CRITICAL AREAS STUDY

Inneswood Estates
Stormwater Vault Mitigation Plan

Prepared for:

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Issaquah, WA 98027

Prepared on behalf of:

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CRITICAL AREAS STUDY

INNESWOOD ESTATES
STORMWATER VAULT MITIGATION PLAN

1 INTRODUCTION

This critical area study provides details on the proposed Inneswood Estates Stormwater Vault Mitigation Plan. The plan seeks to enhance a low-functioning wetland and on-site wetland and stream buffer areas. The enhancement allows for the construction of a stormwater vault on the property as part of the development proposal for the Inneswood Estates complex located across Newport Way NW to the west.

Issaquah Municipal Code (IMC) 18.10.410 requires compliance with specific critical areas study criteria as part of any critical area or critical area buffer modification proposal. This study fulfills these criteria and documents how the proposed project is expected to result in a net gain in ecological functions.

2 PROJECT AREA

The project area is parcel 8844300100, located at 798 NW Juniper Street in the City of Issaquah (City), Washington. This .60-acre parcel is located immediately to the northeast of the intersection of NW Juniper Street and Newport Way NW. See Figures 1 and 2 below.

No major structures are currently located on the parcel, and the parcel is classified as "Vacant (Commercial)" by the King County Department of Assessments. The property is zoned Mixed Use Residential by the City.

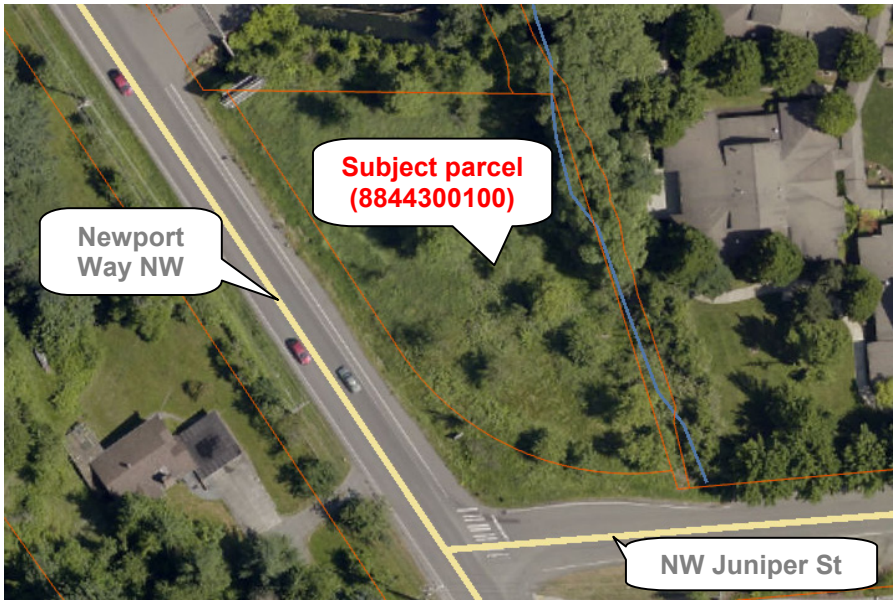


Figure 1. 2013 aerial photo of subject parcel and surrounding area (Source: King County iMAP)

Figure 2. 2015 photo of subject parcel, looking northwest (Newport Way NW in background)

The subject parcel is situated on a low-gradient slope (less than 5%) and drains from southwest to northeast into Stream A, which flows along the eastern boundary of the parcel. Water also enters the parcel via a stormwater culvert beneath Newport Way NW near the west parcel boundary. The stormwater sheet flows through a low grassy field eastward along the north half of the subject property towards Stream A. Grassy hummocks with shallow depressions and clusters of domestic orchard trees (*Pyrus spp.* and *Prunus spp.*) surrounded

by Himalayan blackberry (*Rubus armeniacus*) dominate the upland areas. There is evidence of both natural and human disturbance. Soil mounds on the surface indicate the activity of burrowing animals such as moles; the grassy field is a remnant from historic mowing.

Wetland A is located in the north portion of the parcel. Wetland A is a slope and depressional wetland with palustrine emergent, palustrine scrub-shrub, and palustrine forested Cowardin vegetation classes present. Surface water enters the wetland via the stormwater culvert on the western boundary of the parcel and forms a seasonal flow into Stream A. There are also shallow depressions in the wetland that are seasonally filled with a combination of groundwater and surface water from the culvert discharge. Vegetation consists mostly of reed canarygrass (*Phalaris arundinacea*), with a cluster of red alder trees (*Alnus rubra*), Douglas spiraea (*Spiraea douglasii*) and cluster rose (*Rosa pisocarpa*) in a shallow depression along the upper slope. Vegetation gradually transitions into Pacific willow (*Salix lucida*) and Western crabapple (*Malus fusca*) along the stream; Himalayan blackberry encroaches into the wetland from the upland area to the south.

The south half of the parcel is characterized by non-wetland. Several old domesticated apple (*Malus domestica*) and cherry trees (*Prunus avium*), in various states of declining health, are growing in this area, with patches of Himalayan blackberry brambles, mixed field grasses, and dandelion (*Taraxacum officinale*), growing in the understory. The gently sloping transition zone from wetland to non-wetland is somewhat gradual. Patches of soft rush (*Juncus effusus*) and creeping buttercup (*Ranunculus repens*) mix with dandelion and Himalayan blackberry.

Stream A is a low-gradient ditched stream fed by a stormwater culvert along NW Juniper Street. It also receives surface water from Wetland A and sheet flow from the upland area of the subject parcel. The stream is in the form of a drainage ditch constructed before 1920. Areas bordering the ditch near the subject parcel were previously under cultivation, including Wetland A. Stream A flows from south to north and eventually connects through several culverts, a public storm drain, and daylight channels to Tibbetts Creek, then into Lake Sammamish. There is no known fish passage or fish habitat along Stream A.

The subject property has been the subject of numerous development proposals for a number of years. Under one "reasonable use" development plan that received considerable City review, a commercial building with first-floor parking was proposed to permanently impact nearly all of the wetland buffer. This development was not constructed.

Please see the delineation study in Appendix A for more details on existing site conditions.

3 PROJECT DESCRIPTION

The proposed Stormwater Vault Mitigation Plan project addressed by this critical areas report consists of two main elements:

1. **Stormwater Vault** – Installation of a stormwater vault beneath the finished grade of the subject parcel.

2. **Critical Area Restoration** – Restoration of Wetland A, the buffer of Wetland A, and the buffer of Stream A.

The purposes of this project are to provide additional stormwater capacity for development and associated required street improvements of the Inneswood Estates project and to improve the water quality, wildlife habitat and hydrologic function of the natural areas retained on the subject parcel.

The City previously gave conceptual approval to the proposed project.

Further description of each of the two main project elements follow in the below subsections. Plans for the proposed Stormwater Vault Mitigation Plan project are provided in Appendix B.

Stormwater Vault

Additional stormwater capacity is needed in connection with development and associated required street improvements of the Inneswood Estates project. This additional capacity is proposed to be housed in a stormwater vault to be located beneath the finished grade of the subject parcel.

Two options for other detention vault locations include one within the ten-lot preliminary plat development at top of slope, but this would eliminate one lot and reduce the development to nine lots. The City encouraged development of the tenth lot and relocation of the detention vault. The second option is incorporating the ten-lot plat storm flows into the proposed Apartment B detention vault. This would require oversizing of the Apartment B vault such that there would be significant additional excavation into the steep slope behind the apartment creating much higher retaining walls. It is important to note that even though the size of the proposed stormwater vault has been maximized based on the site physical and environmental constraints, it does not provide the

required full capacity. The additional detention capacity is being provided through oversizing the Apartment B detention vault.

Approximately 2,403 square feet of the stormwater vault would be located beneath the buffers of Wetland A and Stream A. However, no portion of the stormwater vault would be located beneath Wetland A or Stream A and no direct impact to either feature is planned.

The stormwater vault would have 2.9 feet of topsoil placed above it. This topsoil would be held in place by a 3.5-foot retaining wall extending above the eastern edge of the stormwater vault. This location avoids further encroachment by structures into buffer areas. The transition area from the stormwater vault to the stream would feature a 2:1 slope.

Native vegetation would be planted above the stormwater vault, including vine maple (*Acer circinatum)*, oceanspray (*Holodiscus discolor*), tall Oregon grape (*Mahonia aquifolium*), red-flowering currant (*Ribes sanguineum*), nootka rose (*Rosa nutkana*), thimbleberry (*Rubus parvifolius*), and snowberry (*Symphoricarpos albus*).

The 2.9 feet of topsoil depth would provide adequate soil volume for the trees and shrubs that would be planted there. Tree and shrub root architecture is determined by soil, climate, and species. While many species of trees and shrubs prefer to grow deep taproots where conditions permit, trees and shrubs often spread roots horizontally due to factors such as soil compaction and poor drainage. In the Pacific Northwest, glacial till commonly forms a hardpan layer that perches the water table and restricts roots. Accordingly, most native trees and shrubs can successfully establish in shallow soil depths by developing more dominant horizontal roots.

The stormwater vault would feature a permanent outfall located near the northern corner of the stormwater vault in the wetland and stream buffer. The outfall would feature a splash pad located entirely outside the wetland boundary and stream banks.

All above-ground stormwater vault maintenance access would be outside the wetland buffer.

Critical Area Restoration

The overall goal of the enhancement would be to improve the water quality, wildlife habitat, and hydrologic function of the natural areas retained on the site. Another goal is to provide permanent protection of the wetland, stream and buffer areas from future development.

Restoration of Wetland A and its buffer, as well as the buffer of Stream A, would involve the clearing existing non-native vegetation, soil amendments, topsoil

placement, and installation of a diverse assemblage of native trees, shrubs and groundcovers. Additionally, woody debris would be placed throughout as habitat logs and small woody debris piles, or preserved as snags. A split-rail fence would be installed along the perimeter of the wetland and stream buffer for the protection of the critical areas.

Two stormwater dispersion trenches are proposed with the Wetland A buffer, but outside of Wetland A. No location of the dispersion trenches outside of the wetland buffer was feasible.

The limited remaining area of the subject property outside of the critical areas and their buffers will feature an access road, and may otherwise serve as neighborhood open-space recreational amenity.

4 CRITICAL AREAS REGULATIONS

IMC Chapter 18.10, Environmental Protection, includes regulations applicable to development on or adjacent to critical areas. An overview of how the proposed project complies with key regulations is provided below.

IMC 18.10.640.C sets forth standard wetland buffer widths based on wetland category. As discussed in the delineation study (Appendix A), Wetland A is a Category III wetland with a habitat score of 17. Per IMC 18.10.640.C, Category III wetlands with a habitat score of 21 or less have a standard buffer width of 50 feet.

IMC 18.10.785.C sets forth standard stream buffer widths based on stream class. As discussed in the delineation study (Appendix A), Stream A is a Class 4 stream. Per IMC 18.10.785.C.5, Class 4 streams have standard buffer width of 25 feet.

Additionally, per IMC 18.10.515.D, wetlands and streams also require a 15-foot building setback established from the outer edge of the buffer. Minor structural intrusions, including patios and low decks, may be allowed within the setback area.

These standard buffer widths and building setbacks are shown on project plans in Appendix A. No modifications to the standard buffer widths or building setbacks are proposed. The proposed stormwater vault will be located below ground, and would not adversely impact wetland or steam functions and values.

5 FUNCTIONAL ANALYSIS

This section presents an analysis of ecological functions of the two main project elements. Overall, the project is expected to result in improved critical area functions relative to existing conditions.

Stormwater Vault

The presence of the stormwater vault beneath buffer topsoil and vegetation should have no meaningful long-term impact to the wetland condition. Wetland A derives hydrology from a culvert beneath Newport Way NW, a perched groundwater table, and occasional overbank flooding from Stream A. Due to the proximity of Newport Way NW and NW Juniper Street, very little water comes from the limited non-wetland area at the south end of the site above the stormwater vault.

