CRITICAL AREAS AND HABITAT MANAGEMENT REPORT

Blakely Elementary School

City of Bainbridge Island, Washington

July 19, 2017

RAEDEKE ASSOCIATES, INC.

Raedeke Associates, Inc.

Wetland & Aquatic Sciences
Wildlife Ecology
Landscape Architecture

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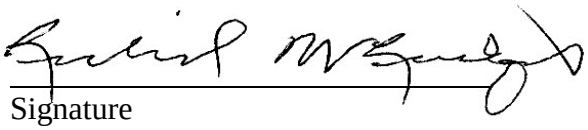

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1.0 INTRODUCTION

1.1 PURPOSE

This report documents the results of our field investigations and assessment of the wetlands and habitats in the vicinity of the building proposed on the Captain Johnston Blakely Elementary property, referred to herein as the Site or Blakely Elementary, and analyzes the proposed project impacts to these resources. The objectives of our study are to: evaluate existing site conditions with respect to wetland and wildlife habitat that currently occurs within the property, assess potential impacts of the proposed development plan, and develop habitat management recommendations which, if implemented, would result in improved buffer areas. This report includes information required for Habitat Management Plans, as outlined under Section 16.20.060 of the City of Bainbridge Island (2017a) code and provides supporting analysis utilizing best available science to determine and minimize impacts to critical areas. Some of the supporting analysis includes wetlands data, a 2014 Washington Department of Ecology Wetland Rating, and a functions and values evaluation for the off-site wetland area encountered during this study.

1.2 PROJECT LOCATION

The Blakely Elementary property consists of a parcel identified as Kitsap County Parcel Tax Number 03240220042005 located on Blakely Avenue NE in the City of Bainbridge Island, Kitsap County, Washington (Figure 1). Specifically, the Blakely property is located in Section 3, Township 24 North and 25 North, Range 2 East, W.M. with a site address known as 4704 Blakely Avenue NE, Bainbridge Island, Washington 98110.

1.3 SITE DESCRIPTION

The Captain Johnston Blakely Elementary School property, including an approximate 41,300 square-foot school building built in approximately 1963, associated outbuildings, parking, a playground, and associated landscape beds, is situated on a 12.17-acre parcel. The school building is located slightly north of the center of the property. Grass lawn is maintained in the vicinity of the buildings, parking, playground, and landscaped garden areas. The property is bordered on the west by Blakely Avenue and residential properties. It is bordered to the north, east, and south by mixed deciduous and coniferous forested areas associated with the approximately 250-acre Islandwood Environmental Learning Center (Islandwood) identified as Kitsap County Parcel Tax Number 03240210332002. On the Islandwood property and located east northeast of the Site is a large wetland area that was previously investigated by Raedeke Associates, Inc. (1999, 2007) and identified as Wetland 18.

The majority of the site generally drains and gently slopes from east to west toward Blakeley Avenue and in the direction of an off-site stormwater management facility

located south of the southwest corner of the Site. Portions of the northern and eastern sides of the property drain off-site toward the north and east, respectively. The northern portion of the site property, north of the existing school facilities, is a mixed forest of red alder (*Alnus rubra*, FAC), western hemlock (*Tsuga heterophylla*, FACU), and western arborvitae (*Thuja plicata*, FAC). Wetland 18, located off-site on the Islandwood property, is situated at its nearest point approximately 50 feet east of the Site. The forested buffer area along the eastern portions and primarily located off-site consists of primarily western hemlock (*Tsuga heterophylla*) and western arborvitae (aka western red cedar, *Thuja plicata*) with a mixed understory dominated by oso-berry (*Oemleria cerasiformis*, FACU) and Himalayan blackberry (*Rubus armeniacus*, FAC). The non-forested buffer area along the eastern portions of the site and entirely located onsite, consist of play areas made up of unvegetated (dirt), mowed lawn, paved and raised play areas for the students. Existing conditions photographs are provided in Appendix D of this report.

1.4 PROPOSED DEVELOPMENT PLAN

The proposal is to construct a new school building southeast of the existing school building so that the school does not have to shut down services during construction. Once the proposed/new school is constructed, the existing school building will be demolished so that the remaining proposed development plan can be constructed. Land use surrounding the proposed school building will consist of parking areas, educational trails and paths, stormwater management facilities, designated buffer protection areas, and play areas. The proposed school building footprint will total approximately 51,200 square feet and be located southeast of the existing school. The proposed building would be constructed in an area that is currently mowed lawn with paved and gravel play areas. The existing school building is proposed to be converted into a mowed and maintained open lawn play area, a proposed parking lot, and landscaped areas. Stormwater is currently not being managed on the site. The site generally drains toward Blakely Avenue and continues south along the eastern edge of the roadway. Stormwater generated by new roof area for the proposed additions would be routed to stormwater bioretention facilities and underground vaults located around the proposed building and along the western portions of the Site and primarily outside of the standard buffer required by the City of Bainbridge (2017a) Municipal Code.

