were present within the remainder of the area. Vegetation within this wet area was comprised of FAC/FACU plant species. The second wet area was located within a 3 foot depression about 5 feet in diameter. About 80 percent of the depression was ponded and there was no vegetation present. It is likely that both wet areas are a result of recent heavy rains and snowmelt. Because of their lack of hydric soil and dominance of FAC/FACU plants, they are not considered regulated wetlands.

City of Blaine Wetlands and Streams Map
The City of Blaine does not map wetlands on or adjacent to the parcel (City of Blaine 2004). We concur with this assessment. Wetlands were not observed on the parcel or within the general vicinity.

National Wetlands Inventory Map
The NWI map does not depict wetlands on or adjacent to the parcel (Figure 3). We did not observe wetlands on the parcel and therefore concur with the mapping.

Vegetation
The majority of the parcel is forested upland with an understory of scrub/shrub and herbaceous plant communities.

Field Observations
Upland Forest
The dominant species present within the tree stratum of the parcel include bigleaf maple (*Acer macrophyllum*; FACU), red alder (*Alnus rubra*; FAC), and Douglas fir (*Pseudotsuga menziesii*; FACU); within the sapling/shrub stratum include snowberry (*Symphoricarpos albus*; FACU) and vine maple (*Acer circinatum*; FAC-); and within the herbaceous stratum include sword fern (*Polystichum munitum*; FACU).

The subdominant species present within the tree stratum of the parcel include western redcedar (*Thuja plicata*; FAC), western redcedar reproduction, grand fir (*Abies grandis*; FACU), vine maple (*Acer circinatum*; FAC-), and paper birch (*Betula papyrifera*; FAC); within the sapling/shrub stratum include salmonberry (*Rubus spectabilis*; FAC), Osoberry (*Oemleria cerasiformis*; FACU), oceanspray (*Holodiscus discolor*; NI), Oregon

grape (*Mahonia nervosa*; FACU), and holly sp. (*Ilex* sp.; NL); and within the herbaceous stratum include trailing blackberry (*Rubus ursinus*; FACU), stinging nettle (*Urtica diocia*; FAC), lady fern (*Althyrium filix-femina*; FAC), and bracken fern (*Pteridium aquilinum*; FACU).

The vegetation sampled did not satisfy the hydrophytic vegetation indicators.

Soil

Natural Resources Conservation Service Soil Description

The NRCS maps two soil units on the parcel: 48-Everett gravelly sandy loam, hard substratum, 2 to 8 percent slopes and 51 Everett complex, 2 to 8 percent slopes (NRCS 2008; Figure 4). The Everett soil units are listed as non-hydric (NRCS 2001). The soils observed on the parcel resembled the Everett soil units.

Excerpts from the NRCS soil description (Goldin 1992) for the Everett soil units are listed below:

> **Everett gravelly sandy loam, hard substratum, 2 to 8 percent slopes (48) -** This deep, somewhat excessively drained soil is on outwash terraces and moraines. It formed in a mixture of volcanic ash and alluvium over glacial outwash and glacial till. The native vegetation is mainly conifers and shrubs. Elevation is 100 to 500 feet. The average annual precipitation is about 40 inches, the average annual air temperature is about 50 degrees Fahrenheit, and the average frost-free period is about 180 days.
>
> This unit is 50 percent Everett very gravelly sandy loam and 35 percent Everett gravelly sandy loam. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the selected scale.
>
> Typically, the surface is covered with a mat of undecomposed needles and twigs 2 inches thick. The surface layer, when mixed to a depth of 6 inches, is dark yellowish brown gravelly sandy loam. The upper 7 inches of the subsoil is dark brown gravelly sandy loam. The lower 12 inches is strong brown very gravelly sandy loam. The substratum is dark brown very gravelly loamy sand 16 inches thick. Dense glacial till that crushes to very gravelly loamy sand is at a depth of 41 inches. The depth to very gravelly loamy sand ranges from 14 to 30 inches. Depth to dense glacial till or dense glaciomarine deposits range from 40 to 60 inches. The dense glacial till is similar to a cemented pan.
>
> In some areas the surface layer is very gravelly sandy loam or very gravelly loam. In some areas this soil has 15 to 35 percent rock fragments in the subsoil, has very gravelly sandy loam upper substratum, has the dense glacial till below 60 inches, or has the dense glacial till weakly cemented.
>
> Included in this unit are small areas of Birchbay, Clipper, Labounty, and Squalicum soils and small areas of Everett soils that have a stony surface, have

a surface layer of very gravelly sand, or have slopes of more than 8 percent or less than 2 percent. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the upper part of this Everett soil, rapid and very rapid in the substratum, and very slow in the dense glacial till. Available water capacity is low. The effective rooting depth is limited by a seasonally high water table, which is at 3.5 to 5.0 feet from December through April. Runoff is slow and the hazard of water erosion is slight.

The depth of the dense glacial till or dense glaciomarine deposits ranges from 40 to 60 inches. The dense glacial till is similar to a cemented pan. In some areas the surface layer is very gravelly sandy loam or very sandy loam in the upper part of the substratum or has weakly cemented glacial till or glaciomarine deposits.

Everett complex, 2 to 8 percent slopes (51) - This map unit is on outwash terraces and moraines. It formed in a mixture of volcanic ash and alluvium over glacial outwash and glacial till. The native vegetation is mainly conifers and shrubs. Elevation is 100 to 500 feet. The average annual precipitation is about 40 inches, the average annual air temperature is about 50 degrees Fahrenheit, and the average frost-free period is about 180 days.

This unit is 50 percent Everett very gravelly sandy loam and 35 percent Everett gravelly sandy loam. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the selected scale.

Included in this unit are small areas of Birchbay, Clipper, Labounty, and Squalicum soils and small areas of Everett soils that have a stony surface, have a surface layer of very gravelly sand, or have slopes of more than 8 percent or less than 2 percent. Also included are soils that are similar to the Everett soil but have 15 to 35 percent rock fragments in the subsoil or have a substratum of very gravelly sandy loam. Included areas make up about 15 percent of the total acreage.

Everett very gravelly sandy loam is very deep and somewhat excessively drained. Typically, the surface is covered with a mat of undecomposed needles, twigs, and rotting wood 4 inches thick. When mixed to a depth of 6 inches, the surface layer is dark brown very gravelly sandy loam. The subsoil is dark brown very gravelly sandy loam 12 inches thick. The substratum to a depth of 60 inches is variegated very gravelly sand. The depth to very gravelly sand ranges from 14 to 24 inches.

Permeability is rapid in the upper part of this Everett soil and very rapid in the lower part. Available water capacity is low. The effective rooting depth is 60 inches. Runoff is slow and the hazard of water erosion is slight.

Everett gravelly sandy loam is deep and well drained. Typically, the surface is covered with a mat of undecomposed needles and twigs 2 inches thick. When mixed to a depth of 6 inches, the surface layer is dark yellowish brown gravelly sandy loam. The upper 7 inches of the subsoil is dark brown gravelly sandy loam. The lower 12 inches is strong brown very gravelly sandy loam. The substratum is dark brown very gravelly loamy sand 16 inches thick. Dense glacial till that crushes to very gravelly loamy sand is at a depth of 41 inches. The depth to very gravelly loamy sand ranges from 14 to 30 inches. The depth to the dense glacial till or dense glaciomarine deposits ranges from 40 to 60 inches. The dense glacial till is similar to a cemented pan. In some areas the surface layer is very gravelly sandy loam or very sandy loam in the upper part of the substratum, or has weakly cemented glacial till or glaciomarine deposits.

Permeability is moderate in the upper part of this Everett soil, rapid in the next part, and very slow in the dense glacial till. Available water capacity is low. The effective rooting depth is limited by a seasonally high water table, which is at a depth of 3.5 to 5.0 feet from December through April. Runoff is low and the hazard of water erosion is slight.

Field Observations

The soils sampled had between two and three layers. The depth of the first layer ranged from 1 to 13 inches and was either very dark brown (10YR 2/2) or black (10YR 2/1) duffy loam, sandy loam, or duffy sandy loam. The depth of the second layer ranged from 11 to 20 inches and was at or between dark grey (10YR 4/1) and very dark grayish brown (10YR 3/2) sandy loam, loamy sand, sandy gravelly loam, or loamy gravelly sand. The third layer, down to a depth of 20 inches, ranged from dark yellowish brown (10YR 4/4) to dark brown (10YR 3/3) loamy sandy gravel or loamy gravelly sand.