The proposed permanent stormwater vault outlet will disperse detained stormwater to the buffers of Wetland A and Stream A. Stormwater is anticipated to disperse within the buffer area and eventually enter the wetland and stream in roughly equal quantities based on the topographic survey. Since the wetland's outlet to the stream channel is very broad and unconstructed, the addition of detained stormwater is not expected to cause problematic water level fluctuations (WLF). The wetland has some minimal amount of ponding, but does not have quiescent, shallowly ponded thin-stem emergent-dominated areas that would support breeding amphibians. The wetland is currently vegetated with dense reed canary grass, which will be replaced with a dense assemblage of native woody vegetation per the mitigation plan. The proposed woody vegetation tolerates some WLF. Therefore, the fact that WLF-sensitive amphibians and vegetation is not present in this wetland, combined with the low likelihood of the stormwater input causing undue WLF, the permanent vault outfall will have no detrimental effect to Wetland A.

The increased stormwater volume from the road outfall is also not expected to cause detrimental effects because it is also not expected to alter WLF in the wetland, there are no known breeding amphibians, and the restoration planting plan uses species that can tolerate fluctuation.

Critical Area Restoration

Restoration of Wetland A and its buffer, as well as the buffer of Stream A, would involve the clearing existing non-native vegetation, soil amendments, topsoil placement, and installation of a diverse assemblage of native trees, shrubs and groundcovers.

Existing vegetation to be cleared includes invasive weeds such as reed canary grass and Himalayan blackberry. Four existing trees in the buffers , mostly non-native fruit trees of declining health, will also be removed.

Overall, the project includes a total of 23,201 square feet of restoration planting, which represents approximately 89 percent of the total parcel area. The total restoration planting area includes 14,031 square feet of wetland planting and 9,169 square feet of wetland and stream buffer planting (6,555 square feet of planting in the buffer of Wetland A; 5,847 square feet of planting in the buffer of Stream A[1]). Planting is expected to improve ecological functions including water quality, wildlife habitat, and hydrologic function.

Woody debris would be placed throughout the mitigation area as habitat logs and small woody debris piles. Installed woody debris adds to the habitat diversity by increasing vertical structure, perching opportunity and cover.

To help ensure that the proposed project achieves its overall goal of improving the water quality, wildlife habitat, and hydrologic function of the natural areas retained on the site, the plans include performance standards, a monitoring plan to track the success of the project in meeting the performance standards, and a maintenance plan.

Any other viable development proposal at the subject parcel would likely only be possible through reasonable use provisions of the IMC. Given the configuration of the wetland, stream and their buffers, any such development would be located substantially within wetland and stream buffers and result in severe reductions in the ability of the buffers to protect the critical areas. The current proposal provides a functioning buffer of the full standard width required in code.

6 SUMMARY

The subject parcel is currently vacant and dominated by non-native species such as reed canary grass. Wetland A is located in the north portion of the parcel. Stream A flows along the eastern boundary of the parcel. The parcel also features buffer areas for these critical areas.

The proposed project consists of two main elements: installation of a stormwater vault and the restoration of critical areas and their buffers. The proposed

[1] Wetland and stream buffers include area of overlap; therefore, square footages of wetland buffer plantings and streams buffer plantings exceed the total buffer area.

stormwater vault will be located below ground and would not adversely impact wetland or steam functions and values. Restoration of critical areas and buffers would involve the clearing existing non-native vegetation, soil amendments, topsoil placement, and installation of 23,201 square feet of native trees, shrubs and groundcovers. Restoration is expected to improve water quality, wildlife habitat, and hydrologic function in the project area.

APPENDIX A.

DELINEATION STUDY

September 22, 2015

Summit Homes of Washington
16000 Christensen Road
Suite 303
Tukwila, WA 98188

Re: Wetland and Stream Delineation Study, Inneswood Estates
The Watershed Company Reference Number: 141207

To Whom It May Concern:

On January 27, 2015, The Watershed Company ecologists Mike Foster and Rose Whitson conducted a wetland and stream delineation study at 798 NW Juniper Street in Issaquah, Washington (parcel 8844300100).

This letter summarizes the findings of the study and details applicable federal, state, and local regulations. The following attachments are included:

- Wetland Delineation Map
- Wetland Determination Data Forms (1-3)
- Wetland Rating Form for Wetland A

Methods

Public-domain information sources on the subject property were reviewed in office for this delineation study. These sources included:

- Web Soil Survey — U.S. Department of Agriculture Natural Resources Conservation Service
- National Wetland Inventory — U.S. Fish and Wildlife Service
- PHS on the Web — Washington State Department of Fish and Wildlife (WDFW)
- iMAP — King County

During the field visit, the study area was evaluated for wetlands using methodology from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0* (Regional Supplement) (US Army Corps of Engineers [Corps] May 2010). The wetland boundary was determined on the basis of an examination of vegetation, soils, and hydrology. Areas meeting the criteria

set forth in the Regional Supplement were determined to be wetland. Soil, vegetation, and hydrologic parameters were sampled at several locations along the wetland boundary to make the determination. Data points on-site were marked with yellow- and black-striped flags. We recorded data at three locations. The wetland boundary was then delineated with pink- and black-stripped flags (18 flags were used). The delineated wetland was then classified using the *Western Washington Wetland Rating System* (Washington State Department of Ecology [Ecology], Aug 2004, version 2).

The study area was also evaluated for streams. The ordinary high water mark (OHWM) was determined by examining the bed and bank physical characteristics and vegetation to ascertain the water elevation for mean annual floods, per the definition provided by the Washington State Department of Fish and Wildlife and WAC 173-22-030(5). Areas meeting the definition were determined to be the OHWM and flagged with blue- and white-striped flags. Only the left bank of Stream A was flagged (15 flags were used). Field observations were then used to classify this stream according to the Issaquah Municipal Code (IMC) 18.10.780(E).

Findings

The subject parcel is situated on a low-gradient slope (less than 5%) and drains from southwest to northeast into Stream A, which flows along the eastern boundary of the parcel. Water also enters the parcel via a stormwater culvert beneath Newport Way NW near the west parcel boundary. The stormwater sheet flows through a low grassy field eastward along the north half of the subject property towards Stream A. Grassy hummocks with shallow depressions and clusters of domestic orchard trees (*Pyrus spp.* and *Prunus spp.*) surrounded by Himalayan blackberry (*Rubus armeniacus*, FACU) dominate the upland areas. There is evidence of both natural and human disturbance. Soil mounds on the surface indicate the activity of burrowing animals such as moles; the grassy field is a remnant from historic mowing. Wetland A is located in the north portion of the parcel.

Wetland A is a slope and depressional wetland with palustrine emergent, palustrine scrub-shrub, and palustrine forested Cowardin vegetation classes present. Surface water enters the wetland via the stormwater culvert on the western boundary of the parcel and forms a seasonal flow into Stream A. There are also shallow depressions in the wetland that are seasonally filled with a combination of groundwater and surface water from the culvert discharge. Surface water was visible in some of the shallow depressions during the time of the field visit, as well as a high water table two inches below the surface and saturation to the surface in the soil pit dug within Wetland A (see DP-1). Vegetation consists mostly of reed canarygrass (*Phalaris arundinacea*, FACW), with a cluster of red alder trees (*Alnus rubra*, FAC), Douglas spiraea (*Spiraea douglasii*, FACW) and cluster rose (*Rosa pisocarpa*, FACW) in a shallow depression along the upper slope. Vegetation gradually transitions into Pacific willow (*Salix lucida*, FACW) and

Western crabapple (*Malus fusca*, FACW) along the stream; Himalayan blackberry encroaches into the wetland from the upland area to the south. The rooting zone soils are a dark (10YR 2/1) silty loam with organic material masking redoximorphic features from the surface to approximately 6 to 10 inches below the surface, followed by a mixed layer approximately 2- to 4- inches thick with redoximorphic concentrations in the matrix. Below the mixed soil layer is a fine sand layer with redoximorphic concentrations present.

The south half of the parcel is characterized by non-wetland. Several old domesticated apple (*Malus domestica*) and cherry trees (*Prunus avium*), in various states of declining health, are growing in this area, with patches of Himalayan blackberry brambles, mixed field grasses, and dandelion (*Taraxacum officinale*, FACU), growing in the understory. The gently sloping transition zone from wetland to non-wetland is somewhat gradual. Patches of soft rush (*Juncus effusus*, FACW) and creeping buttercup (*Ranunculus repens*, FAC) mix with dandelion and Himalayan blackberry. Soils appear to be jumbled just upslope of the wetland boundary; with some weak redoximorphic features below the rooting zone at DP-3 (see Delineation Figure). But no indication of wetland hydrology was detected at the two soil sampling locations upslope of the delineated wetland edge (DP-2 and DP-3). The soil was not saturated in the top 16 inches of the soil column there during the January 2015 site visit.

Stream A is a low-gradient ditched stream fed by a stormwater culvert along NW Juniper Street. It also receives surface water from Wetland A and sheet flow from the upland area of the subject parcel. The stream is in the form of a drainage ditch constructed before 1920. Areas bordering the ditch near the subject parcel were previously under cultivation, including Wetland A. Stream A flows from south to north and eventually connects through several culverts, a public storm drain, and daylight channels to Tibbetts Creek, then into Lake Sammamish. There is no known fish passage or fish habitat along Stream A (WDFW PHS and WDFW Salmonscape, 2015).

Local Regulations

The subject parcel is regulated for streams and wetlands under IMC Chapter 18.10, Environmental Protection. The City of Issaquah uses the *Western Washington Wetland Rating System* (Ecology, Aug 2004, version 2) to classify wetlands (IMC 18.10.620), and the guidelines set forth in IMC 18.10.780 to classify streams.

Wetland A is a Category III wetland with a habitat function score of 17. Category III wetlands with habitat function scores less than 21 points have a standard buffer width of 50 feet (IMC 18.10.640(C)). Standard wetland buffers may be modified through buffer vegetation enhancement (IMC 18.10.650(D)(3)) or through buffer averaging (IMC 18.10.650(D)(5)). Under either administrative buffer modification option, the "…total buffer reduction shall not exceed twenty-five percent of the required wetland buffer area

or encroach into the buffer at any location by more than twenty-five percent of the standard wetland buffer width…"(IMC 18.10.650(D)(1)). A critical area study would be required for either buffer modification option to ensure no net loss of ecological function (IMC 18.10.650(D)(3)(c)).

Stream A is a Class 4 stream (IMC 18.10.780(E)). Class 4 streams have a 25-foot standard buffer, measured from the OHWM (IMC 18.10.785(A) & (C)(5)). Class 4 standard stream buffers may be administratively modified using reduction with enhancement (IMC 18.10.790(D)(4)) or through buffer averaging (IMC 18.10.790(D)(6)). Similar to the wetland buffers, the "…total stream buffer reduction shall not exceed twenty-five percent of the required stream buffer area or encroach into the buffer at any location by more than twenty-five percent of the standard stream buffer" (IMC 18.10.790(D)(1)). A critical area study would be required for either option (IMC 18.10.790(D)(4) & (6)).

Both streams and wetlands also require a 15-foot building setback established from the outer edge of the critical area buffer (IMC 18.10.515(D)). Some minor structural intrusions, including patios and low decks, are allowed within the setback area.

State and Federal Regulations

Wetlands and streams are also regulated by the Corps under Section 404 of the Clean Water Act and by WDFW under the Hydraulic Code.

Any filling of waters of the U.S., including wetlands (except isolated wetlands), would require notification and a permit from the Corps. Wetland A would likely not be considered isolated, and thus would be regulated federally. A formal isolated status inquiry can be requested from the Corps through the Jurisdictional Determination process. Federally permitted actions that could affect endangered species (e.g. salmon, bull trout) may also require a biological assessment study and consultation with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service. Application for Corps permits may also require an individual 401 Water Quality Certification and Coastal Zone Management Consistency determination from Ecology.

The Hydraulic Code, Chapter 77.55 RCW, gives WDFW the authority to review, condition, and approve or deny "any construction activity that will use, divert, obstruct, or change the bed or flow of State waters." In general, the Corps, WDFW and Ecology do not regulate wetland or stream buffers, unless direct impacts are proposed. When direct impacts are proposed, mitigation may be required to employ buffers based on Corps and Ecology joint regulatory guidance.

Disclaimer

The information contained in this document is based on the application of technical guidelines currently accepted as the best available science and in conjunction with the manuals and criteria outlined in the methods section. All discussions, conclusions and recommendations reflect the best professional judgment of the author(s) and are based upon information available to us at the time the study was conducted. All work was completed within the constraints of budget, scope, and timing. The findings of this report are subject to verification and agreement by the appropriate local, State and Federal regulatory authorities. No other warranty, expressed or implied, is made.