The proposed building will be on city sewer and send wastewater to the nearest treatment facility located off-site. Wastewater will be piped out toward Blakely Avenue from the proposed buildings and is not anticipated to have any effect on the standard critical area buffers identified on the site. An existing waterline easement exists between the existing school building and the off-site Wetland 18 that bisects a portion of the eastern side of the site property. To supply water to the proposed building, a new waterline connection will be made from within the existing waterline easement and will be trenched and connected to the proposed school building.

Due to the location of the existing structures within buffers, site constraints, and the proposed development plan, buffer impacts from the proposed additions are unavoidable and necessitate the preparation of a Habitat Management Plan in compliance with City of Bainbridge Island (2017a) Municipal Code. An analysis of effect and proposed plan that identifies how the owner intends to mitigate buffer impacts discussed herein, as required in a habitat management plan, are presented later in this report. Mitigation involving federally listed threatened or endangered species, migratory waterfowl, or direct impacts to wetlands are not anticipated as part of this project. In the event that mitigation or project development work will involve these resources, the analysis of effect and mitigation discussed herein will need to be revised and updated accordingly.

1.5 DEMONSTRATED SUCCESS

Raedeke Associates, Inc. has had demonstrable success in preparation, obtaining agency approval, and implementing the type of Habitat Management Plan proposed. Examples include the following:

- Willow Remodel Habitat Management Plan, City of Bainbridge Island, WA (Raedeke Associates, Inc. 2012) Approved by the City of Bainbridge Island in 2012.
- Land Stewardship Plan for Suncadia Master Planned Resort, Kittitas County, WA. Approved through cooperative agreements with Kittitas County, WDFW and Yakama Nation;
- Littlefield Farm Wetland and Wildlife Assessment and Mitigation Plan, Snohomish County, WA (Raedeke Associates, Inc. 2011). Approved by Snohomish County;
- Duvall Urban Village Wetland, Stream, and Wildlife Assessment and Mitigation Plan, City of Duvall, WA (Raedeke Associates, Inc. 2009). Approved by the City of Duvall.

2.0 METHODS

2.1 DEFINITIONS AND METHODOLOGIES

Wetlands and streams are protected by federal law as well as by state and local regulations. Federal law (Section 404 of the Clean Water Act) prohibits the discharge of dredged or fill material into "Waters of the United States," including certain wetlands, without a permit from the U.S. Army Corps of Engineers (COE 2012). The U.S. Army Corps of Engineers (COE) makes the final determination as to whether an area meets the definition of a wetland and whether the wetland is under their jurisdiction.

The COE wetland definition was used to determine if any portions of the project area could be classified as wetland. A wetland is defined as an area "inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Federal Register 1986:41251).

We based our investigation upon the guidelines of the COE Wetlands Delineation Manual (Environmental Laboratory 1987), as further clarified in the Regional Supplement to the Corps of Engineers Delineation Manual: Western Mountains, Valleys, and Coasts Region (COE 2010). The COE wetlands manual is required by state law (WAC 173-22-035, as revised) for all local jurisdictions. As outlined in the 1987 wetland delineation manual, wetlands are distinguished by three diagnostic characteristics: hydrophytic vegetation (wetland plants), hydric soil (wetland soil), and wetland hydrology. Definitions for these terms are provided below.

Hydrophytic vegetation is defined as "macrophytic plant life growing in water, soil or substrate that is at least periodically deficient in oxygen as a result of excessive water content" (Environmental Laboratory 1987). The U.S. Army Corps of Engineers National Wetland Plant list Wetland Indicator Status (WIS) ratings were used to make this determination (Lichvar et al. 2016). The WIS ratings "reflect the range of estimated probabilities (expressed as a frequency of occurrence) of a species occurring in wetland versus non-wetland across the entire distribution of the species" (Reed 1988:8). Plants are rated, from highest to lowest probability of occurrence in wetlands, as obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and upland (UPL), respectively. In general, hydrophytic vegetation is present when the majority of the dominant species are rated OBL, FACW, and FAC. Common and scientific names of plants identified within each data plot and encountered during the field investigation were recorded. Pertinent data for purposes of this report are presented in Appendix A.

A hydric soil is defined as "a soil that is formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (Federal Register 1995: 35681). The morphological characteristics of the

soils in the study area were examined to determine whether any could be classified as hydric.

According to the 1987 methodology, wetland hydrology could be present if the soils were saturated (sufficient to produce anaerobic conditions) within the majority of the rooting zone (usually the upper 12 inches) for at least 5% of the growing season, which in this area is usually at least 2 weeks (COE 1991a). It should be noted, however, that areas having saturation to the surface between 5% and 12% of the growing season may or may not be wetland (COE 1991b). Depending on soil type and drainage characteristics, saturation to the surface would occur if water tables were shallower than about 12 inches below the soil surface during this time period.

Positive indicators of wetland hydrology include direct observation of inundation or soil saturation, as well as indirect evidence such as driftlines, watermarks, surface encrustations, and drainage patterns (Environmental Laboratory 1987). Hydrology was further investigated by noting drainage patterns and surface water connections between wetlands and streams within and adjacent to the project area.