The soils sampled did not satisfy the hydric soil indicators.

Hydrology

The primary source of hydrology to the parcel is from precipitation, a seasonally high water table, and upgradient runoff.

Field Observations

Hydrology was observed in two wet areas on the western portion of the parcel. About 0.5 to 1.0 inch of water was flowing towards the northeast portion of the most western wet area. The remaining portion had saturation to the surface and the water table was present at 1 inch. There is evidence that during high water events the wet area flows off of the parcel and into a ditch adjacent to the southern portion of Semiahmoo Drive.

The second wet area had about 2 feet of ponded water present.

We believe that the hydrology observed in both wet areas was a result of snowmelt and heavy rains in the weeks prior to our site visit. The soils were saturated with water and

therefore the groundwater level was higher than normal. We do not believe that the wet areas experience hydrology long enough to have wetland hydrology.

The hydrology observed did not satisfy the wetland hydrology indicators.

Wetland Categorization and Function Evaluation
We did not observe wetlands and therefore, categorization and function evaluation were not completed.

Habitat, Fish, and Wildlife
The habitat present on the parcel is undisturbed upland. The parcel is forested with an understory of scrub/shrub and herbaceous plant communities. There are several pieces of large woody debris located throughout the parcel. Wildlife that may use these habitats includes insects, amphibians, reptiles, birds, and small and large mammals. The habitat is not suitable for fish, waterfowl, or aquatic insects. There was evidence of deer (*Odocoileus* sp.), deer droppings, and pileated woodpecker (*Dryocopus pileatus*), foraging snags, located throughout the parcel. The undisturbed connection to the forested land to the south increases the potential for wildlife to migrate onto and through the parcel. The significant boundaries that may decrease access onto and through the parcel are Semiahmoo Parkway to the east and Semiahmoo Drive to the northwest (Figure 2).

The pileated woodpecker is a Species Of Concern in Washington State where it is listed as a State Candidate species in which the Washington Department of Fish and Wildlife (WDFW) lists it as a priority species in its priority breeding area (WDFW 2008). We saw evidence of pileated woodpecker foraging areas and therefore, management recommendations do not apply. We did not observe other state or federally listed species or priority habitats/species on the parcel. As per the Washington Natural Heritage Program (WNHP), there are no Natural Heritage Features associated with wetlands on the parcel (WNHP 2007).

DETERMINATIONS
We documented two wet areas that are not wetlands and therefore are not regulated by the City of Blaine and do not have a recommended buffer widths (City of Blaine 2000). No other critical areas were observed on the parcel.

Federal and State Regulations
The Corps requires notification of all disturbances to all wetlands, streams, and other waters and it is incumbent upon the landowner to disclose such disturbances. Isolated wetlands are not under the jurisdiction of the Corps, but the Corps must confirm isolated wetland status. Ecology and the Environmental Protection Agency require a 401 water quality certification for disturbance to wetlands depending upon the type of project and for disturbance to wetlands 0.5 acres (21,780 square feet) or greater.

Ecology regulates all isolated wetlands (Revised Code of Washington 90.48) as well. Any disturbance of a wetland area 0.5 acres or greater, or within a 100 year floodplain requires an Individual Permit from the Corps which includes the requirement of compensatory mitigation and an alternatives analysis. The Corps also has the discretion not to allow disturbance to high quality wetlands. Both Ecology and the Corps require certification that no listed, endangered, threatened, or sensitive plant or animal species, or National Historic Places are present on the parcel.

LIMITATIONS

We have used the most current, established methods to make determinations as to the location, size, and types of critical areas located on the parcel. All of the above statements are based on our best professional judgment. Although we follow the local, state, and federal criteria, we cannot guarantee that the Corps or the local jurisdiction determination will correspond to ours. Please note that regulations pertaining to critical areas are subject to change over time.

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APPENDICES

Appendix A: Figures

Trillium-Semiahmoo Zone 3, City of Blaine, Washington

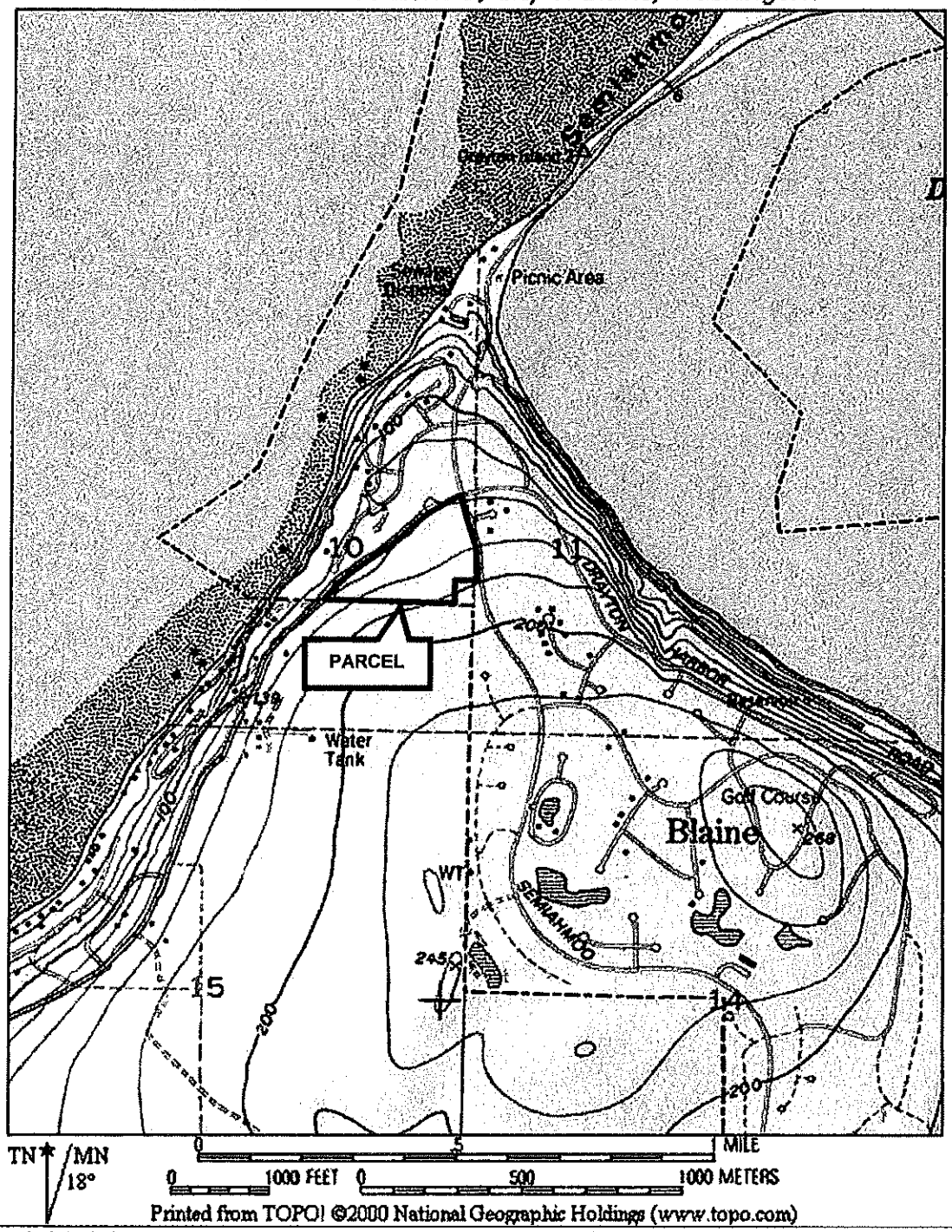

Figure 1. Vicinity map and the approximate location of the parcel.