Please call if you have any questions or if we can provide you with any additional information.

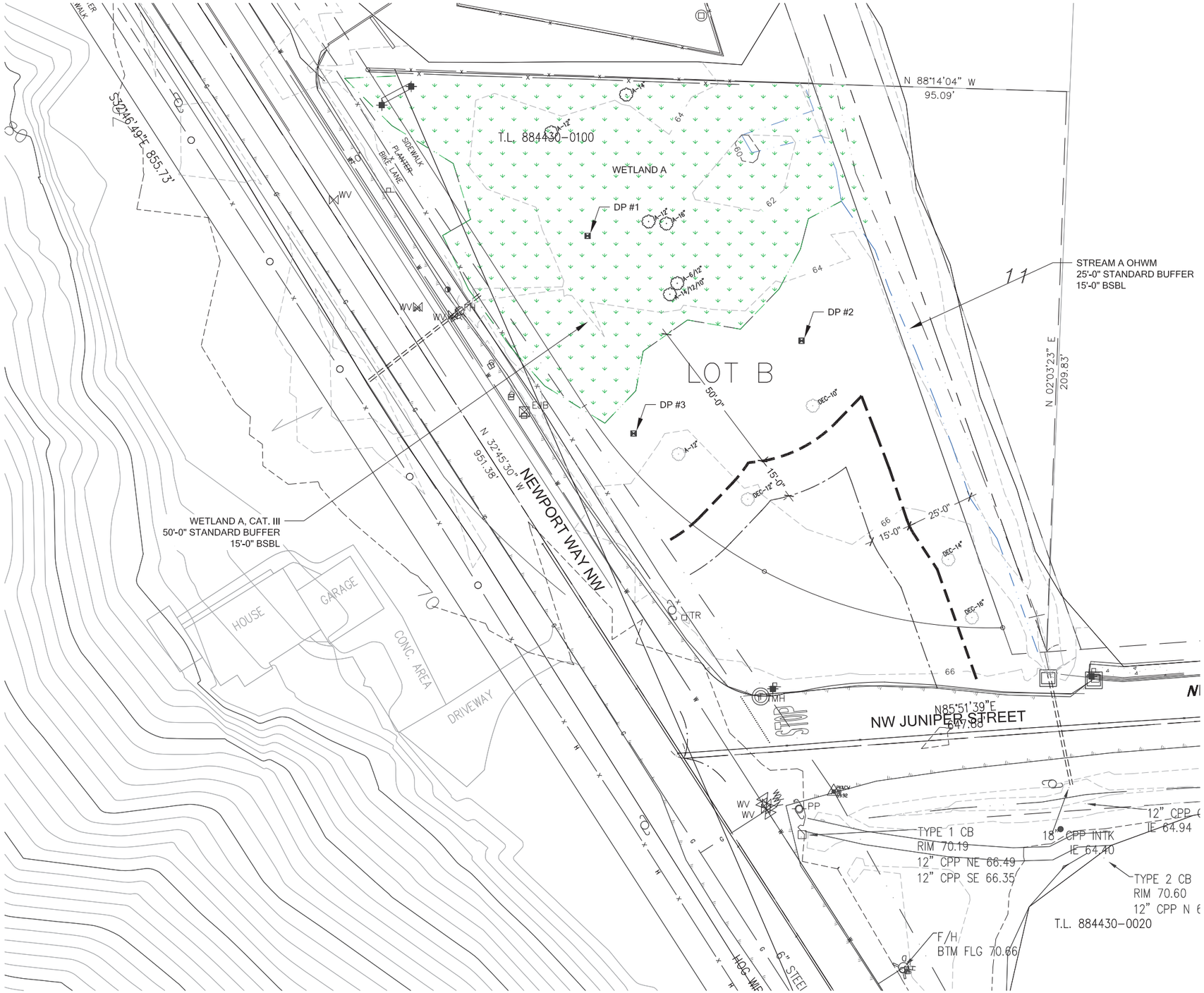
Sincerely,

Rose Whitson

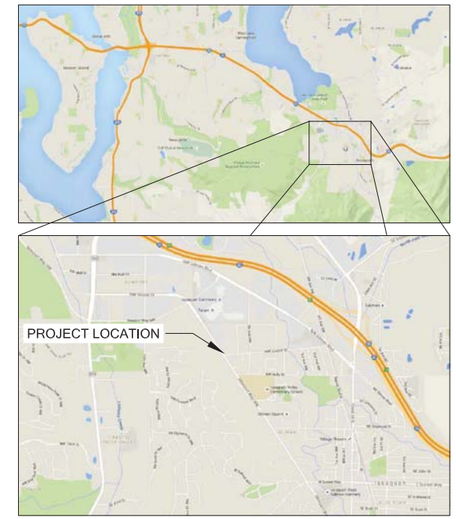
Rose Whitson, WPIT
Ecologist

Enclosures

INNESWOOD ESTATES WETLAND DELINEATION



DELINEATION MAP



VICINITY MAPS

LEGEND

- DELINEATED WETLAND BOUNDARY
- DELINEATED STREAM OHWM
- WETLAND & STREAM BUFFER
- WETLAND & STREAM BSBL
- DATA POINT

NOTES

1. CRITICAL AREAS DELINEATED BY THE WATERSHED COMPANY ON JANUARY 27, 2015.
2. SURVEY RECEIVED FROM MEAD GILMAN & ASSOC., WOODINVILLE, WA 98072, (425) 486-1252. FEBRUARY 2007 & FEBRUARY 2015.

20 10 0 20 40
SCALE IN FEET

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THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242
www.watershedco.com
Science & Design

INNESWOOD ESTATES
DELINEATION MAP
PREPARED FOR INNESWOOD ESTATES, LLC
PROJECT LOCATION:
798 NW JUNIPER ST., PARCEL # 8844300100
ISSAQUAH, WA 98027

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	09-17-15	DELINEATION MAP	MSF

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: HM
DESIGNED: HM,MSF
DRAFTED: MSF
CHECKED: HM
JOB NUMBER:
141207
SHEET NUMBER:
W1 OF 1

DATE: 9/17/2015 PRINTED BY: MARINA FRENCH FILENAME: TWC-141207-MIT.DWG

THE WATERSHED COMPANY

WETLAND DETERMINATION DATA FORM

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

DP-1

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

Project Site:	**Issaquah Inneswood – Abossein Property**	Sampling Date:	**1/27/2015**
Applicant/Owner:	**Bob Wenzl, Inneswood Estates, LLC**	Sampling Point:	DP- **1**
Investigator:	**Mike Foster; Rose Whitson**	City/County:	**Issaquah / King**
Sect., Township, Range:	S **28** T **24N** R **06E**	State:	**WA**

Landform (hillslope, terrace, etc): **depression** | Slope (%): **<5%** | Local relief (concave, convex, none): **concave**

Subregion (LRR): **A** | Lat: | Long: | Datum:

Soil Map Unit Name: **Kitsap silt loam, 15 to 30 percent slopes (KpD)** | NWI classification: **None listed**

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 the Sampling Point within a Wetland?**	Yes ☒ No ☐
Hydric Soils Present?	Yes ☒	No ☐		
Wetland Hydrology Present?	Yes ☒	No ☐		

Remarks: **Wetland A in-pit; between clump of alders and Newport Way NW in reed canarygrass field. Very high water table- near area of standing water. There is evidence of small rodent burrowing (clumps of dirt on surface), as well as a mixed matrix soil layer. The area was regularly mowed until recently.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Alnus rubra***	**10**	**Y**	**FAC**
2.			
3.			
4.			
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m diam.)			
1. ***Spiraea douglasii (nearby, not included)***			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 1m diam.)			
1. ***Phalaris arundinacea***	**98**	**Y**	**FACW**
2. ***Juncus effusus***	**2**	**N**	**FACW**
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum:			

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**2**	(A)
Total Number of Dominant Species Across All Strata:	**2**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index Worksheet

Total % Cover of		Multiply by
OBL species		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

- ☒ 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: Click here to enter text.

SOIL

Sampling Point – DP-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
0-10	**10YR 2/1**	**100**	**---**	**---**	**---**	**--**	**Silty loam**	**High org.**
10-13	**10YR 2/1** **2.5Y 4/1**	**50** **42**	**---** **10YR 4/6**	**---** **8**	**---** **C**	**---** **M**	**Silty loam** **Silty sand**	**Mixed matrix**
13-16	**2.5Y 4/1**	**93**	**10YR 4/6**	**7**	**C**	**M**	**Silty 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: _____

Depth (inches): _____

Hydric soil present? Yes ☒ No ☐

Remarks: **Organic concentrations masking redox in 0-10 layer**

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):	**2" BGS**
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (in):	**Surface**

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: **BGS = below ground surface**

THE WATERSHED COMPANY

WETLAND DETERMINATION DATA FORM

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

DP- 2

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

Project Site:	**Issaquah Inneswood – Abossein Property**	Sampling Date:	**1/27/2015**
Applicant/Owner:	**Bob Wenzl, Inneswood Estates, LCC**	Sampling Point:	DP- **2**
Investigator:	**Mike Foster; Rose Whitson**	City/County:	**Issaquah / King**
Sect., Township, Range:	S **28** T **24N** R **06E**	State:	**WA**
Landform (hillslope, terrace, etc): **terrace**	Slope (%): **0-1%**	Local relief (concave, convex, none): **none**	
Subregion (LRR): **A**	Lat:	Long:	Datum:
Soil Map Unit Name: **Briscot Silt Loam (Br)**		NWI classification: **None listed**	

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 the Sampling Point within a Wetland?** Yes ☐ No ☒
Hydric Soils Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks: **There is evidence of small rodent burrowing (clumps of dirt on surface), as well as a mixed matrix soil layer. The area was regularly mowed until recently.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***None****			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m diam.)			
1. ***None***			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 1m diam.)			
1. ***Phalaris arundinacea***	**45**	**Y**	**FACW**
2. ***Ranunculus repens***	**10**	**N**	**FAC**
3. ***Juncus effusus***	**5**	**N**	**FACW**
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. ***Rubus armeniacus***	**15**	**Y**	**FACU**
2.			
	15	= Total Cover	
% Bare Ground in Herb Stratum:			

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**1**	(A)
Total Number of Dominant Species Across All Strata:	**2**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**50%**	(A/B)

Prevalence Index Worksheet

Total % Cover of		Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

- ☐ 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: Click here to enter text.

SOIL

Sampling Point – DP-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
0-11	**10YR 2/2**	**100**	**---**	**---**	**---**	**---**	**Loam**	
11-13.5	**10YR 2/2**	**95**	**10YR 3/6**	**5**	**C**	**M**	**Sandy loam**	
13.5-16	**2.5Y 5/1**	**60**	**10YR 4/6**	**40**	**C**	**M**	**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: _____

Depth (inches): _____

Hydric soil present? Yes ☐ No ☒

Remarks: **Some pockets of sand in upper 10 inches.**

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:

Remarks: Click here to enter text.