2.2 BACKGROUND RESEARCH

Prior to conducting our field investigations, we collected and analyzed background information available for the site from the U.S.D.A. Natural Resources Conservation Service (NRCS 2017) Web Soil Survey, the U.S. Fish and Wildlife Service (USFWS 2016) National Wetland Inventory (NWI), The City of Bainbridge Island (2017b) Critical Areas Public Geographical Information System Maps, Kitsap County (2017) Parcel Map Search Critical Areas Maps, and the Washington Department of Natural Resources (WDNR 2017) Forest Practices Activity Maps. We also reviewed information from the Washington Department of Fish and Wildlife priority habitats and species database and SalmonScape databases (WDFW 2017) for documented information on the potential occurrence of federal- or state-listed endangered, threatened, sensitive, candidate, other priority, or monitor wildlife species within the study area. We also reviewed aerial photographs (Google Earth 2016) and United States Geological Survey (USGS 2017) 7.5-minute topographic maps to assist in the definition of existing plant communities, drainage patterns, and land use.

2.3 FIELD SAMPLING PROCEDURES

Mr. Will Hohman and Mr. Chris Wright of Raedeke Associates, Inc. visited the site on March 16, 2017 to delineate wetlands and streams within the study area. Raedeke Associates, Inc. staff previously visited the Islandwood property to delineate and map wetlands, streams, and habitats in 1999 and 2007, during which we reviewed and assessed the off-site wetland next to the Site as Wetland 18. Information and data collected during those projects were reviewed and utilized to supplement this report

(Raedeke Associates Inc. 1999, 2007). Wetland flagging was professionally surveyed by a consultant under contract with Bainbridge Island School District and provided by Mithun via email on April 10, 2017.

During our field investigation, we inventoried, classified, and described representative areas of plant communities, soil profiles, and hydrologic conditions in both uplands and wetlands. We searched specifically for areas with positive indicators of hydrophytic vegetation, hydric soil, and wetland hydrology.

Vegetation, soils, and hydrology were examined in representative portions of the investigated area according to the procedures described in the COE Wetlands Delineation Manual (Environmental Laboratory 1987). Areas investigated were examined per the 1987 Manual as updated by the Regional Supplement (COE 2010). Plant communities were inventoried, classified, and described during our field investigation. We estimated the percent coverage of each species. Plant identifications were made according to standard taxonomic procedures described in Hitchcock and Cronquist (1976), with nomenclature as updated by the U.S. Army Corps of Engineers National Wetland Plant List (Lichvar et al. 2016). Wetland classification follows the USFWS wetland classification system (Cowardin et al. 1992). We determined the presence of a hydrophytic vegetation community using the procedure described in the 1987 Manual (Environmental Laboratory 1987), and the Regional Supplement (COE 2010), which requires the use of the dominance test, unless positive indicators of hydric soils and wetland hydrology are also present, in which case the prevalence index or the use of other indicators of a hydrophytic vegetation community as described in the Regional Supplement (COE 2010) may also be required. Wetlands delineated prior to and after the COE 2010 regional supplement were delineated in general accordance with the applicable delineation requirements at the time of the delineation.

We excavated pits to at least 20 inches below the soil surface, where possible, in order to describe the soil and hydrologic conditions throughout the study area. We sampled soil at locations that corresponded with vegetation sampling areas and potential wetland areas. Soil colors were determined using the Munsell Soil Color Chart (Munsell Color 2009). We used the indicators described in the 1987 Manual and Regional Supplement (COE 2010) to determine the presence of hydric soils and wetland hydrology for wetland areas.

Our evaluation of the wetland boundaries was based on the presence of hydric soil, hydrophytic vegetation, and indicators of wetland hydrology. Topographic changes within the context of the landscape were used to aid in our review of the previously delineated the wetland boundaries.

In addition to delineating the wetland unit, we collected data and information on the buffer of the wetland nearest and on the project site. We noted characteristics of the

buffer such as landscape, landform, land-use, cover type, drainage, and soil conditions at the time of our site visit.

3.0 EXISTING CONDITIONS

3.1 RESULTS OF BACKGROUND INVESTIGATION

3.1.1 Soil Conservation Service Maps

According to the USDA NRCS (2017) Web Soil Survey, the soils of the project area were mapped as Kapowsin gravelly ashy loam, 0 to 6% slopes (22) (Figure 2). The soil survey also shows the off-site wetland located east northeast of the site as "water" (Unit 64) along with Mukilteo peat (Unit 33). Soil series boundaries or mapping units are mapped from aerial photographs with limited field verification. Thus, the location and extent of the boundaries between mapping units may be approximate for a given parcel of land within the survey area. In addition, mapping units described by the SCS may encompass smaller inclusions that were not shown as separate units on the survey maps. For example, non-hydric soil units may contain areas of poorly-drained to very poorly-drained hydric soil, which could be classified as wetland. Conversely, there may be areas of well-drained or moderately well-drained soils within mapping units designated as hydric.