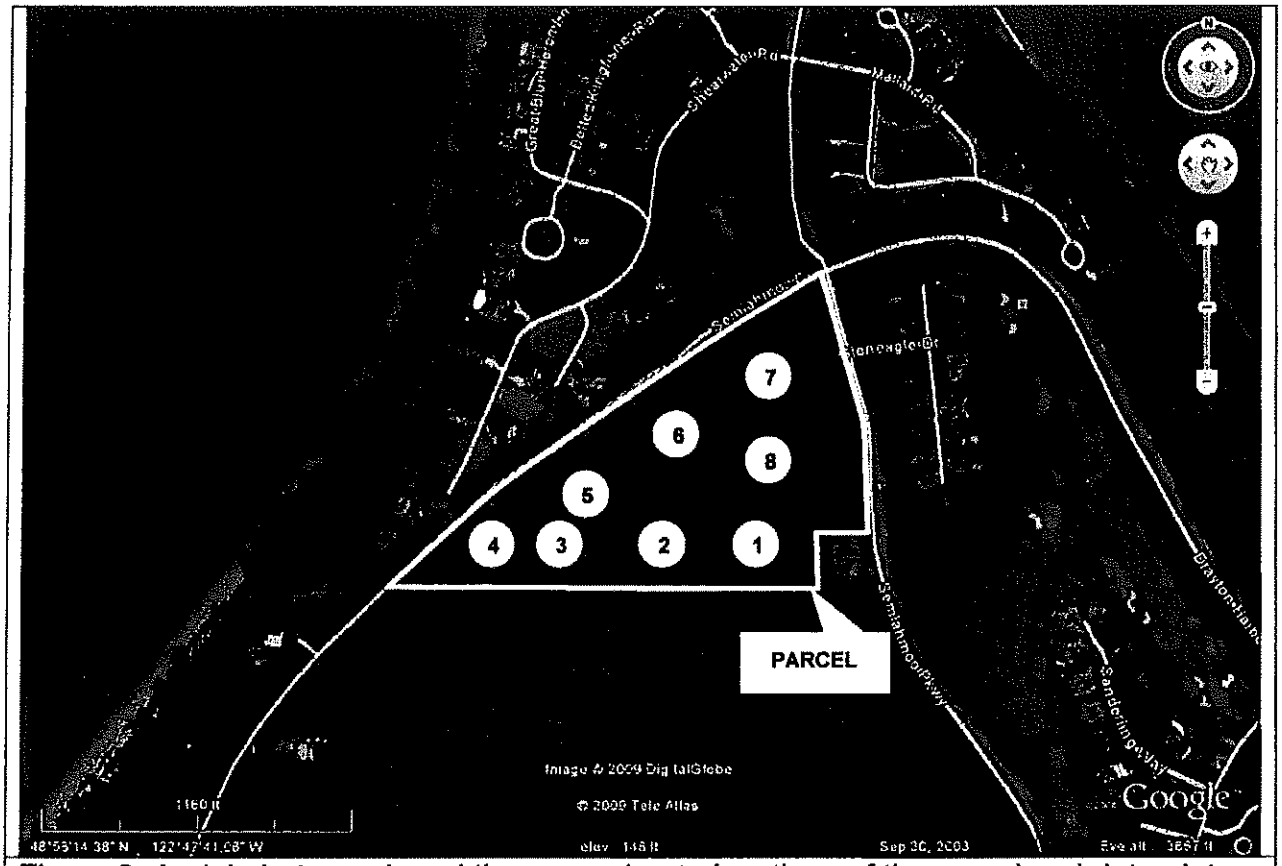

Figure 2. Aerial photograph and the approximate locations of the parcel and data plots #1 through #8.

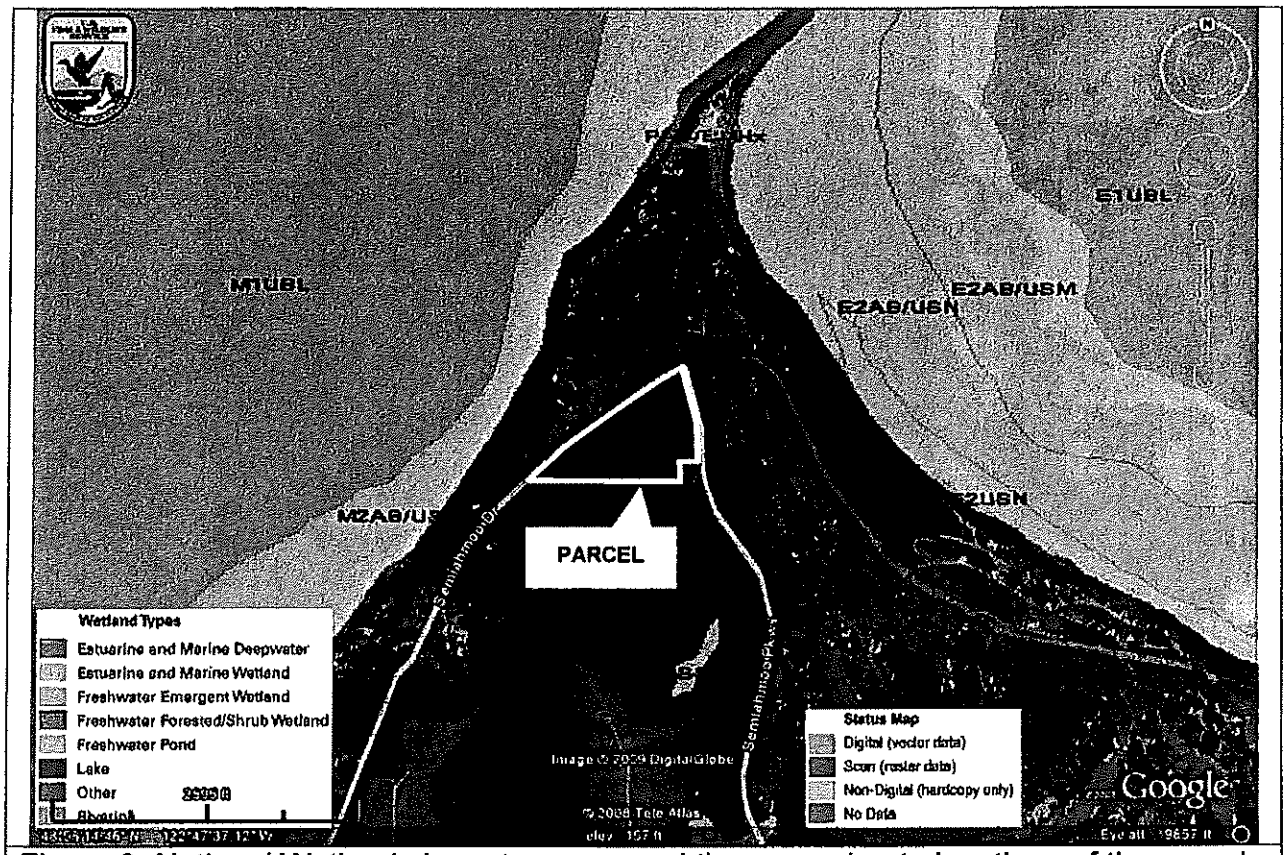

Figure 3. National Wetlands Inventory map and the approximate locations of the parcel and wetlands in the area.