WETLAND DETERMINATION DATA FORM

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

DP- 3

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

Project Site:	**Issaquah Inneswood – Abossein Property**	Sampling Date:	**1/27/2015**
Applicant/Owner:	**Bob Wenzl, Inneswood Estates, LLC**	Sampling Point:	DP- **3**
Investigator:	**Mike Foster; Rose Whitson**	City/County:	**Issaquah / King**
Sect., Township, Range:	S **28** T **24N** R **06E**	State:	**WA**

Landform (hillslope, terrace, etc): **hillslope** | Slope (%): **2-5%** | Local relief (concave, convex, none): **concave**

Subregion (LRR): **A** | Lat: | Long: | Datum:

Soil Map Unit Name: **Briscot silt loam (Br)** | NWI classification: **None listed**

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 the Sampling Point within a Wetland?**	Yes ☐ No ☒
Hydric Soils Present?	Yes ☒	No ☐		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Out-pit near the line. Soils appear jumbled. There is evidence of small rodent burrowing (clumps of dirt on surface), as well as a mixed matrix soil layer. The area was regularly mowed until recently.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Cherry (cultivated, rooted out)***			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m diam.)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 1m diam.)			
1. ***Phalaris arundinacea***	**50**	**Y**	**FACW**
2. ***Juncus effusus***	**20**	**Y**	**FACW**
3. ***Taraxacum officinale***	**1**	**N**	**FACU**
4. ***Cirsium vulgare***	**20**	**Y**	**FAC**
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	91	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. ***Rubus armeniacus***	**15**	**Y**	**FACU**
2.			
	15	= 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:	**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

- ☒ 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: **moss**

SOIL

Sampling Point – DP-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
0-6	**10YR 2/1**	**100**	**---**	**---**	**---**	**---**	**Loam**	
6-14	**10YR 2/1 2.5Y 6/1**	**60 20**	**7.5YR 4/6**	**20**	**C**	**M**	**Sandy loam**	**See below**
14-16	**2.5Y 5/1**	**60**	**7.5YR 4/6**	**40**	**C**	**M, PL**	**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: _____

Depth (inches): _____

Hydric soil present? Yes ☒ No ☐

Remarks: **Mixed matrix in mid-layer; redox starts in 2.5Y 6/1 and diffuses out to the other matrix color; 2.5Y 6/1 matrix has more sand.**

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:

Remarks: **Oxidized rhizospheres present in bottom layer, below top 12 inches. Pit moist, but no saturation at 16" below ground surface in January**

Wetland name or number: A_

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): **Wetland A – Abbosein Property** Date of site visit: **1/27/2015**

Rated by: **Mike Foster**, Rose Whitson Trained by ECY **Yes** ☒ No ☐ Date of Training **June 2008**

SEC: **28** TWNSHP: **24N** RNGE: **06E** Is S/T/R in Appendix D? Yes ☐ **No** ☒

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ☐ **II** ☐ **III** ☒ **IV** ☐

Category I = Score ≥70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	**14**
Score for Hydrologic Functions	**16**
Score for Habitat Functions	**17**
TOTAL score for functions	**47**

Category based on SPECIAL CHARACTERISTICS of wetland

I ☐ **II** ☐ **Does not Apply** ☒

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

III

Check the appropriate type and class of wetland being rated.

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

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

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

***The study area was reviewed for the presence of endangered, threatened, and priority species using WDFW online Priority Habitat and Species Data, PHS on the Web (http://wdfw.wa.gov/mapping/phs/).**

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

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

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the wetland unit usually controlled by tides (i.e. except during floods)?

☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit

☒ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

☐ At least 30% of the open water area is deeper than 6.6 ft (2 m)?

☒NO – go to 4 ☐**YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?

☒ The wetland is on a slope (*slope can be very gradual*),

☒ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, **<u>as sheetflow, or in a swale without distinct banks</u>**.

☐ The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).***<u>Ponds in stream, shallow depressions are a little larger than 3ft diameter</u>**

☒ NO – go to 5 ☐ **YES –** The wetland class is **Slope**

5. Does the entire wetland unit **meet all** of the following criteria?

☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river.

☐ The overbank flooding occurs at least once every two years

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

☒ NO - go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☒ NO – go to 7 ☐ **YES –** The wetland class is **Depressional**

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

☒ NO – go to 8 ☐ **YES –** The wetland class is **Depressional**

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

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

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

Wetland name or number: A_

D	Depressional and Flats Wetlands	Points
	WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	
D	**D 1. Does the wetland have the <u>potential</u> to improve water quality?**	***(see p. 38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 Unit has an intermittently flowing, or **<u>highly constricted permanently flowing outlet</u>** . points = 2 Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* . points = 1 Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet**, and/or outlet is a man-made ditch ..... points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*)	**2**
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*). YES points = 4 NO points = 0	**0**
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): Wetland has persistent, ungrazed, vegetation > = 95% of area ..... points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area ..... points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area ..... points = 0	**5**
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland ..... points = 4 Area seasonally ponded is > ¼ total area of wetland ..... points = 2 Area seasonally ponded is < ¼ total area of wetland ..... points = 0 NOTE: *See text for indicators of seasonal and permanent inundation.*	**0**
D	**Total for D 1** *Add the points in the boxes above*	**7**
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface <u>water coming into the wetland</u> that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☒ **<u>Untreated stormwater discharges to wetland</u>** ☐ Tilled fields or orchards within 150 ft of wetland ☒ **<u>A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</u>** ☒ **<u>Residential, urban areas, golf courses are within 150 ft of wetland</u>** ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other_____ **YES** multiply score in D 1. **by 2** **NO** multiply score in D 1. **by 1**	***(see p. 44)*** multiplier **2**
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	**14**

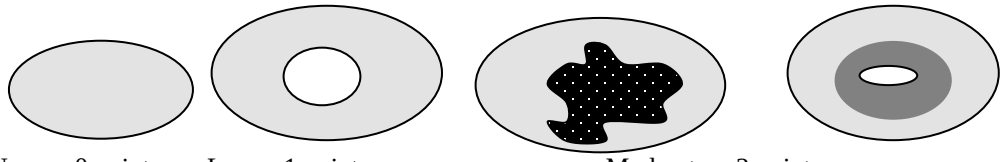
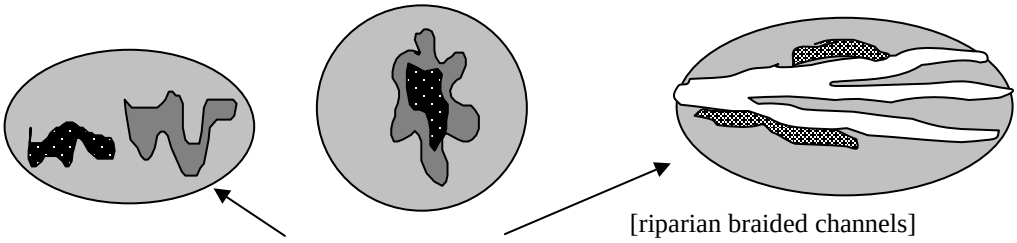
Wetland name or number: A_

D	Depresssional and Flats Wetlands	
	HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream degradation	
	D 3. Does the wetland have the <u>potential</u> to reduce flooding and erosion?	***(see p. 46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 **<u>Unit has an intermittently flowing, or highly constricted permanently flowing outlet</u>** points = 2 Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet**, and/or outlet is a man-made ditch ..... points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) . points = 0	**2**
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are at least 3 ft or more above the surface or bottom of outlet ..... points = 7 The wetland is a "headwater" wetland"..... points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet ..... points = 5 **<u>Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet</u>**..... points = 3 Unit is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water..... points = 1 Marks of ponding less than 0.5 ft ..... points = 0	**3**
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of the unit..... points = 5 **<u>The area of the basin is 10 to 100 times the area of the unit</u>** ..... points = 3 The area of the basin is more than 100 times the area of the unit..... points = 0 Entire unit is in the FLATS class..... points = 5	**3**
D	**Total for D 3** *Add the points in the boxes above*	**8**
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following conditions apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☐ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	*(see p. 49)* multiplier **2**
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**16**

Wetland name or number: A_

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat**	
H 1. Does the wetland have the potential to provide habitat for many species?	
H 1.1 Vegetation structure ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin) if the class is ¼ acre or covers more than 10% of the area of the wetland if unit smaller than 2.5 acres.* ☐ Aquatic bed ☒ Emergent plants ☒ Scrub/shrub (areas where shrubs have >30% cover) ☒ Forested (areas where trees have >30% cover) ☐ Forested areas have 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation types that qualify. If you have:* 4 structures or more .....points = 4 **3 structures** .....points = 2 2 structures.....points = 1 1 structure.....points = 0	**2**
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ☐ Permanently flooded or inundated — 4 or more types present .....points = 3 ☒ Seasonally flooded or inundated — **3 types present**.....points = 2 ☐ Occasionally flooded or inundated — 2 types present .....points = 1 ☒ Saturated only — 1 types present…….points = 0 ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☒ Seasonally flowing stream in, or adjacent to, the wetland ☐ ***Lake-fringe wetland* = 2 points** ☐ ***Freshwater tidal wetland* = 2 points**	**2**
H 1.3. Richness of Plant Species ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle* If you counted: > 19 species .....points = 2 *List species below if you want to:* **5 - 19 species** .....points = 1 < 5 species.....points = 0 ALRU, JUEF, HBB, SPDO, MAFU, SALU, etc	**1**

Wetland name or number: A_

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points  [riparian braided channels] **High** = 3 points NOTE: If you have four or more vegetation types or three vegetation types and open water the rating is always "high".	**3**
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☒ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ☒ Standing snags (diameter at the bottom > 4 inches) in the wetland ☒ Undercut banks are present for at least 6.6 ft (2m) and/or **overhanging vegetation extends at least 3.3 ft (1m) over a stream for at least 33 ft (10m)** ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present ☐ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *Note: The 20% stated in early printings of the manual on page 78 is an error.*	**3**
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	**11**

Wetland name or number: A_

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

Wetland name or number: A_

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

Wetland name or number: A_

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.....points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile.....points = 5 **There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed** .....points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile.....points = 3 There is at least 1 wetland within ½ mile.....points = 2 There are no wetlands within ½ mile. .....points = 0	**3**
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	**6**
TOTAL for H1 from page 14	**11**
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**17**

Wetland name or number: A_

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands (*see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 **NO** ☒	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-151? ☐ YES = Category I ☐ NO = go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native Spartina spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II) The are aof Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed wetland. ☐ The wetland has at least 2 or the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D ☒ or accessed from WNHP/DNR web site ☐ YES ☐ – contact WNHP/DNR (see p. 79) and go to SC 2.2 **<u>NO</u>** ☒ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ☐ Not a Heritage Wetland	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog. If you answer yes, you will still need to rate the wetland based on its functions.* 1. Does the wetland have organic soils horizons (i.e. layers of organic soil), either peats or mucks, that compose 16" or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils.) Yes - go to Q.3 **<u>NO - go to Q.2</u>** 2. Does the wetland have organic soils, either peats or mucks, that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes - go to Q.3 **<u>NO ☒ is not a bog for purpose of rating</u>** 3. Does the wetland have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists species in Table 3)? Yes – Is a bog for purpose of rating NO - go to Q.4 *NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.* 4. Is the wetland forested (>30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (*>30% coverage of the total shrub/herbaceous* cover)? YES = Category I NO ☐ is not a bog for purpose of rating	**Cat. I**