According to the USDA NRCS (2017) Web Soil Survey, 22 soils have a typcial 6% inclusion rating of hydric soils within the mapped soil unit. This 6% indicates the percentage of map Unit 22 that meets the criteria for hydric soils (i.e., wetland soils). According to Mithun, geotechnical test borings were conducted at the site providing useful information that much of the site exists on fill (Aspect 2017).

3.1.2 National Wetland Inventory

The USFWS NWI (2016) depicts a freshwater pond and freshwater forested and scrub-shrub wetland within 500 feet of the project site (Figure 3). The mapped pond feature is located east northeast of the site, and the wetland area is depicted north and contiguous to the pond feature but is located further from the project site. USFWS NWI does not map any wetlands on the site. Wetlands shown on the NWI are general in terms of location and extent, as they are determined primarily from aerial photographs. Thus, the number and areal extent of existing wetlands located within the project area may differ from those marked on an NWI map.

3.1.3 City of Bainbridge Island and Kitsap County Critical Areas Mapping

The City of Bainbridge Island (2017b) and Kitsap County (2017) provide public on-line geographical information systems data regarding critical areas and parcels (Figure 4). Upon review of these maps, both depict a large wetland area east northeast of the site and two smaller wetland areas south of and apparently within 250 feet of the site. The two wetlands south of the site are depicted approximately 50 feet from the center of the southern property boundary and a smaller wetland is 200 feet further south of this wetland.

3.1.4 WDNR Forest Practice Activity Map

The WDNR (2017) Forest Practice Activity Map for the study area depicts a Type Ns stream over 500 feet north of the northern property boundary.

3.1.5 WDFW Priority Species Database and SalmonScape

The WDFW (2017) PHS database map does not depict any State of Federal listed species (threatened, endangered, or sensitive) within the project site or its vicinity. The PHS database map does map a wetland area similar to the NWI map in the vicinity of the site property. WDFW SalmonScape does not map any fish-related streams or associated fish structures or barriers of concern at or in the vicinity of the site. SalmonScape does map a Swamp Marsh area under its National Hydrography Database Water Bodies layer feature east northeast of the site and in the vicinity of the previously mentioned mapped wetland/pond features. This also corresponds to the location of the wetland identified during our field investigations summarized the following section of this report.

3.2 RESULTS OF FIELD INVESTIGATIONS

During our field investigations, Raedeke Associates, Inc. did not find any wetlands located on the Site. Specifically, the forested area in the northern half of the property consisted of dominant plant species adapted to life in uplands and lacked indications of wetland hydrology and wetland soils (hydric soils). In general, the remainder of the site consisted of manicured landscape beds, mowed and maintained lawns, play areas, parking, and the existing school building. Refer to sample plot data on Figure 2 and Appendix A for additional information regarding the on-site conditions. Upon re-investigating portions of the Islandwood property nearest the Site (off-site areas), we re-delineated the nearest portions of Wetland 18 as part of this study. For purposes of this investigation, only the edges of wetland area nearest the Site were delineated with photo-degradable plastic flagging. Results of the investigation of Wetland 18 are presented in the subsequent section.

3.2.1 Wetland 18

Wetland 18, discussed in Raedeke's previous investigations as Wetland 18 or the Cattail Marsh (Raedeke 1999, 2007), totals approximately 8.44 acres in area and occurs east northeast of the Blakely Elementary School property site (Figure 5).

Vegetation

Wetland 18 consists of palustrine, forested, scrub-shrub, emergent, and open water communities dominated by western hemlock (*Tsuga heterophylla*, FACU), western arborvitae (*Thuja plicata*, FAC), Pacific ninebark (*Physocarpus capitatus*, FACW), Douglas spirea (Spiraea douglasii, FACW), and common cattail (*Typha latifolia*, OBL). Central portions of Wetland 18 contain an open water component and a floating mat of sphagnum moss, whereas the western arborvitae trees are generally rooted at the edge of

the wetland. The forested and scrub-shrub portions of this wetland occur primarily along the north and west sides of the wetland. Cattails dominate the eastern and central portions of the wetland.

Soils and Hydrology

During our March 17, 2017 site investigation, soils at the southwestern edge of the wetland were identified as being hydric, consisting of a layer of arborvitae remnants and organics (woody peat in texture) greater than 8 inches thick overlying a dark gray (2.5Y 4/1) silty clay loam mineral soil layer. Ponding was observed at depths between 12 inches and more than 3 feet in certain areas. The hydrogeomorphic classification (HGM) of Wetland 18 is depressional and receives hydrologic input from groundwater discharge, interflow from surrounding uplands, and precipitation.

During our previous site investigations soils were identified as being hydric, consisting of greater than 15 inches of black (7.5YR 2.5/1) woody peat textured soil in the area sampled (Raedeke Associates Inc. 1999, 2007). Ponding to depths greater than 18 inches was observed in the wetland during these investigations. This field work was conducted in February and March of 1999 and August of 2007. Based on its size, presence of organic soils, and interspersed vegetative cover, Wetland 18 was rated as a dual rated Category I/II wetland, per criteria of the City of Bainbridge Island Municipal Code and the wetland ratings system in effect at the time of our previous site investigations in 1999 and 2007.