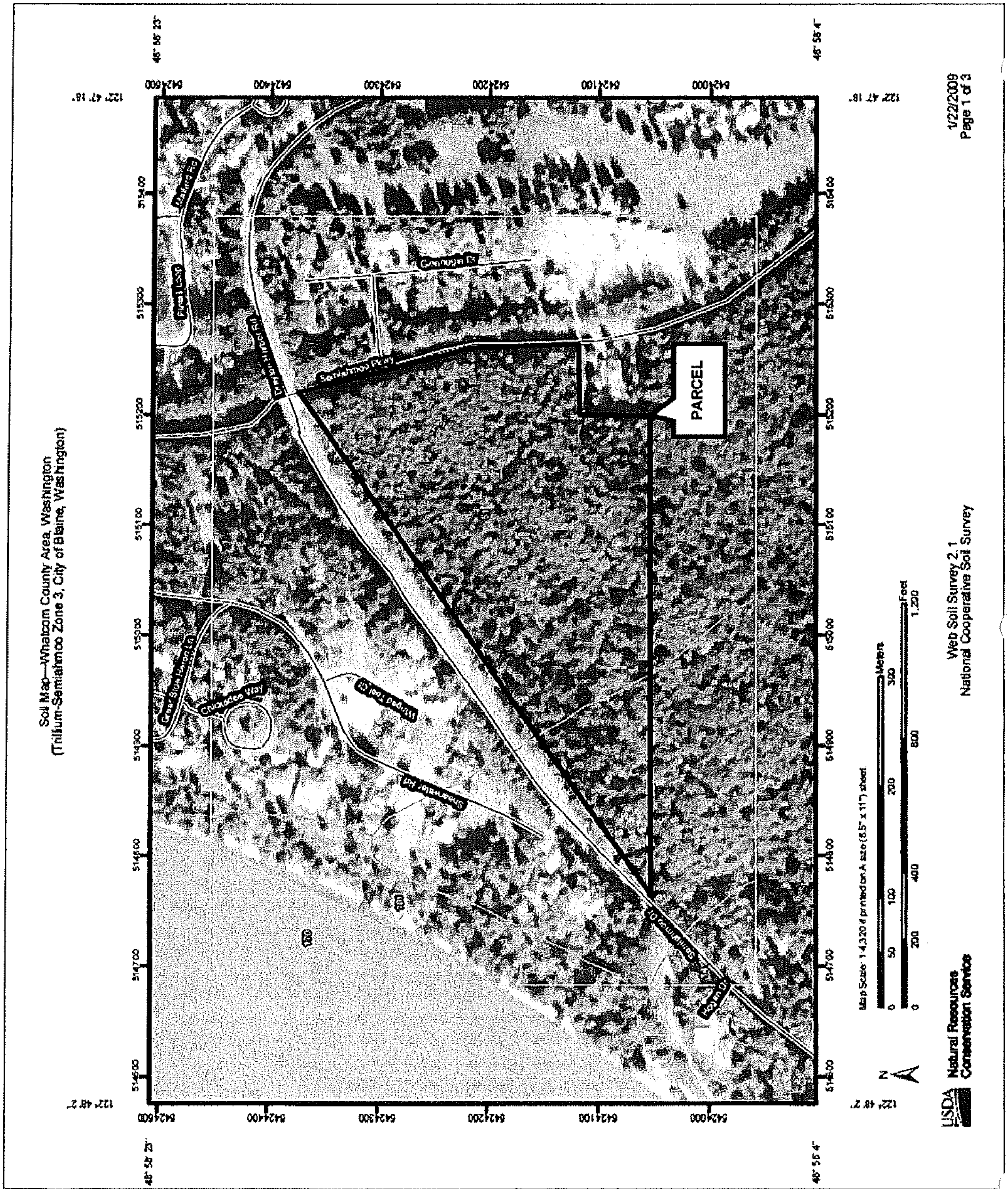

Figure 4. Natural Resources Conservation Service soil survey map and the approximate locations of the parcel and soils in the area.

Appendix B: Data Forms

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Semiahmoo-Zone 3	Sampling Date:	20 January 2009
Applicant/Owner:	Trillium Corporation	Sampling Point:	1
Investigator:	Jim Wiggins and Karla Van Leaven	City/County:	Blaine
Section, Township, Range:	2, 40 north, 1 west Willamette Meridian	State:	Washington
Landform (hillslope, terrace, etc) Terrace	Slope (%) 1	Local relief (concave, convex, none) None	
Subregion (LRR) A	Lat 48°58'13.27"N	Long 122°47'37.12"W	Datum WGS84
Soil Map Unit Name 51-Everett complex, 2 to 8 percent 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 "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil, ☐, or Hydrology ☐ significantly disturbed?
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 Soils Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Is this Sampling Point within a Wetland? ☐ Yes ☒ No

Remarks: Hydrologic conditions on the site were not typical for this time of year due to the snow melt and excessive rainfall that occurred prior to our site visit. Upland forest plot located on the southeast portion of the parcel. Indicators of hydrophytic vegetation, hydric soil, and wetland hydrology were not present; therefore, since all three parameters were not met, data plot #1 was not located within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pseudotsuga menziesii*	40	Yes	FACU
2. *Acer macrophyllum*	20	Yes	FACU
3. *Thuja plicata* Reprod.	10	No	FAC
4.			
50 percent threshold equals 35 percent; 20 percent threshold equals 14 percent	70	= Total Cover	
Sapling/Shrub Stratum (Plot size 5 foot radius)			
1. *Symphoricarpos albus*	15	Yes	FACU
2.			
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size 5 foot radius)			
1. *Polystichum munitum*	50	Yes	FACU
2. *Mahonia nervosa*	20	Yes	FACU
3. *Rubus ursinus*	10	No	FACU
4. *Urtica diocia*	5	No	FAC
5. *Pteridium aquilinum*	2	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
50 percent threshold equals 43.5 percent; 20 percent threshold equals 17.4 percent	87	= Total Cover	
Woody Vine Stratum (Plot size 30 foot radius)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 13

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index Worksheet

Total % Cover of		Multiply by	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	157	x 4 =	628
UPL species	0	x 5 =	0
Column totals	172	(A)	673 (B)

Prevalence Index = B / A = 3.9

Hydrophytic Vegetation Indicators

No	Dominance test is > 50%
No	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Indicators of hydrophytic vegetation were absent. Less than 50 percent (0 percent) of the dominant species present were FAC, FACW, or OBL and the result of the prevalence test was greater than 3.0 (3.9).

SOIL

Sampling Point 1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/2	100	N/A	N/A	N/A	N/A	Duffy loam	
5-11	7.5YR 3/4	100	N/A	N/A	N/A	N/A	Sandy loam	
11-20	10YR 4/4	100	N/A	N/A	N/A	N/A	Loamy sandy gravel	Variegated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: N/A

Depth (inches): N/A

Hydric soil present? Yes ☐ No ☒

Remarks: Indicators of hydric soil were absent. There were not redoxymorphic features present.

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 **(except MLRA 1, 2, 4A & 4B)** (B9)
- ☐ 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 & 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

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):
Water Table Present?	☐ Yes	☒ No	Depth (in):
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: Indicators of wetland hydrology were absent. Direct or indirect indicators of seasonal or permanent soil saturation or inundation were not observed.

WETLAND DETERMINATION DATA FORM
Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Semiahmoo-Zone 3	Sampling Date:	20 January 2009
Applicant/Owner:	Trillium Corporation	Sampling Point:	2
Investigator:	Jim Wiggins and Karla Van Leaven	City/County:	Blaine
Section, Township, Range:	2, 40 north, 1 west Willamette Meridian	State:	Washington

Landform (hillslope, terrace, etc) Terrace — Slope (%) 1 — Local relief (concave, convex, none) None

Subregion (LRR) A — Lat 48°58'13.27"N — Long 122°47'37.12"W — Datum WGS84

Soil Map Unit Name 51-Everett complex, 2 to 8 percent 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 "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
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 Soils Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Is this Sampling Point within a Wetland? ☐ Yes ☒ No

Remarks: Hydrologic conditions on the site were not typical for this time of year due to the snow melt and excessive rainfall that occurred prior to our site visit. Upland forest plot located on the southern portion of the parcel, west of data plot #1. Indicators of hydrophytic vegetation, hydric soil, and wetland hydrology were absent; therefore, since all three parameters were not met, data plot #2 was not located within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer macrophyllum*	70	Yes	FACU
2. *Alnus rubra*	10	No	FAC
3.			
4.			
50 percent threshold equals 40 percent; 20 percent threshold equals 16 percent	80	= Total Cover	
Sapling/Shrub Stratum (Plot size 5 foot radius)			
1. *Symphoricarpos albus*	97.5	Yes	FACU
2.			
3.			
4.			
5.			
	97.5	= Total Cover	
Herb Stratum (Plot size 5 foot radius)			
1. *Polystichum munitum*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10	= Total Cover	
Woody Vine Stratum (Plot size 30 foot radius)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 90

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	177.5	x 4 =	710
UPL species	0	x 5 =	0
Column totals	187.5 (A)		740 (B)

Prevalence Index = B / A = 3.9

Hydrophytic Vegetation Indicators

No	Dominance test is > 50%
No	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Indicators of hydrophytic vegetation were absent. Less than 50 percent (0 percent) of the dominant species present were FAC, FACW, or OBL and the result of the prevalence test was greater than 3.0 (3.9).

SOIL

Sampling Point 2

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 %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100	N/A	N/A	N/A	N/A	Duffy loam	
3-18	7.5YR 3/2	100	N/A	N/A	N/A	N/A	Sandy gravelly loam	
18-20	10YR 3/3	100	N/A	N/A	N/A	N/A	Loamy gravelly sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes ☐ No ☒

Remarks: Indicators of hydric soil were absent. There were no redoxymorphic features present.