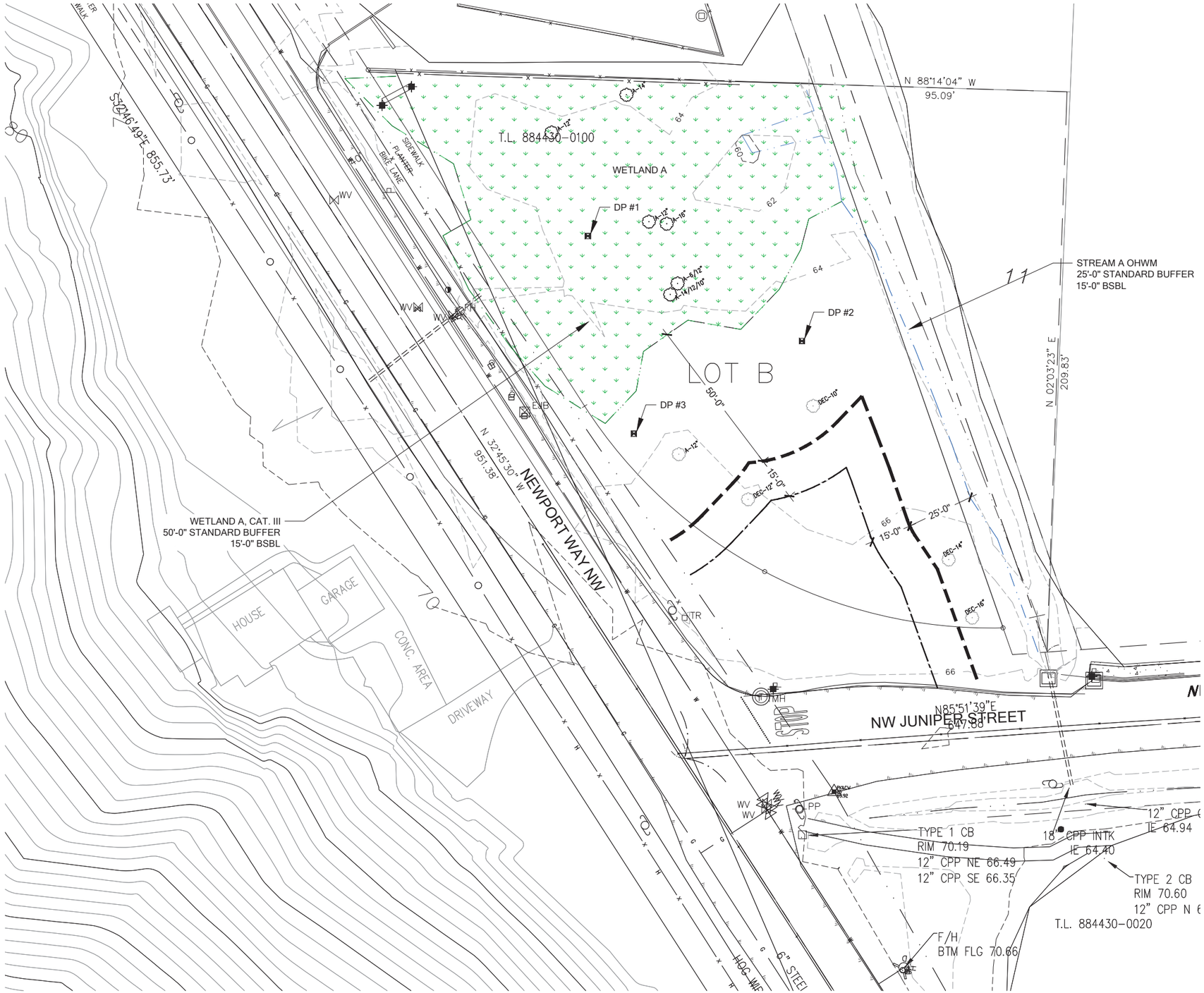
SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* ☐ Old growth forests: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. *Note: The criterion for dbh is based on measurements for upland forests. Two hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter.* ☐ Mature forests: (west of the Cascade crest) Stands where the largest trees are 80-200 years old OR have average diameters (dbh) exceeding 21 in (53 cm); crown cover may b less than 100%; decay, decadence, numbers of snags, and quanitity of large downed material is generally less than that found in old-growth. YES = Category 1 **<u>NO ☒ not a forested wetland with special characteristics</u>**	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons (see p. 91) Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks. ☐ The lagoon in which the wetland is located contains surgace water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*) YES – Go to SC 5.1 **<u>NO ☒ not a wetland in a coastal lagoon</u>** SC 5.1 Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetalnd is larger than 1/10 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

SC 6.0 Interdunal Wetlands (see p. 93) Is the wetalnd unit west of the 1889 line (also called the Westarn Boundary of Upland Ownership or WBUO)? YES – go to SC 6.1 NO ☒ **<u>not an interdunal wetland for rating</u>** *If you answer yes you will still need to rate the wetland based on its functions.* In practical terms that means the following geographic areas: – Long Beach Peninsula – lands west of SR 103 – Grayland-Westport – lands west of SR 105 – Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland 1 acre or larger, or is it in a mosaic of wetlands that is 1 acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. II** **Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categorie, and record on p. 1 .* If you answered NO for all types enter "Not Applicable" on p.1.	**N/A**

APPENDIX B.

PROJECT PLANS

INNESWOOD ESTATES



EXISTING CONDITIONS

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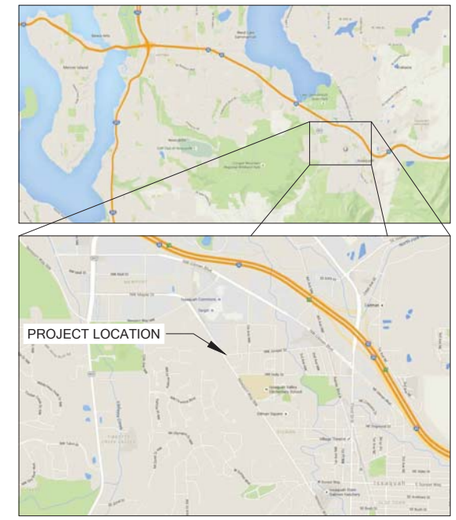
SCALE IN FEET



VICINITY MAPS

LEGEND

- DELINEATED WETLAND BOUNDARY
- DELINEATED STREAM OHWM
- WETLAND & STREAM BUFFER
- WETLAND & STREAM BSBL
- DATA POINT

SHEET INDEX

1 EXISTING CONDITIONS
2 MITIGATION PLAN
3 PLANTING AREA PREP PLAN
4 MITIGATION PLANTING PLAN
5 PLANT INSTALLATION DETAILS AND NOTES
6 MITIGATION PLAN NOTES

NOTES

1. CRITICAL AREAS DELINEATED BY THE WATERSHED COMPANY ON JANUARY 27, 2015.
2. SURVEY RECEIVED FROM MEAD GILMAN & ASSOC., WOODINVILLE, WA 98072, (425) 486-1252. FEBRUARY 2007 & FEBRUARY 2015.

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INNESWOOD ESTATES
STORMWATER VAULT MITIGATION PLAN
PREPARED FOR INNESWOOD ESTATES, LLC
PROJECT LOCATION:
798 NW JUNIPER ST., PARCEL # 8844300100
ISSAQUAH, WA 98027

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	09-17-15	STORMWATER VAULT MITIGATION PLAN	MSF
2	05-10-16	SITE DEVELOPMENT PERMIT SET	LV

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: HM
DESIGNED: HM,MSF
DRAFTED: MSF
CHECKED: HM
JOB NUMBER:
141207
SHEET NUMBER:
W1 OF 6

DATE: 5/9/2016
PRINTED BY: LUCAS VANNICE
FILENAME: TWC-141207-MIT.DWG

MITIGATION PLAN

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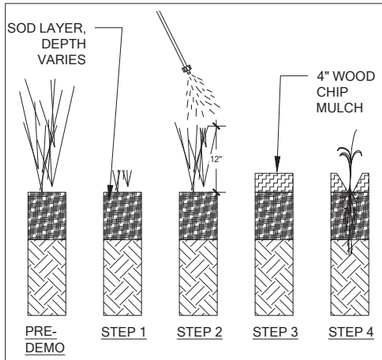


PLANTING AREA PREPARATION

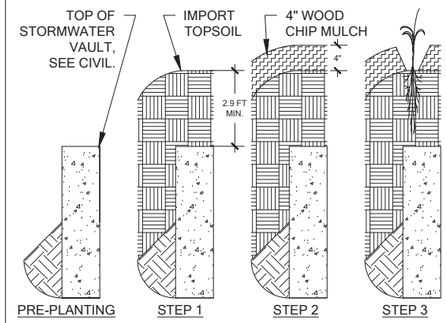
STEP 1
CUT OR MOW RCG. DURING GROWING SEASON. REMOVE CLIPPINGS OFFSITE.

STEP 2
ALLOW RCG TO GROW TO APPROX. TWELVE (12) INCH HEIGHT (AFTER MIN. TWO WEEKS) THEN APPLY AQUATICALLY CERTIFIED GLYPHOSATE.

STEP 3
REMOVE SOD/DUFF LAYER IF DEEMED FEASIBLE BY RESTORATION CONSULTANT. INSTALL WOOD CHIP MULCH 4" DEEP. (SEE PLANTING DETAIL.)

STEP 4
INSTALL PLANTS. (SEE PLANTING DETAIL.)

WETLAND AREA SOIL PREP SEQUENCE OF WORK



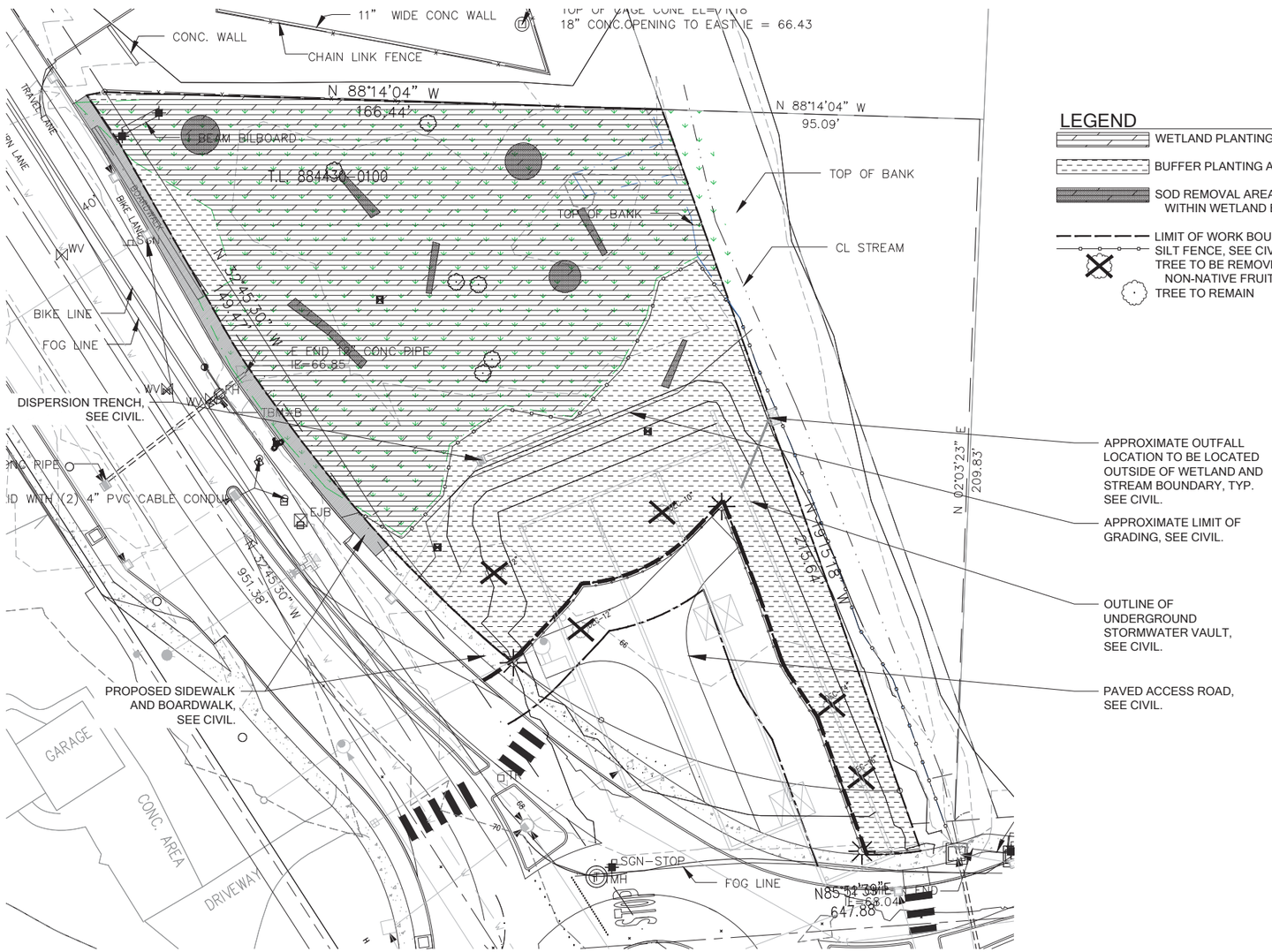
PLANTING AREA PREPARATION

STEP 1
PLACE IMPORT TOPSOIL.

STEP 2
INSTALL WOOD CHIP MULCH 4" DEEP. (SEE PLANTING DETAIL.)

STEP 3
INSTALL PLANTS. (SEE PLANTING DETAIL.)