Determination and Classification

Based on our March 2017 site investigation, we observed hydrophytic vegetation, wetland hydrology, and hydric soils in the wetland. Positive indicators for each of the three wetland parameters at the time of our site investigation means that the delineated area meets the necessary criteria for designation as a wetland according to the guidelines of the COE (Environmental Laboratory 1987) and the Regional Supplement (COE 2010). During the field work, we delineated the wetland edge nearest the site with 26 flags labeled alpha-numerically with "A#." Alpha-numeric numbering was selected so as to not conflict with any remnant flagging from the previous studies performed by Raedeke Associates, Inc., but the wetland is described herein as Wetland 18 for continuity between reports.

Wetland 18 consists of a palustrine, scrub-shrub, broad-leaved deciduous, emergent, persistent, and aquatic bed, rooted vascular (PSS1/PEM1/PAB3) wetland according to the USFWS (Cowardin et al. 1992) wetland classification system.

Per requirements of City of Bainbridge Island (2017a) Municipal code, we rated the wetland using the Washington Department of Ecology's (WDOE) 2014 Wetland Rating

System for Western Washington (Hruby 2014). See Appendix B for the completed wetland rating forms. The delineated wetland was rated using the HGM methodology for depressional wetlands. The results categorize the wetland as Category II wetland that scored a total of 20 points with 8 habitat points. Due to the bog component of the wetland, it receives a dual rating as a Category I/II wetland since bogs are considered to be wetlands with special characteristics and are categorized as Category I wetlands per the WDOE guidance (Hruby 2014). The bog mat portion appeared to be well inside the wetland boundary at the time of our site visit.

The City of Bainbridge Island (2017a) Municipal code (BIMC) requires standard buffer widths of 100 feet to protect water quality functions and an additional 200 feet to protect habitat functions, for a total buffer width of 300 feet for both Category I and II wetlands with high habitat scores. The City of Bainbridge Island also requires a building setback of 15 feet from the edge of any wetland buffer unless waived by the Director as provided under BIMC 16.20.160(D)(10) following a determination that the proposed structural or impervious surface is minor and that it will not adversely impact wetland functions.

3.2.2 Adjacent Uplands

Uplands adjacent to the southwest portion of Wetland 18, between the wetland and the Blakely Elementary property, consist of a second-growth mixed coniferous and deciduous forest. Dominant canopy trees include western arborvitae and bigleaf maple (*Acer macrophyllum*, FACU), with evergreen blueberry (*Vaccinium ovatum*, FACU) and western arborvitae saplings dominant in the understory. Pineland swordfern (*Polystichum munitum*, FACU), Himalayan blackberry, brackenfern (*Pteridium aquilinum*, FACU), salal (*Gaultheria shallon*, FACU), English holly (*Ilex aquifolium*, FACU), and English ivy (*Hedera helix*, FACU) are scattered throughout. Soils consist mainly of 3 to 6 inches of dark gray (7.5YR4/1) silty loam over dark yellowish brown (10YR 4/4) gravelly sandy loam. No primary or secondary indicators of wetland hydrology were observed during our March 2017 site visit. Therefore, we found no wetland areas in the forested areas immediately adjacent to the site property.

Portions of the uplands adjacent to Wetland 18, located on the project site, that drain toward the wetland unit consist of mowed and maintained lawn areas compacted from use as a play area by the students. The lawn area is made up of sparsely vegetated turf with a portion of the area that drains toward the wetland consisting of a paved play area and a raised playground area (Figure 5). Photos of this portion of the uplands that are located on site are provided as Attachment D of this report.

Furthermore, we found no wetland areas off-site and south of the site property in the general vicinity nearest the property and shown on the Bainbridge Island inventory (Figure 4). A small drainage pattern running parallel with the southern property boundary was observed to convey water, when present, east to west toward the stormwater facility located south of the southwest corner of the site property. Vegetation in this location consisted of big-leaf maple, red alder (*Alnus rubra*, FAC), Oso-berry

(*Oemerlia cerasiformis*, FACU), English holly, salal, cut-leaf blackberry (*Rubus laciniatus*, FACU), and Pineland swordfern. Soils consisted of 6 to 8 inches of dark grayish brown and very dark grayish brown silt loam and gravelly silt loam underlain by soils with marginal redoxomorphic features between 6 to 12+ inches of silt loam and gravelly silt loam in the two locations observed along the southern property line (Figure 2, SP-5 and SP-6, respectively). Although surface ponding was observed in these locations, the area lacked hydrophytic vegetation and hydric soils conditions sufficient for an area to be called a wetland. Along with the wetter than normal winter season, 1.85 inches of precipitation was observed in the 3 days leading up to our site visit.