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 **(except MLRA 1, 2, 4A & 4B)** (B9)
- ☐ 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 & 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

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):	
Water Table Present?	☒ Yes	☐ No	Depth (in):	18
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):	

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: Indicators of wetland hydrology were absent. Although the water table was present, it was located at a depth greater than 12 inches (18 inches).

WETLAND DETERMINATION DATA FORM
Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Semiahmoo-Zone 3	Sampling Date:	20 January 2009
Applicant/Owner:	Trillium Corporation	Sampling Point:	3
Investigator:	Jim Wiggins and Karla Van Leaven	City/County:	Blaine
Section, Township, Range:	2, 40 north, 1 west Willamette Meridian	State:	Washington

Landform (hillslope, terrace, etc) Terrace — Slope (%) 1 — Local relief (concave, convex, none) None

Subregion (LRR) A — Lat 48°58'13.27"N — Long 122°47'37.12"W — Datum WGS84

Soil Map Unit Name 48-Everett gravelly sandy loam, hard substratum, 2 to 8 percent 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 "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
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 Soils Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Is this Sampling Point within a Wetland? ☐ Yes ☒ No

Remarks: Hydrologic conditions on the site were not typical for this time of year due to the snow melt and excessive rainfall that occurred prior to our site visit. Upland forest plot located on the southern portion of the parcel, west of data plot #2. Indicators of hydrophytic vegetation, hydric soil, and wetland hydrology were absent; therefore, since all three parameters were not met, data plot #3 was not located within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	60	Yes	FAC
2. *Acer macrophyllum*	40	Yes	FACU
3. *Acer circinatum*	20	No	FAC
4.			
50 percent threshold equals 60 percent; 20 percent threshold equals 24 percent	120	= Total Cover	
Sapling/Shrub Stratum (Plot size 5 foot radius)			
1. *Acer circinatum*	20	Yes	FAC
2. *Oemleria cerasiformis*	10	Yes	FACU
3. *Symphoricarpos albus*	10	Yes	FACU
4. *Rubus spectabilis*	5	No	FAC
5.			
50 percent threshold equals 22.5 percent; 20 percent threshold equals 9 percent	45	= Total Cover	
Herb Stratum (Plot size 5 foot radius)			
1. *Polystichum munitum*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10	= Total Cover	
Woody Vine Stratum (Plot size 30 foot radius)			
1.			
2.			
	0	= 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: 6 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index Worksheet

	Total % Cover of		Multiply by
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	105	x 3 =	315
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column totals	175	(A)	595 (B)

Prevalence Index = B / A = 3.4

Hydrophytic Vegetation Indicators

No	Dominance test is > 50%
No	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Indicators of hydrophytic vegetation were absent. Less than 50 percent (33 percent) of the dominant species present were FAC, FACW, or OBL and the result of the prevalence test was greater than 3.0 (3.4).

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 %	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR 2/2	100	N/A	N/A	N/A	N/A	Duffy sandy loam	
13-20	10YR 4/1	100	N/A	N/A	N/A	N/A	Loamy gravelly sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes ☐ No ☒

Remarks: Indicators of hydric soil were absent. There were no redoxymorphic features present.

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 **(except MLRA 1, 2, 4A & 4B)** (B9)
- ☐ 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 & 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

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):	
Water Table Present?	☒ Yes	☐ No	Depth (in):	19
Saturation Present? (Includes capillary fringe)	☐ Yes	☒ No	Depth (in):	

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: Indicators of wetland hydrology were absent. Although the water table was present, it was located at a depth greater than 12 inches (19 inches).

WETLAND DETERMINATION DATA FORM
Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Semiahmoo-Zone 3	Sampling Date:	20 January 2009
Applicant/Owner:	Trillium Corporation	Sampling Point:	4
Investigator:	Jim Wiggins and Karla Van Leaven	City/County:	Blaine
Section, Township, Range:	2, 40 north, 1 west Willamette Meridian	State:	Washington

Landform (hillslope, terrace, etc) Terrace — Slope (%) 1 — Local relief (concave, convex, none) None

Subregion (LRR) A — Lat 48°58'13.27"N — Long 122°47'37.12"W — Datum WGS84

Soil Map Unit Name 48-Everett gravelly sandy loam, hard substratum, 2 to 8 percent 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 "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
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 this Sampling Point within a Wetland?** ☐ Yes ☒ No
Hydric Soils Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Remarks: Hydrologic conditions on the site were not typical for this time of year due to the snow melt and excessive rainfall that occurred prior to our site visit. Wet area plot located on the southwest portion of the parcel, west of data plot #3. Indicators of hydrophytic vegetation were present while indicators of hydric soil and wetland hydrology were absent; therefore, since all three parameters were not met, data plot #4 was not located within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer macrophyllum*	30	Yes	FACU
2. *Thuja plicata*	30	Yes	FAC
3. *Alnus rubra*	10	No	FAC
4. *Pseudotsuga menziesii*	5	No	FACU
50 percent threshold equals 37.5; 20 percent threshold equals 15	75	= Total Cover	
Sapling/Shrub Stratum (Plot size 5 foot radius)			
1. *Rubus spectabilis*	40	Yes	FAC
2. *Acer circinatum*	10	Yes	FAC
3. *Holodiscus discolor**	10	N/A	NI
4.			
5.			
50 percent threshold equals 25 percent; 20 percent threshold equals 10 percent	50	= Total Cover	
Herb Stratum (Plot size 5 foot radius)			
1. *Polystichum munitum*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10	= Total Cover	
Woody Vine Stratum (Plot size 30 foot radius)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 90

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		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

Yes	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Indicators of hydrophytic vegetation were present. Greater than 50 percent (75 percent) of the dominant species present were FAC, FACW, or OBL. *Not listed on the National List and therefore was not used to determine dominance and is not represented in the total cover.

SOIL

Sampling Point 4

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 %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100	N/A	N/A	N/A	N/A	Sandy loam	
12-20	10YR 3/2+	100	N/A	N/A	N/A	N/A	Loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes ☐ No ☒

Remarks: Indicators of hydric soil were absent. There were no redoxymorphic features present.

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 **(except MLRA 1, 2, 4A & 4B)** (B9)
- ☐ 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 & 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

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):	
Water Table Present?	☒ Yes	☐ No	Depth (in):	1
Saturation Present? (includes capillary fringe)	☒ Yes	☐ No	Depth (in):	0

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: Indicators of wetland hydrology were absent. Although the water table was present at 1 inch, and saturation was present at 0 inches; it is our best professional judgment that the hydrology present was a result of the snow melt and excessive rains in the weeks prior to our site visit and we do not believe that the hydrology is present long enough during the growing season to satisfy the wetland hydrology indicators.

WETLAND DETERMINATION DATA FORM
Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Semiahmoo-Zone 3	Sampling Date:	20 January 2009
Applicant/Owner:	Trillium Corporation	Sampling Point:	5
Investigator:	Jim Wiggins and Karla Van Leaven	City/County:	Blaine
Section, Township, Range:	2, 40 north, 1 west Willamette Meridian	State:	Washington
Landform (hillslope, terrace, etc) Terrace	Slope (%) 0	Local relief (concave, convex, none) None	
Subregion (LRR) A	Lat 48°58'13.27"N	Long 122°47'37.12"W	Datum WGS84
Soil Map Unit Name 48-Everett gravelly sandy loam, hard substratum, 2 to 8 percent 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 "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil, ☐, or Hydrology ☐ significantly disturbed?
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 this Sampling Point within a Wetland?** ☐ Yes ☒ No
Hydric Soils Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Remarks: Hydrologic conditions on the site were not typical for this time of year due to the snow melt and excessive rainfall that occurred prior to our site visit. Upland forest plot located on the northern portion of the parcel, northeast of data plot #4. Indicators of hydrophytic vegetation, hydric soil, and wetland hydrology were absent; therefore, since all three parameters were not met, data plot #5 was not located within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Abies grandis*	40	Yes	FACU
2. *Pseudotsuga menziesii*	40	Yes	FACU
3. *Thuja plicata* Reprod.	30	Yes	FAC
4.			
50 percent threshold equals 55 percent; 20 percent threshold equals 22 percent	110	= Total Cover	
Sapling/Shrub Stratum (Plot size 5 foot radius)			
1. *Acer circinatum*	15	Yes	FAC
2.			
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size 5 foot radius)			
1. *Polystichum munitum*	80	Yes	FACU
2. *Althyrium filix-femina*	5	No	FAC
3. *Rubus ursinus*	5	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
50 percent threshold equals 45 percent; 20 percent threshold equals 18 percent	90	= Total Cover	
Woody Vine Stratum (Plot size 30 foot radius)			
1.			
2.			
	0	= 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	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	165	x 4 =	660
UPL species	0	x 5 =	0
Column totals	215	(A)	810 (B)

Prevalence Index = B / A = 3.8

Hydrophytic Vegetation Indicators

No	Dominance test is > 50%
No	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Indicators of hydrophytic vegetation were absent. Less than 50 percent (40 percent) of the dominant species present were FAC, FACW, or OBL and the result of the prevalence test was greater than 3.0 (3.8).