BUFFER AREA SOIL PREP SEQUENCE OF WORK



LEGEND

- WETLAND PLANTING AREA
- BUFFER PLANTING AREA
- SOD REMOVAL AREA, DO NOT EXCAVATE WITHIN WETLAND BOUNDARY
- LIMIT OF WORK BOUNDARY
- SILT FENCE, SEE CIVIL
- TREE TO BE REMOVED, MOSTLY NON-NATIVE FRUIT TREES
- TREE TO REMAIN

PLANTING AREA PREP PLAN

20 10 0 20 40
SCALE IN FEET

DEMO & TESC NOTES

SEE CIVIL FOR TESC PLAN

CONSTRUCTION ACCESS

LIMIT ACCESS POINTS TO THE CRITICAL AREA. CONSULT WITH RESTORATION CONSULTANT TO ESTABLISH APPROPRIATE STAGING AREAS. CONSTRUCTION ACCESS OR STAGING SHALL AVOID AND/OR MINIMIZE DAMAGE TO EXISTING PLANTS AND THEIR ROOTS TO REMAIN TO THE GREATEST DEGREE POSSIBLE. UPON COMPLETION, ACCESS AND STAGING AREAS SHALL BE RESTORED TO ORIGINAL CONDITION. SEE PLANTING PLAN AND SOIL PREP SEQUENCE OF WORK.

IF CRITICAL AREA IS OVERCLEARED, EXTEND PLANTING AREA AND REPLICATE PLANTING AREA PLAN AND PREP.

GENERAL SOIL PREPARATION FOLLOWING DEMO WORK

AFTER REMOVAL OF NON-NATIVE MATERIAL AND ROUGH GRADING HAS OCCURRED, REPLACE ANY SOIL LOST THROUGH DEBRIS REMOVAL WITH TOPSOIL SO THAT GRADES ARE CONSISTENT WITH ADJACENT AREAS AND THERE ARE NO DIVOTS.

NOXIOUS WEED REMOVAL AND CONTROL NOTES

REMOVE REED CANARY GRASS (RCG) FROM PLANTING AREA.

1. REMOVE EXISTING PLANTS: MOW OR CUT DURING GROWING SEASON USING AN APPROPRIATE TOOL FOR THE INFESTATION LOCATION AND SIZE (MOWERS, BRUSH CUTTERS, LINE TRIMMERS, TRACTOR-DRAWN MOWERS, ETC). DO NOT DAMAGE NATIVE PLANTS TO REMAIN.
   - CLEAN TOOLS AND MACHINERY AFTER USE TO MINIMIZE RISK OF SPREAD.
   - ALWAYS DISPOSE OF REMOVED MATERIAL PROPERLY.
2. WHEN GRASS HAS REACHED ONE TO TWO FEET IN HEIGHT AFTER A MINIMUM OF TWO WEEKS, APPLY CHEMICAL CONTROL. IF POSSIBLE, DO THIS PROCESS IN EARLY SPRING-SUMMER, THEN REPEAT MOW AND SPRAY IN LATE FALL PRIOR TO PLANTING.
3. EVALUATE DUFF LAYER WITH RESTORATION CONSULTANT AND EVALUATE FEASIBILITY OF REMOVAL PRIOR TO PLANTING.
4. REVEGETATE: PLANT PER PLANTING PLAN. COVER WITH MINIMUM FOUR INCHES OF WOOD CHIP MULCH.
5. MONITORING AND MAINTENANCE: MONITOR AND SPOT CONTROL REINVASION FOR SEVERAL SEASONS UNTIL TREES AND SHRUBS ARE LARGE ENOUGH TO COMPETE WITH RCG. HEAVY MULCHING MUST BE MAINTAINED AT A MINIMUM OF FOUR INCHES.

REMOVE HIMALYAN OR EVERGREEN BLACKBERRY FROM PLANTING AREA.

1. CUT ABOVE GROUND PORTION OF BLACKBERRY AND REMOVE OFFSITE. ENSURE THAT NO NATIVE PLANTS ARE REMOVED.
2. CANES SHALL BE REMOVED FROM CANOPY OF TREES TO REMAIN TO THE EXTENT FEASIBLE AS DETERMINED BY THE RESTORATION CONSULTANT.
3. DIG UP OR PULL THE REMAINING ROOT BALL. ENSURE THAT NO NATIVE PLANT ROOTS ARE DAMAGED.
4. REPLACE ANY DIVOTS CREATED WHEN REMOVING THE PLANT TO LESSEN THE AMOUNT OF DISTURBED SOIL.
5. ALL CANES SHALL BE CUT BACK AND REMOVED WITHIN THE TEN (10) FEET ADJACENT TO THE PLANTING AREA, INCLUDING TREE CANOPY. CANES SHALL BE PULLED AND REMOVED OFF-SITE.
6. REVEGETATE PER PLANTING PLAN. COVER WITH WOOD CHIP MULCH FOUR INCHES DEEP.
7. MONITOR SITE THROUGHOUT GROWING SEASON FOR EMERGING CANES AND GRUB OUT AND REMOVE ANY NEW PLANTS. CONTINUE TO CUT BACK CANES TEN (10) FEET FROM THE PLANTING AREA.

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SCALE ACCORDINGLY.

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DESIGNED: HM,MSF
DRAFTED: MSF
CHECKED: HM
JOB NUMBER:
141207
SHEET NUMBER:
W3 OF 6

FILENAME: TWC-141207-MIT.DWG
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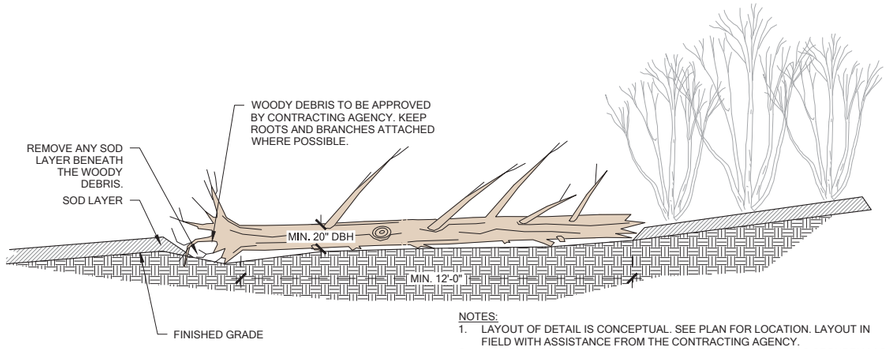
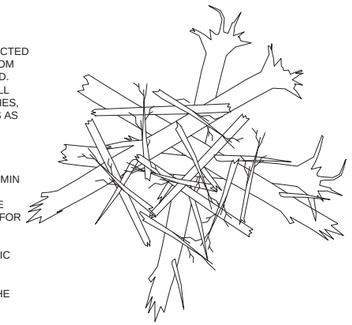


NOTES:
1. LAYOUT OF DETAIL IS CONCEPTUAL. SEE PLAN FOR LOCATION. LAYOUT IN FIELD WITH ASSISTANCE FROM THE CONTRACTING AGENCY.
2. WOODY DEBRIS SHALL BE TRIMMED AS NECESSARY TO SIT AS SECURELY AS POSSIBLE ON FINISHED GRADE. DO NOT EXCAVATE WITHIN THE WETLAND.
3. DOWNED WOOD SHALL BE MIN 20" DBH, MIN. TWELVE (12) FOOT LENGTH, NATIVE SPECIES, WITH CONIFEROUS SPECIES PREFERRED, OR, OTHER SIZE AND SPECIES APPROVED BY THE RESTORATION CONSULTANT.

1 WOODY DEBRIS DETAIL

Scale: NTS

NOTES:
1. DEBRIS PILES ARE TO BE CONSTRUCTED USING TRUNKS AND BRANCHES FROM ON-SITE TREES THAT ARE REMOVED.
2. MOUND PILES USING A MIX OF SMALL LOGS, SMALL ROOT WADS, BRANCHES, DUFF AND OTHER ORGANIC DEBRIS AS AVAILABLE.
3. DEBRIS PILE TO BE BUILT WITHOUT PLACING LOGS OR DEBRIS IN A NOTICEABLE PATTERN.
4. PILE SHOULD BE MIN. 6-8' DIA. AND MIN 3-4' HT.
5. PLENTY OF VOID SPACE SHOULD BE PRESENT WITHIN THE DEBRIS PILE FOR DENNING AND COVER.
6. DEBRIS PILES SHOULD BE FREE OF GARBAGE AND OTHER NON-ORGANIC MATERIALS.
7. PLACE DEBRIS PILES WITHIN THE MITIGATION AREA AS SHOWN ON THE PLAN.



2 SMALL WOODY DEBRIS PILE DETAIL

Scale: NTS

MITIGATION PLANTING PLAN

20 10 0 20 40
SCALE IN FEET

PLANT SCHEDULE

	BOTANICAL NAME / COMMON NAME	QTY.	SIZE
	TREES		
FL	FRAXINUS LATIFOLIA / OREGON ASH	13	2 GAL.
PS	PICEA SITCHENSIS / SITKA SPRUCE	18	2 GAL.
PT	POPULUS TRICHOCARPA / BLACK COTTONWOOD	15	2 GAL.
SL	SALIX LUCIDA / PACIFIC WILLOW	17	2 GAL.
SS	SALIX SITCHENSIS / SITKA WILLOW	15	2 GAL.
TP	THUJA PLICATA / WESTERN REDCEDAR	23	2 GAL.
	SMALL TREES		
BP	BETULA PAPYRIFERA / PAPER BIRCH	23	2 GAL.
ac	ACER CIRCINATUM / VINE MAPLE	25	1 GAL.
	SHRUBS		
cc	CORYLUS CORNUTA / BEAKED HAZELNUT	5	1 GAL.
cs	CORNUS SERICEA / RED-TWIG DOGWOOD	76	1 GAL.
hd	HOLODISCUS DISCOLOR / OCEANSPRAY	16	1 GAL.
l	LONICERA INVOLUCRATA / BLACK TWINBERRY	47	1 GAL.
ma	MAHONIA AQUIFOLIUM / TALL OREGON GRAPE	16	1 GAL.
pc	PHYSOCARPUS CAPITATUS / PACIFIC NINEBARK	82	1 GAL.
rs	RIBES SANGUINEUM / RED-FLOWERING CURRANT	53	1 GAL.
rp	ROSA PISOCARPA / CLUSTERED ROSE	151	1 GAL.
rn	ROSA NUTKANA / NOOTKA ROSE	172	1 GAL.
rup	RUBUS PARVIFOLIUS / THIMBLEBERRY	62	1 GAL.
rus	RUBUS SPECTABILIS / SALMONBERRY	33	1 GAL.
sa	SYMPHORICARPOS ALBUS / SNOWBERRY	60	1 GAL.
	PERENNIALS / GROUNDCOVER / FERNS		
	ATHYRIUM FILIX FEMINA / LADY FERN	50	1 GAL. @ 24" O.C. PLANT IN SAME SPECIES GROUPINGS OF MIN. 5, MAX. 9
	CAREX UTRICULATA / BEAKED SEDGE	50	
	JUNCUS TENUIS / SLENDER RUSH	50	
	JUNCUS ENSIFOLIUS / DAGGER LEAF RUSH	50	
	GAULTHERIA SHALLON / SALAL	115	1 GAL. @ 24" O.C. PLANT IN SAME SPECIES GROUPINGS OF MIN. 5, MAX. 9
	MAHONIA NERVOSA / LOW OREGON GRAPE	115	
	POLYSTICHUM MUNITUM / SWORD FERN	115	
	LIVE STAKES		
	CORNUS SERICEA / RED-TWIG DOGWOOD	15	12" O.C., USE TRIANGULAR SPACING
	SALIX SCOULERIANA / SCOULER'S WILLOW	145	18" O.C., USE TRIANGULAR SPACING

NOTE:
1. ENSURE THAT ALL EXISTING NATIVE TREES & SHRUBS ARE PRESERVED WITHIN THE PLANTING AREA.
2. DO NOT EXCAVATE WITHIN THE WETLAND.

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SCALE ACCORDINGLY.