4.0 WETLAND FUNCTIONS AND VALUES ASSESSMENT AND EXISTING BUFFER EVALUATION

Per requirements for preparation of habitat management plans outlined in BIMC 16.20.060, functional assessments were prepared for Wetland 18. The Washington State Department of Ecology Wetland Rating System for Western Washington 2014 Update (Hruby 2014) and The Washington State Department of Transportation (WSDOT 2000) Wetland Functions Characterization Tool for Linear Projects were used to evaluate wetland functions and values provided by Wetland 18. The WDOE 2014 and WSDOT 2000 wetland data forms for Wetland 18 are presented in Appendix B and C, respectively.

The WDOE 2014 Wetland Ratings system provides an analysis of the rarity, sensitivity to disturbances, and functions and values of wetlands in order to determine the level of protection, via buffers, that local jurisdictions require when working near wetland areas.

The Washington State Department of Transportation (WSDOT 2000) Wetland Functions Characterization Tool for Linear Projects broadly divides wetland functions and values into hydrologic functions, biological functions, and social values. The functions and values evaluated are typically based on best professional judgement.

Hydrologic functions include flood flow alteration, sediment removal, nutrient and toxicant removal, and erosion control/shoreline stabilization. For wetland buffers, this includes understanding drainage through the buffer before reaching the wetland unit. Biological functions include production of organic matter and its export, general habitat suitability, habitat for aquatic invertebrates, amphibians, wetland-associated mammals, and wetland-associated birds, as well as, general fish habitat and native plant richness. This includes the upland habitats immediately adjacent to wetlands (i.e. the buffers) that are used by such species. Social values for both wetlands and their buffers include educational or scientific value, as well as uniqueness and heritage.

4.1 HYDROLOGIC FUNCTIONS

Wetland 18 is likely to provide most hydrologic functions typical to wetlands. However, because it is a depression with a highly constricted outlet located nearest the headwaters of a drainage basin, the wetland provides very minimal (if any) hydrologic functions in the form of shoreline stabilization and erosion control. If the overflow outlet that is already highly constricted is altered, many hydrologic functions and values could be lost. The proposed project, however, does not intend to directly impact this wetland or its overflow area.

Generally, Wetland 18 does have the potential to provide floodwater storage and desynchronization because it is a large wetland located in the upper portion of the watershed, and is located in a relatively deep depression with a single, highly-constricted

outlet. Wetland 18 also has moderate potential to remove sediments because it can hold water for a relatively long period of time and has dense vegetation to trap sediments. Wetland 18 also has the potential to remove nutrients and toxicants because of its ability to store water for long periods, the presence of dense emergent and aquatic vegetation, and organic soils; however, because most of the wetland remains permanently inundated, it unlikely to perform significant denitrification.

4.2 BIOLOGIC FUNCTIONS

Wetland 18 is likely to provide all of the biological functions. It is situated in a very established and undisturbed wetland that contains a variety of habitat types, a high level of structural diversity, a high diversity of plant species, large areas that are permanently inundated, and a high level of interspersion between habitats. Wetland 18 has high potential to provide general habitat suitability, and habitat for aquatic invertebrates, waterfowl, and amphibians. Wetland 18 has moderate potential to provide habitat for wetland-associated mammals and birds, although it is likely to provide suitable habitat for beavers and wetland-associated songbirds. Its buffer and proximity to several other wetlands increases the potential for the wetland to perform many of the functions mentioned above. Although Wetland 18 likely produces a large amount of organic matter, the wetland provides only low to moderate potential to export it due to highly constricted and limited surface water connection to other aquatic systems. Furthermore, the wetland does not appear to support fish because it is not connected to a fish-bearing stream.

4.3 SOCIAL FUNCTIONS & VALUES

Wetland 18 is also likely to provide educational/scientific value because it is in public ownership and has documented scientific or educational use by Islandwood Learning Center and Blakely Elementary School. Wetland 18 may have value for uniqueness and heritage due to the presence of wetland bog habitats designated by WDFW (2008, 2017).

4.4 WETLAND BUFFER EVALUATION

In general, buffers may consist of relatively undisturbed vegetated zones adjacent to critical areas (Granger et al. 2005, Hruby 2013). The on-site buffer for the off-site Wetland 18, however, contains disturbed areas from past activities and ongoing disturbances from frequent use as a playground. For Wetland 18 as a whole, the 300-foot buffer, based on the Wetland Rating (Hruby 2014) and the City of Bainbridge Island (2017a) Municipal Code for Critical Areas, is made up primarily of forested areas. Portions of the buffer are developed, however, on both the Islandwood property adjacent to the site and on the Blakely Elementary property (Site) consisting of buildings, hardscaping, paved areas, landscape areas, and mowed play areas. In fact, the portion of the wetland's contributing drainage area that is on the Blakely Elementary project site

consists of less than 5% of the overall buffer surrounding the wetland (as a whole), according to aerial photography and Environmental Protection Agency (EPA) catchment delineations.