SOIL

Sampling Point 5

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	100	N/A	N/A	N/A	N/A	Duffy loam	
4-16	10YR 3/3	100	N/A	N/A	N/A	N/A	Sandy gravelly loam	
16-20	10YR 3/4	100	N/A	N/A	N/A	N/A	Loamy sandy gravel	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes ☐ No ☒

Remarks: Indicators of hydric soil were absent. There were no redoxymorphic features present.

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 **(except MLRA 1, 2, 4A & 4B)** (B9)
- ☐ 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 & 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

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):
Water Table Present?	☐ Yes	☒ No	Depth (in):
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: Indicators of wetland hydrology were absent. Direct or indirect indicators of seasonal or permanent soil saturation or inundation were not observed.

WETLAND DETERMINATION DATA FORM
Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Semiahmoo-Zone 3	Sampling Date:	20 January 2009
Applicant/Owner:	Trillium Corporation	Sampling Point:	6
Investigator:	Jim Wiggins and Karla Van Leaven	City/County:	Blaine
Section, Township, Range:	2, 40 north, 1 west Willamette Meridian	State:	Washington
Landform (hillslope, terrace, etc) Mound	Slope (%) 0	Local relief (concave, convex, none) None	
Subregion (LRR) A	Lat 48°58'13.27"N	Long 122°47'37.12"W	Datum WGS84
Soil Map Unit Name 51-Everett complex, 2 to 8 percent 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 "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil, ☐, or Hydrology ☐ significantly disturbed?
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 this Sampling Point within a Wetland?** ☐ Yes ☒ No
Hydric Soils Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Remarks: Hydrologic conditions on the site were not typical for this time of year due to the snow melt and excessive rainfall that occurred prior to our site visit. Upland forest plot located on the northern portion of the parcel, northeast of data plot #5. Indicators of hydrophytic vegetation, hydric soil, and wetland hydrology were absent; therefore, since all three parameters were not met, data plot #6 was not located within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pseudotsuga menziesii*	40	Yes	FACU
2. *Betula papyrifera*	20	Yes	FAC
3. *Thuja plicata* Reprod.	10	No	FAC
4.			
50 percent threshold equals 35 percent; 20 percent threshold equals 14 percent	70	= Total Cover	
Sapling/Shrub Stratum (Plot size 5 foot radius)			
1. *Acer circinatum*	40	Yes	FAC
2. *Ilex* sp.	5	No	UNK
3. *Rubus spectabilis*	1	No	FAC
4.			
5.			
50 percent threshold equals 23 percent; 20 percent threshold equals 9.2 percent	46	= Total Cover	
Herb Stratum (Plot size 5 foot radius)			
1. *Rubus ursinus*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10	= Total Cover	
Woody Vine Stratum (Plot size 30 foot radius)			
1.			
2.			
	0	= 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:	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	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	71	x 3 =	213
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column totals	121	(A)	413 (B)

Prevalence Index = B / A = 3.4

Hydrophytic Vegetation Indicators

No	Dominance test is > 50%
No	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Indicators of hydrophytic vegetation were absent. Fifty percent of the dominant species present were FAC, FACW, or OBL and the result of the prevalence test was greater than 3.0 (3.4).

SOIL

Sampling Point 6

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 %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100	N/A	N/A	N/A	N/A	Duffy sandy loam	
10-20	10YR 3/6	100	N/A	N/A	N/A	N/A	Loamy gravelly sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: N/A
Depth (inches): N/a

Hydric soil present? Yes ☐ No ☒

Remarks: Indicators of hydric soil were absent. There were no redoxymorphic features present.

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 **(except MLRA 1, 2, 4A & 4B)** (B9)
- ☐ 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 & 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

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):
Water Table Present?	☐ Yes	☒ No	Depth (in):
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: Indicators of wetland hydrology were absent. Direct or indirect indicators of seasonal or permanent soil saturation or inundation were not observed.

WETLAND DETERMINATION DATA FORM
Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Semiahmoo-Zone 3	Sampling Date:	20 January 2009
Applicant/Owner:	Trillium Corporation	Sampling Point:	7
Investigator:	Jim Wiggins and Karla Van Leaven	City/County:	Blaine
Section, Township, Range:	2, 40 north, 1 west Willamette Meridian	State:	Washington

Landform (hillslope, terrace, etc) Terrace — Slope (%) 0 — Local relief (concave, convex, none) None

Subregion (LRR) A — Lat 48°58'13.27"N — Long 122°47'37.12"W — Datum WGS84

Soil Map Unit Name 51-Everett complex, 2 to 8 percent 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 "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
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 Soils Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Is this Sampling Point within a Wetland? ☐ Yes ☒ No

Remarks: Hydrologic conditions on the site were not typical for this time of year due to the snow melt and excessive rainfall that occurred prior to our site visit. Upland forest plot located on the northern portion of the parcel, northeast of data plot #6. Indicators of hydrophytic vegetation were present while indicators of hydric soil and wetland hydrology were absent; therefore, since all three parameters were not met, data plot #7 was not located within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	30	Yes	FAC
2. *Acer macrophyllum*	10	No	FACU
3. *Pseudotsuga menziesii*	10	No	FACU
4. *Thuja plicata*	10	No	FAC
50 percent threshold equals 30 percent; 20 percent threshold equals 12 percent	60	= Total Cover	
Sapling/Shrub Stratum (Plot size 5 foot radius)			
1. *Acer circinatum*	10	Yes	FAC
2. *Symphoricarpos albus*	5	Yes	FACU
3.			
4.			
5.			
50 percent threshold equals 7.5 percent; 20 percent threshold equals 3	15	= Total Cover	
Herb Stratum (Plot size 5 foot radius)			
1. *Polystichum munitum*	10	Yes	FACU
2. *Urtica diocia*	5	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
50 percent threshold equals 7.5 percent; 20 percent threshold equals 3	15	= Total Cover	
Woody Vine Stratum (Plot size 30 foot radius)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 85

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		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

Yes	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Indicators of hydrophytic vegetation were present. Greater than 50 percent (60 percent) of the dominant species present were FAC, FACW, or OBL.

SOIL

Sampling Point 7

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	100	N/A	N/A	N/A	N/A	Duffy sandy loam	
4-20	10YR 3/3	100	N/A	N/A	N/A	N/A	Gravelly sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: N/A

Depth (inches): N/A

Hydric soil present? Yes ☐ No ☒

Remarks: Indicators of hydric soil were absent. There were no redoxymorphic features present.

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 (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ 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 & 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

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):
Water Table Present?	☐ Yes	☒ No	Depth (in):
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: Indicators of wetland hydrology were absent. Direct or indirect indicators of seasonal or permanent soil saturation or inundation were not observed.

WETLAND DETERMINATION DATA FORM
Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

Project Site:	Semiahmoo-Zone 3	Sampling Date:	20 January 2009
Applicant/Owner:	Trillium Corporation	Sampling Point:	8
Investigator:	Jim Wiggins and Karla Van Leaven	City/County:	Blaine
Section, Township, Range:	2, 40 north, 1 west Willamette Meridian	State:	Washington
Landform (hillslope, terrace, etc) Terrace	Slope (%) 0	Local relief (concave, convex, none) None	
Subregion (LRR) A	Lat 48°58'13.27"N	Long 122°47'37.12"W	Datum WGS84
Soil Map Unit Name 51-Everett complex, 2 to 8 percent 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 "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
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 this Sampling Point within a Wetland?** ☐ Yes ☒ No
Hydric Soils Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Remarks: Hydrologic conditions on the site were not typical for this time of year due to the snow melt and excessive rainfall that occurred prior to our site visit. Upland forest plot located on the southeast portion of the parcel, southeast of data plot #7. Indicators of hydrophytic vegetation were present while indicators of hydric soil and wetland hydrology were absent; therefore, since all three parameters were not met, data plot #8 was not located within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	40	Yes	FAC
2. *Thuja plicata*	40	Yes	FAC
3.			
4.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size 5 foot radius)			
1. *Acer circinatum*	15	Yes	FAC
2.			
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size 5 foot radius)			
1. *Polystichum munitum*	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15	= Total Cover	
Woody Vine Stratum (Plot size 30 foot radius)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 85

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		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

Yes	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Indicators of hydrophytic vegetation were present. Greater than 50 percent (75 percent) of the dominant species present were FAC, FACW, or OBL.