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DESIGNED: HM,MSF
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CHECKED: HM
JOB NUMBER: 141207
SHEET NUMBER: W4 OF 6

DATE 5/0/2016 | PRINT BY LUCAS VANNICE | FILENAME TWC-141207-MIT.DWG

PLANT INSTALLATION SPECIFICATIONS

GENERAL NOTES

QUALITY ASSURANCE
1. PLANTS SHALL MEET OR EXCEED THE SPECIFICATIONS OF FEDERAL, STATE, AND LOCAL LAWS REQUIRING INSPECTION FOR PLANT DISEASE AND INSECT CONTROL.
2. PLANTS SHALL BE HEALTHY, VIGOROUS, AND WELL-FORMED, WITH WELL DEVELOPED, FIBROUS ROOT SYSTEMS, FREE FROM DEAD BRANCHES OR ROOTS. PLANTS SHALL BE FREE FROM DAMAGE CAUSED BY TEMPERATURE EXTREMES, LACK OR EXCESS OF MOISTURE, INSECTS, DISEASE, AND MECHANICAL INJURY. PLANTS IN LEAF SHALL BE WELL FOLIATED AND OF GOOD COLOR. PLANTS SHALL BE HABITUATED TO THE OUTDOOR ENVIRONMENTAL CONDITIONS INTO WHICH THEY WILL BE PLANTED (HARDENED-OFF).
3. TREES WITH DAMAGED, CROOKED, MULTIPLE OR BROKEN LEADERS WILL BE REJECTED. WOODY PLANTS WITH ABRASIONS OF THE BARK OR SUN SCALD WILL BE REJECTED.
4. NOMENCLATURE: PLANT NAMES SHALL CONFORM TO FLORA OF THE PACIFIC NORTHWEST BY HITCHCOCK AND CRONQUIST, UNIVERSITY OF WASHINGTON PRESS, 1973 AND/OR TO A FIELD GUIDE TO THE COMMON WETLAND PLANTS OF WESTERN WASHINGTON & NORTHWESTERN OREGON, ED. SARAH SPEAR COOKE, SEATTLE AUDUBON SOCIETY, 1997.

DEFINITIONS
1. PLANTS/PLANT MATERIALS. PLANTS AND PLANT MATERIALS SHALL INCLUDE ANY LIVE PLANT MATERIAL USED ON THE PROJECT. THIS INCLUDES BUT IS NOT LIMITED TO CONTAINER GROWN, B&B OR BAREROOT PLANTS; LIVE STAKES AND FASCINES (WATTLES); TUBERS, CORMS, BULBS, ETC..; SPRIGS, PLUGS, AND LINERS.
2. CONTAINER GROWN. CONTAINER GROWN PLANTS ARE THOSE WHOSE ROOTBALLS ARE ENCLOSED IN A POT OR BAG IN WHICH THAT PLANT GREW.

SUBSTITUTIONS
1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN SPECIFIED MATERIALS IN ADVANCE IF SPECIAL GROWING, MARKETING OR OTHER ARRANGEMENTS MUST BE MADE IN ORDER TO SUPPLY SPECIFIED MATERIALS.
2. SUBSTITUTION OF PLANT MATERIALS NOT ON THE PROJECT LIST WILL NOT BE PERMITTED UNLESS AUTHORIZED IN WRITING BY THE RESTORATION CONSULTANT.
3. IF PROOF IS SUBMITTED THAT ANY PLANT MATERIAL SPECIFIED IS NOT OBTAINABLE, A PROPOSAL WILL BE CONSIDERED FOR USE OF THE NEAREST EQUIVALENT SIZE OR ALTERNATIVE SPECIES, WITH CORRESPONDING ADJUSTMENT OF CONTRACT PRICE.
4. SUCH PROOF WILL BE SUBSTANTIATED AND SUBMITTED IN WRITING TO THE CONSULTANT AT LEAST 30 DAYS PRIOR TO START OF WORK UNDER THIS SECTION.

INSPECTION
1. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE RESTORATION CONSULTANT FOR CONFORMANCE TO SPECIFICATIONS, EITHER AT TIME OF DELIVERY ON-SITE OR AT THE GROWER'S NURSERY. APPROVAL OF PLANT MATERIALS AT ANY TIME SHALL NOT IMPAIR THE SUBSEQUENT RIGHT OF INSPECTION AND REJECTION DURING PROGRESS OF THE WORK.
2. PLANTS INSPECTED ON SITE AND REJECTED FOR NOT MEETING SPECIFICATIONS MUST BE REMOVED IMMEDIATELY FROM SITE OR RED-TAGGED AND REMOVED AS SOON AS POSSIBLE.
3. THE RESTORATION CONSULTANT MAY ELECT TO INSPECT PLANT MATERIALS AT THE PLACE OF GROWTH. AFTER INSPECTION AND ACCEPTANCE, THE RESTORATION CONSULTANT MAY REQUIRE THE INSPECTED PLANTS BE LABELED AND RESERVED FOR PROJECT. SUBSTITUTION OF THESE PLANTS WITH OTHER INDIVIDUALS, EVEN OF THE SAME SPECIES AND SIZE, IS UNACCEPTABLE.

MEASUREMENT OF PLANTS
1. PLANTS SHALL CONFORM TO SIZES SPECIFIED UNLESS SUBSTITUTIONS ARE MADE AS OUTLINED IN THIS CONTRACT.
2. HEIGHT AND SPREAD DIMENSIONS SPECIFIED REFER TO MAIN BODY OF PLANT AND NOT BRANCH OR ROOT TIP TO TIP. PLANT DIMENSIONS SHALL BE MEASURED WHEN THEIR BRANCHES OR ROOTS ARE IN THEIR NORMAL POSITION.
3. WHERE A RANGE OF SIZE IS GIVEN, NO PLANT SHALL BE LESS THAN THE MINIMUM SIZE AND AT LEAST 50% OF THE PLANTS SHALL BE AS LARGE AS THE MEDIAN OF THE SIZE RANGE. (EXAMPLE: IF THE SIZE RANGE IS 12" TO 18", AT LEAST 50% OF PLANTS MUST BE 15" TALL.).

SUBMITTALS

PROPOSED PLANT SOURCES
1. WITHIN 45 DAYS AFTER AWARD OF THE CONTRACT, SUBMIT A COMPLETE LIST OF PLANT MATERIALS PROPOSED TO BE PROVIDED DEMONSTRATING CONFORMANCE WITH THE REQUIREMENTS SPECIFIED. INCLUDE THE NAMES AND ADDRESSES OF ALL GROWERS AND NURSERIES.

PRODUCT CERTIFICATES
1. PLANT MATERIALS LIST - SUBMIT DOCUMENTATION TO CONSULTANT AT LEAST 30 DAYS PRIOR TO START OF WORK UNDER THIS SECTION THAT PLANT MATERIALS HAVE BEEN ORDERED. ARRANGE PROCEDURE FOR INSPECTION OF PLANT MATERIAL WITH CONSULTANT AT TIME OF SUBMISSION.
2. HAVE COPIES OF VENDOR'S OR GROWERS' INVOICES OR PACKING SLIPS FOR ALL PLANTS ON SITE DURING INSTALLATION. INVOICE OR PACKING SLIP SHOULD LIST SPECIES BY SCIENTIFIC NAME, QUANTITY, AND DATE DELIVERED (AND GENETIC ORIGIN IF THAT INFORMATION WAS PREVIOUSLY REQUESTED).

DELIVERY, HANDLING, & STORAGE

NOTIFICATION
CONTRACTOR MUST NOTIFY CONSULTANT 48 HOURS OR MORE IN ADVANCE OF DELIVERIES SO THAT CONSULTANT MAY ARRANGE FOR INSPECTION.

PLANT MATERIALS
1. TRANSPORTATION - DURING SHIPPING, PLANTS SHALL BE PACKED TO PROVIDE PROTECTION AGAINST CLIMATE EXTREMES, BREAKAGE AND DRYING. PROPER VENTILATION AND PREVENTION OF DAMAGE TO BARK, BRANCHES, AND ROOT SYSTEMS MUST BE ENSURED.
2. SCHEDULING AND STORAGE - PLANTS SHALL BE DELIVERED AS CLOSE TO PLANTING AS POSSIBLE. PLANTS IN STORAGE MUST BE PROTECTED AGAINST ANY CONDITION THAT IS DETRIMENTAL TO THEIR CONTINUED HEALTH AND VIGOR.
3. HANDLING - PLANT MATERIALS SHALL NOT BE HANDLED BY THE TRUNK, LIMBS, OR FOLIAGE BUT ONLY BY THE CONTAINER, BALL, BOX, OR OTHER PROTECTIVE STRUCTURE, EXCEPT BAREROOT PLANTS SHALL BE KEPT IN BUNDLES UNTIL PLANTING AND THEN HANDLED CAREFULLY BY THE TRUNK OR STEM.
4. LABELS - PLANTS SHALL HAVE DURABLE, LEGIBLE LABELS STATING CORRECT SCIENTIFIC NAME AND SIZE. TEN PERCENT OF CONTAINER GROWN PLANTS IN INDIVIDUAL POTS SHALL BE LABELED. PLANTS SUPPLIED IN FLATS, RACKS, BOXES, BAGS, OR BUNDLES SHALL HAVE ONE LABEL PER GROUP.

WARRANTY

PLANT WARRANTY
PLANTS MUST BE GUARANTEED TO BE TRUE TO SCIENTIFIC NAME AND SPECIFIED SIZE, AND TO BE HEALTHY AND CAPABLE OF VIGOROUS GROWTH.

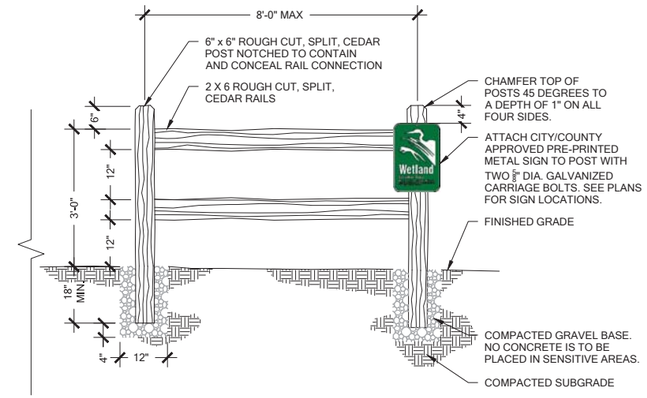
REPLACEMENT
1. PLANTS NOT FOUND MEETING ALL OF THE REQUIRED CONDITIONS MUST BE REMOVED FROM SITE AND REPLACED IMMEDIATELY AT THE CONSULTANT'S DISCRETION.
2. PLANTS NOT SURVIVING AFTER ONE YEAR TO BE REPLACED.

PLANT MATERIAL

GENERAL
1. PLANTS SHALL BE NURSERY GROWN IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICES UNDER CLIMATIC CONDITIONS SIMILAR TO OR MORE SEVERE THAN THOSE OF THE PROJECT SITE.
2. PLANTS SHALL BE TRUE TO SPECIES AND VARIETY OR SUBSPECIES. NO CULTIVARS OR NAMED VARIETIES SHALL BE USED UNLESS SPECIFIED AS SUCH.

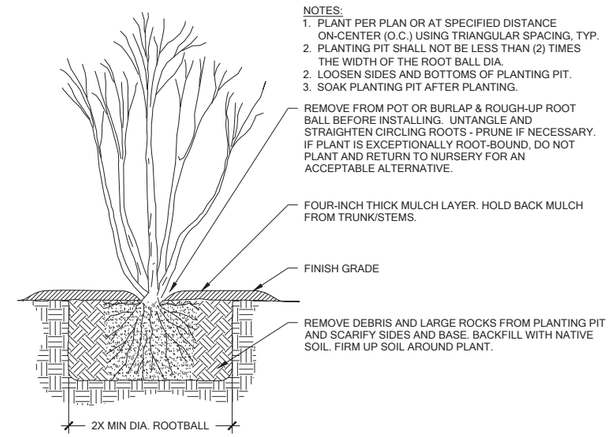
QUANTITIES
SEE PLANT LIST ON ACCOMPANYING PLANS AND PLANT SCHEDULES.

ROOT TREATMENT
1. CONTAINER GROWN PLANTS (INCLUDES PLUGS): PLANT ROOT BALLS MUST HOLD TOGETHER WHEN THE PLANT IS REMOVED FROM THE POT, EXCEPT THAT A SMALL AMOUNT OF LOOSE SOIL MAY BE ON THE TOP OF THE ROOTBALL.
2. PLANTS MUST NOT BE ROOT-BOUND; THERE MUST BE NO CIRCLING ROOTS PRESENT IN ANY PLANT INSPECTED.
3. ROOTBALLS THAT HAVE CRACKED OR BROKEN WHEN REMOVED FROM THE CONTAINER SHALL BE REJECTED.