To better understand buffers, they are vegetated areas adjacent to wetlands that can reduce impacts from adjacent land uses through various physical, chemical, and/or biological processes (Granger et al. 2005). Buffers can help protect and enhance water quality by blocking the entrance of pollutants or greatly reducing the concentration of the pollutants into the resource that is of concern to protect (in this case, Wetland 18). In other words, buffers can prevent polluting or impacting wetlands negatively, for example, by filtering pollutants from surface water runoff before it enters the wetland, which could potentially degrade water quality or species biodiversity. The vegetative cover within a buffer in combination with soils, width, and slope will determine the amount of subsurface and surface pollutant removal (i.e. treatment) will occur before water reaches the wetland. A buffer planted in grass can adequately perform many functions including trapping sediment and other contaminants (Sweeney 2014), but if highly managed as lawn, provides only very limited habitat and water quality functions. Well-vegetated buffers typically function substantially better than poorly vegetated buffers (Granger et al. 2005). In addition, these upland buffer areas adjacent to wetlands provide habitat for various wildlife species that utilize or live in and around the wetland. For example, in Western Oregon forested habitats, reptiles and amphibians that depend upon riparian buffer areas may require buffers of at least 240-feet (Gomez and Anthony 1996). These authors similarly noted that many species may also require preservation of large areas of old growth and upland habitat, where available, as well. Moreover, buffers can also provide protection from wind and sound for species that are sensitive to these types of atmospheric occurrences.

The portion of the of the contributing drainage basin to Wetland 18 that is on the project site consists of apparent native growth forest and mowed lawn play areas, as described earlier (see Figure 5 and Appendix D). Due to the landscape position of the site and the on-site topography within the buffer, only a portion of the buffer truly provides ecosystem services for the wetland (i.e. the within the wetland drainage basin; see Figure 5). Moreover, the standard 300-foot buffer is considered disturbed by past activities and currently is not functioning as a well-vegetated undisturbed plant community. As mentioned previously, well-vegetated buffers will function substantially better than poorly vegetated buffers. Much of the existing on-site standard buffer is poorly vegetated, consisting of exposed/compacted soils, and currently does not fully function to protect the wetland unit (see photos in Appendix D).

In this report, we discuss the differences in value and function of different land cover types and land uses in the buffer because certain features of the existing buffer will remain the same after the proposed project is constructed. Other aspects of the buffer when analyzing the differences between existing conditions and proposed conditions will change, however, and these characteristics are described in more detail in the impacts and

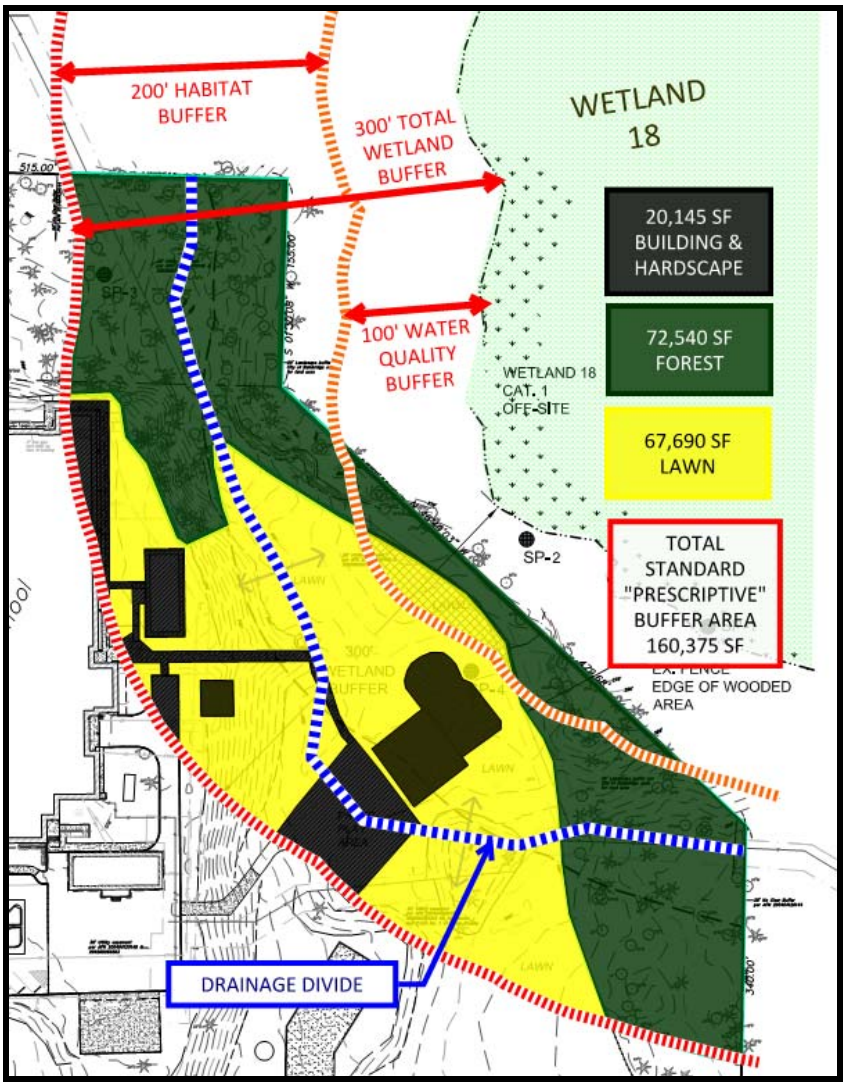
habitat management sections of this report. This report is not intended to be an exhaustive scientific analysis of all functions provided by buffers (nitrogen removal, phosphorous capture, flood attenuation, width, slope, soil types, acidity, pollutant pass through factors and identifying detailed effectiveness removal and uptake factors of specific species, etc.) but rather present a common understanding of the performance of buffers to provide certain supplemental functions that are inherently valuable to protect Wetland 18. This is based on literature and the collective understanding of drainage basins and the ecological processes that plants provide in this world. Refer the subsequent sections further explaining the existing and proposed buffer functions and values at the project site.