SOIL

Sampling Point 8

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 %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/2	100	N/A	N/A	N/A	N/A	Duffy sandy loam	
1-20	10YR 3/3	100	N/A	N/A	N/A	N/A	Gravelly sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: 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]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes ☐ No ☒

Remarks: Indicators of hydric soil were absent. There were no redoxymorphic features present.

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 **(except MLRA 1, 2, 4A & 4B)** (B9)
- ☐ 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 & 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

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):
Water Table Present?	☐ Yes	☒ No	Depth (in):
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: Indicators of wetland hydrology were absent. Direct or indirect indicators of seasonal or permanent soil saturation or inundation were not observed.

Appendix A: Figures

Trillium-Semiahmoo Zone 3, City of Blaine, Washington

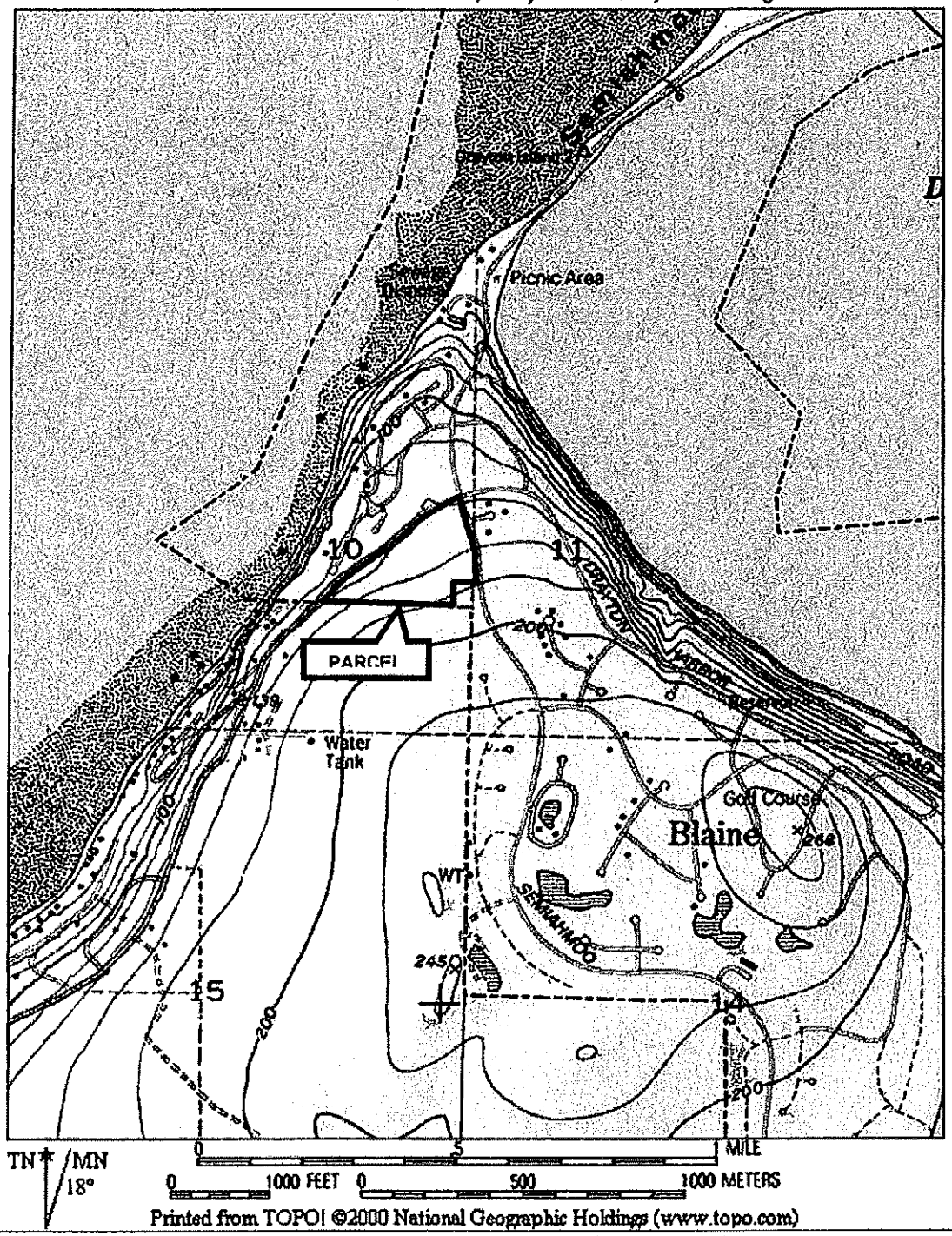

Figure 1. Vicinity map and the approximate location of the parcel.

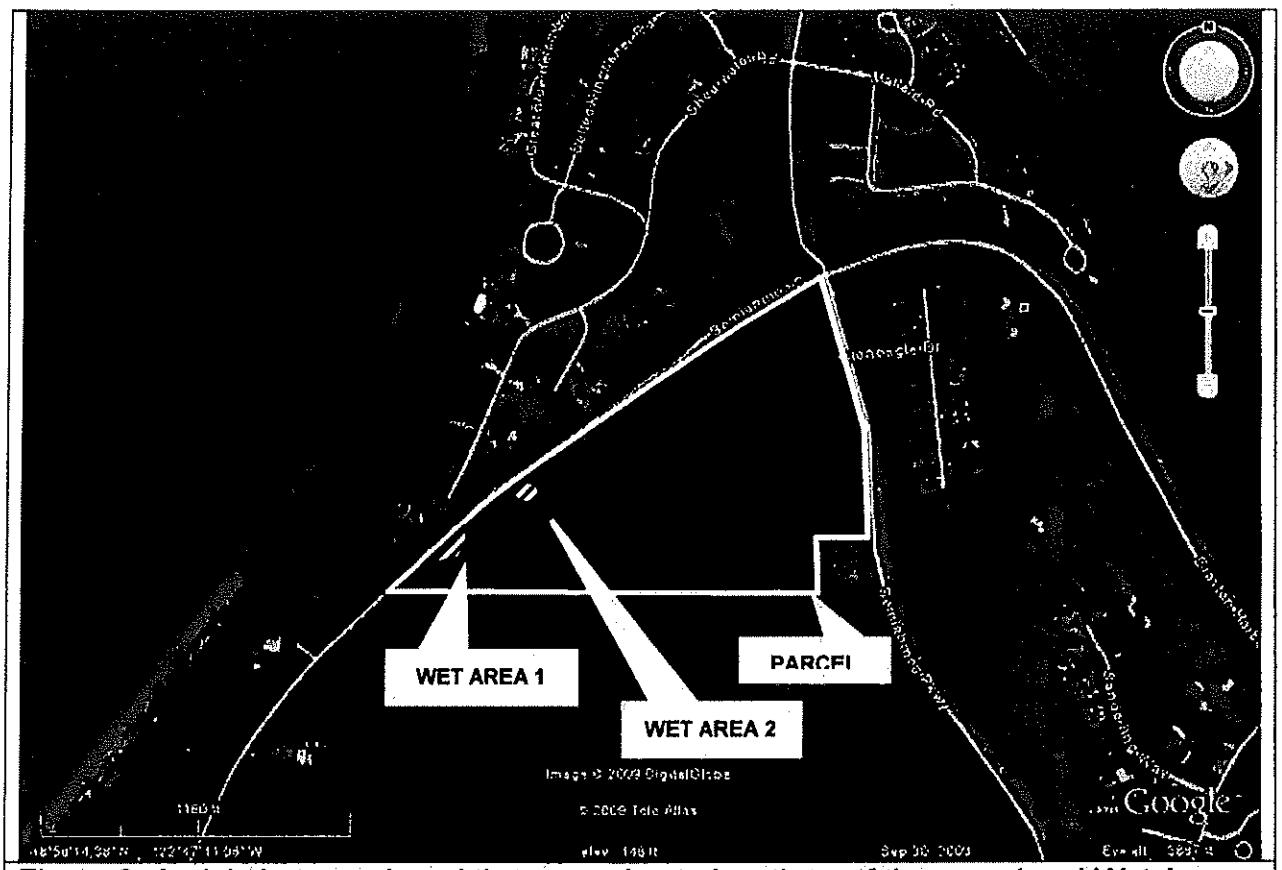

Figure 2. Aerial photograph and the approximate locations of the parcel and Wet Areas 1 and 2.