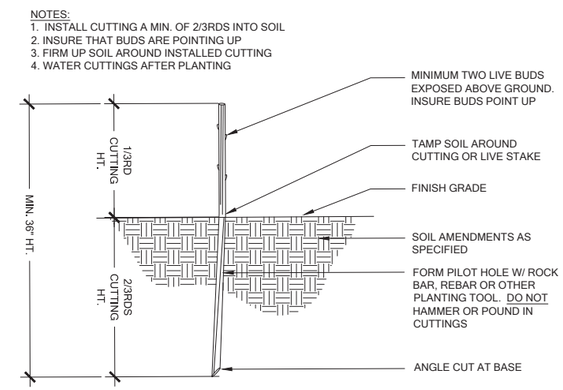
3 SPLIT-RAIL FENCE DETAIL

Scale: NTS



4 CONTAINER PLANTING DETAIL

Scale: NTS



5 LIVE STAKE PLANTING DETAIL

Scale: NTS

PLANT INSTALLATION DETAILS AND NOTES

SCALE AS NOTED

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750 Sixth Street South
Kirkland WA 98033
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Science & Design

INNESWOOD ESTATES
STORMWATER VAULT MITIGATION PLAN
PREPARED FOR INNESWOOD ESTATES, LLC
PROJECT LOCATION:
798 NW JUNIPER ST., PARCEL # 8844300100
ISSAQUAH, WA 98027

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	09-17-15	STORMWATER VAULT MITIGATION PLAN	MSF
2	05-10-16	SITE DEVELOPMENT PERMIT SET	LV

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: HM
DESIGNED: HM,MSF
DRAFTED: MSF
CHECKED: HM
JOB NUMBER:
141207
SHEET NUMBER:
W5 OF 6

FILENAME: TWC-141207-MIT.DWG
PRINTED BY: LUCAS VANNICE
DATE: 5/9/2016

INNESWOOD ESTATES WETLAND AND WETLAND BUFFER MITIGATION PLAN ON THE FORMER ABOSSEIN PROPERTY

Executive Summary

This plan seeks to enhance a low-functioning wetland and on-site wetland and stream buffer areas. The enhancement allows for the construction of a stormwater vault on the property as part of the development proposal for the Inneswood Estates apartment complex located across Newport Way to the west.

Wetland and Buffer Enhancement

A stormwater detention vault is proposed beneath the buffer of on-site wetland and stream areas. The vault will be situated below-grade with a minimum of 2.9 feet of imported topsoil and native woody vegetation installed above the vault. Outside the buffers, areas atop the vault will be landscaped as a park amenity under a separate plan. In addition to buffer enhancement, the wetland will also be improved over its current condition.

Restoration of the wetland and buffers would involve clearing non-native weeds, soil amendments, topsoil placement and installation of a diverse assemblage of native trees, shrubs and groundcovers. Woody debris salvaged from the proposed Inneswood Estates would be placed throughout as habitat logs and, small woody debris piles, or snagged in place where feasible. The overall goal of the enhancement would be to improve the water quality, wildlife habitat and hydrologic function of the natural areas retained on the site.

Goals and Objectives

1) Preserve the existing wetland from future impacts.

2) Enhance and restore wetland and wetland and stream buffer function in terms of habitat, water quality and hydrology.

Performance Standards

The standards listed below will be used to judge the success of the plan over time in meeting the Goals and Objectives outlined above. A monitoring and maintenance period will be implemented for five years following acceptance of the installed plan as approved by the City. If performance standards are not met by the end of year five, the monitoring and maintenance period may need to be extended until standards are achieved.

1) Survival:

a) 100% survival of all plantings at the end of Year One. This standard may be met through establishment of installed plants or by replanting as necessary to achieve the required numbers.

b) 80% survival of all plantings at the end of Year Two. This standard may be met through establishment of installed plants or by replanting as necessary to achieve the required numbers. Survival beyond Year Two is difficult to track. Therefore, a diversity standard is proposed in place of survival (see #3, below).

2) Native woody vegetation cover in densely planted areas:

a) Achieve 65% cover of native woody vegetation by the end of Year 3. Volunteer species may count towards this standard.

b) Achieve 80% cover of native woody vegetation by the end of Year 5. Volunteer species may count towards this standard.

3) Species diversity in planted areas:

a) Establish at least three native tree species and four native shrub species throughout the wetland area by Year 5. Volunteer species may count towards this standard.

b) Establish at least two native small tree species and four native shrub species throughout the buffer area by Year 5. Volunteer species may count towards this standard.

4) Invasive species standards in planted areas:

a) No more than 10% cover of invasive woody species in the planting area, in any monitoring year. Invasive species cover above 10% will trigger maintenance weeding.

b) Reed canarygrass monocultures shall not persist in the planting area during the monitoring period. Monocultures are defined as non-linear patches of reed canarygrass larger than 100 square feet that are absent of native vegetation.

5) Mitigation area protection:

a) Split rail fence shall be functional and intact with critical areas protection area signage for the duration of the monitoring period.

Monitoring Methods

This monitoring program is designed to track the success of the mitigation site over time by measuring the degree to which the performance standards listed above are being met.

An as-built plan will be prepared and submitted to the City for approval within 30 days of substantially complete construction of the mitigation area. The as-built plan will document substantial conformance with these plans and also will disclose any substitutions or other non-critical departures. The as-built plan will establish transects, baseline plant installation quantities, and photopoints that will be used throughout the monitoring period to measure the performance standards over time.

Transects

During the as-built inspection, the monitoring **restoration specialist** shall install at least four transects at least 50 feet in length throughout enhancement areas. Length of transects may vary and be limited by the shapes of planting areas.

Photopoints shall be established at either end of all transects or from other monuments (at least 10) to provide photographic documentation of site conditions. Areas outside the established transects will be visually monitored to verify that performance standards are being met.

Monitoring shall occur twice annually for five years. The first monitoring visit shall occur in the spring. This visit shall record necessary weeding, invasive weed control, and other maintenance needs. The **restoration specialist** will then notify the owner and/or maintenance crews of necessary early season maintenance. The second visit shall occur in late summer or fall and will record the following and provide an annual report to the City:

1) General summary of the spring visit.

2) First-year counts of surviving and dead/dying plants by species in the planting areas.

3) Estimates of native woody species cover along transects using the line intercept method.

4) Estimates of invasive woody species cover along transects using the line intercept method.

5) Counts of established native species to determine site diversity.

6) Notes and/or sketches of reed canarygrass monoculture areas. Monocultures are defined as non-linear patches of reed canarygrass larger than 100 square feet that are absent of native vegetation.

7) Photographic documentation from transects ends and established reference points.

8) Intrusions into the planting areas, vandalism, trash, and other actions detrimental to the overall health of the mitigation area.

9) Recommendations for maintenance in the mitigation area.

Construction Notes and Specifications

Work Sequence

Note: Specifications for items in **bold** can be found under "Material Specifications and Definitions."

The Watershed Company personnel, or other persons qualified to evaluate environmental restoration projects, shall monitor:

1) All site preparation.

a) Clearing

b) Woody debris placement

2) Plant material inspection

a) 50% plant installation/layout inspection.

b) 100% plant installation inspection.

3) Final walk through.

a) Wood chip mulch placement

b) Split-rail fence and critical area sign installation

General Work Sequence

1) Following stormwater vault installation (plans by others), verify adequate installation of topsoil atop and adjacent to the vault. **Topsoil** shall be placed to a sufficient depth in all graded areas intended for restoration planting.

2) Clear the remainder of the planting area of all invasive vegetation or treat as detailed on sheet W3. Do not clear, damage or remove existing native vegetation or non-native, non-invasive fruit and other trees.

3) All plant installation shall take place during the dormant season (October 15 - March 1).

4) Layout vegetation to be installed per the planting plan and plant schedule.

5) Prepare a planting pit for each plant and install per the planting details.

6) Blanket mulch planting area with **wood chip mulch**, four inches thick.

7) Install a temporary irrigation system capable of supplying two inches of water per week to all plants in the mitigation area from June 1 through September 30 for the first two years following installation.

8) Install the split rail fence and signage per plan details.

Maintenance

This site will be maintained for five years following completion of the construction. Specifications in **bold** can be found under "Material Specifications and Definitions."

1) Replace each plant found dead in the summer monitoring visit during the upcoming fall dormant season (October 15th to March 1st).

2) Follow the recommendations noted in the spring monitoring site visit.

3) Invasive species maintenance plan:

a) Invasive vegetation shall be grubbed out by hand on an ongoing basis, being careful to grub out roots except where such work will jeopardize the roots of installed native or volunteer native plants.

b) If hand removal proves unsuccessful or will damage desirable species, application of an herbicide approved for use in aquatic areas may be used. Herbicide applications must be conducted only by a state-licensed applicator. Applications should be done between mid-spring and mid-summer to maximize uptake by plants. Application should be a targeted method such as spot spray (preferred for Himalayan blackberry), wick, or stem injection (for Japanese knotweed).

c) Once per year, vines and thickets encroaching from outside of the planted area are to be cut back to at least ten feet from the planted area.

d) Control reed canarygrass monocultures identified in the annual monitoring reports or as directed by the **restoration specialist**. Control shall consist of mowing the monoculture to the ground, covering with cardboard, plus at least four inches of **woodchip mulch**. The mulched area is then planted densely with native woody species on tight spacing (maximum 4-feet on-center). Species and quantities to be determined by the **restoration specialist**.

4) At least twice-yearly, hand remove all competing weeds and weed roots from beneath each installed plant and any desirable volunteer vegetation to a distance of 18 inches from the main plant stem. Weeding should occur as needed during the spring and summer. Frequent weeding will result in lower mortality and lower plant replacement costs.

5) Do not weed the area near the plant bases with string trimmer (weed whacker). Native plants are easily damaged or killed, and weeds easily recover after trimming.

6) Apply slow release granular **fertilizer** to each installed plant annually in the spring (by June 1) of years two through five but not in year one.

7) Maintain a minimum four-inch thick mulch layer throughout the planting area.

8) The temporary irrigation system shall be operated to ensure that plants receive a minimum of two inches of water per week from June 1 through September 30 for the first two years following installation. Irrigation beyond the second year may be needed based on site performance or significant replanting.

9) Repair or replace buffer fencing and signage as needed to protect the site.

Material Specifications and Definitions

1) Topsoil: Topsoil shall be planting soil mix (Imported) and shall be Cedar Grove Planting Soil Mix or an approved equal. The Planting Soil Mix shall consist of 67% Sandy Loam and 33% Compost by volume. The Compost (Organic Amendment) component shall meet WSDOT standards. The Sandy Loam component shall consist largely of sand, but with enough silt and clay present to give it a small amount of stability and shall meet the following sieve analysis:

Screen Size	Percent Passing
3/8"	100
1/4"	95-100
#10	85-95
#30	60-75
#60	50-60
#100	10-20
#200	0-10

Soil shall have pH range of 5.5 - 7.5 with dolomite lime, sulfur or other amendments, added prior to delivery as necessary to attain this range.

2) Wood chip mulch: "Arborist chips" (chipped woody material) approximately one to three inches in maximum dimension (not sawdust or coarse hog fuel). This material is commonly available in large quantities from arborist or tree-pruning companies. This material is sold as "Animal Friendly Hog Fuel" at Pacific Topsoils [(800) 884-7645]. Mulch shall not contain appreciable quantities of garbage, plastic, metal, soil, and dimensional lumber or construction/demolition debris. Quantity required: 286 cubic yards.

3) Fertilizer: Slow release, granular fertilizer such as Osmocote™ or equal product. Most retail nurseries carry this product. Follow manufacturer's instructions for application. Keep fertilizer in a weather-tight container while on site. Note that fertilizer is to be applied only in years two, three, four and five and not in the first year.

4) Woody Debris: Large woody debris shall be minimum 20 inches dbh, minimum twelve foot length as measured from ground level, native species only, with coniferous species preferred, or other size and species approved by **Restoration specialist**. Roots and branches shall be kept intact where possible. Small woody debris piles shall use branches from on-site tree removal approved by **Restoration specialist**. See plan for detail and placement.

5) Restoration specialist: **Synonymous with Restoration Consultant.** The Watershed Company personnel or other persons qualified to evaluate environmental restoration projects.

MITIGATION NOTES

SCALE AS NOTED

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Science & Design

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W6 OF 6

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