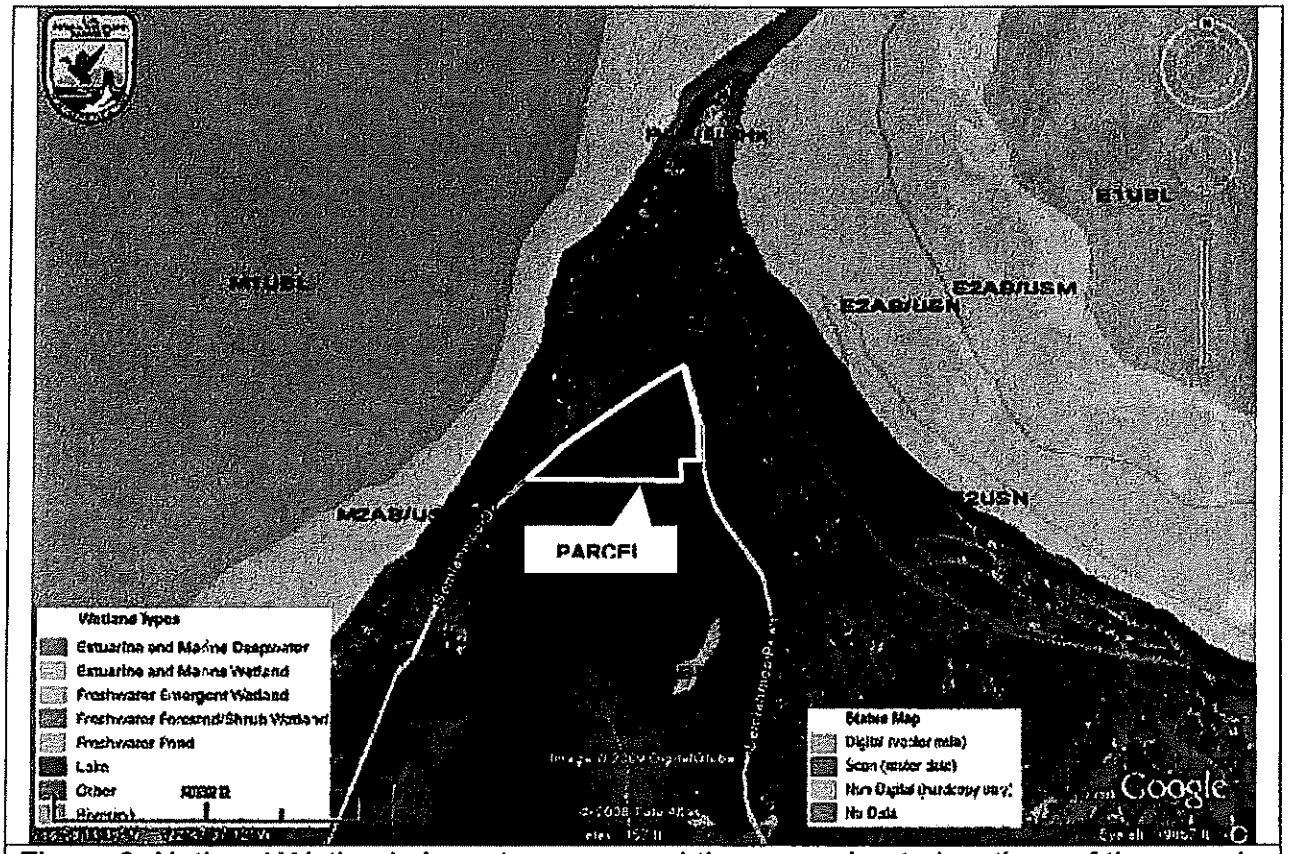

Figure 3. National Wetlands Inventory map and the approximate locations of the parcel and wetlands in the area.

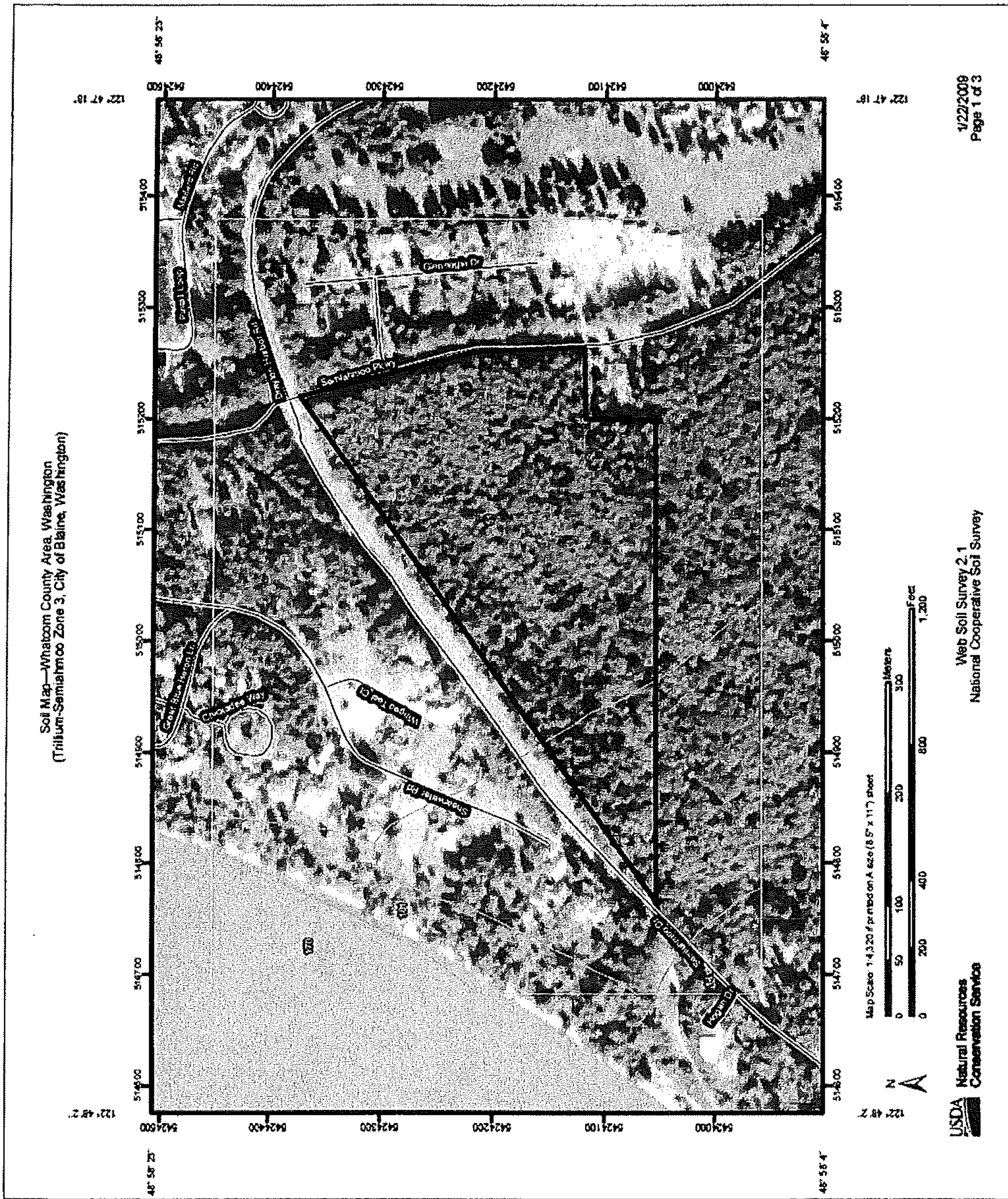

Figure 4. Natural Resources Conservation Service soil survey map and the approximate locations of the parcel and soils in the area.