Here is a list of the current functions and values of the existing 300-foot standard wetland buffer. Refer to the existing conditions photos provided in Appendix D for pictures of the current condition of the buffer areas:

1. Contiguous forested areas provide good habitat for wildlife,
2. Portions of the water quality buffer are currently regularly mowed lawn areas,
3. Existing lawn areas consist of poorly vegetated play areas that are regularly accessed by students and people,
4. Soils in the lawn areas are compacted from existing uses providing limited mobility of stormwater by infiltration,
5. Impervious buildings and hardscape exist in the form of paved play areas, raised play areas with playground equipment, the existing school buildings and structures, and impervious paths (sidewalks),
6. Stormwater runoff from existing buildings and hardscape within the habitat buffer currently run off site without any stormwater management or little ability to be pre-treated or infiltrate due to regularly accessed and compacted surrounding soil areas,
7. Due to regular access and increased noise in the existing lawn areas, habitat value and function is considerably lower than the forested areas.

A detailed breakdown of the project site's existing buffer land uses is depicted on Figure 5 of the report. However, the following image generalizes the existing land uses into three categories: 1. Building and Hardscape, 2. Forest, and Lawn areas within the entire standard "prescriptive" buffer are that encroaches on site. Figure 5 further breaks out the existing buffer to help understand the area that truly services the wetland (i.e. the various land uses within the wetland drainage area)

Image 1: Existing Standard Wetland Buffer Conditions (Forest, Impervious, and Lawn) - Refer to Figure 5 for a more detailed summary of existing land uses



5.0 REGULATORY CONSIDERATIONS

Wetlands and streams are protected by Section 404 of the Federal Clean Water Act and other state and local policies and ordinances including the City of Bainbridge Island (2017a) Municipal code. Regulatory considerations pertinent to wetlands and streams at the site are subject to Federal, State, and City of Bainbridge (2017a) Critical Areas Regulations discussed below; however, this discussion should not be considered comprehensive. Additional information may be obtained from agencies with jurisdictional responsibility for, or interest in, the site. A brief review of federal and state regulations and City of Bainbridge policy, relative to wetlands, is presented below.

5.1 FEDERAL CLEAN WATER ACT (U.S. ARMY CORPS OF ENGINEERS)

Federal law (Section 404 of the Clean Water Act) discourages the discharge of dredged or fill material into the nation's waters, including most wetlands and streams, without a permit from the U.S. Army Corps of Engineers (COE). The COE makes the final determination as to whether an area meets the definition of "Waters of the U.S." as defined by the federal government (Federal Register 1986:41251), and thus, if it is under their jurisdiction.

We should caution that the placement of fill within wetlands or other "Waters of the U.S." without authorization from the COE is not advised, as the COE makes the final determination regarding whether any permits would be required for any proposed alteration (COE 2012). If any modification of wetlands or streams is proposed, we recommend requesting a jurisdictional determination from the COE prior to any construction activities. However, we understand that the proposed school project does not involve any direct impacts to the off-site wetland. A jurisdictional determination can also provide evaluation and confirmation of our delineation by the COE, if desired.

5.2 STATE OF WASHINGTON

Under Section 401 of the Clean Water Act, an activity involving a discharge in waters of the U.S. and authorized by the COE must also receive certification that the federally permitted activity complies with the federal Clean Water Act, state water quality laws, and any other appropriate state laws (such as the Water Resources Act and Hydraulic Code). In Washington State, the certifying agency is usually the Washington Department of Ecology (WDOE). In addition, if the COE-authorized permit is for actions within the 15 coastal counties, including Kitsap County, then the WDOE must confirm or deny that the proposed action complies with the Washington Coastal Zone Management Program. Again, as currently proposed, the project does not involve any direct impacts to the off-site wetland.

The WDOE also regulates activities within isolated wetlands under the state Water Pollution Control Act (90.48 RCW) and the Shoreline Management Act (90.58 RCW)

in instances where a wetland or water is determined to be non-jurisdictional by the COE. The standards of review for issuance of a permit by the WDOE for activities within non-COE-jurisdictional wetlands or waters are the same as those for Section 401 certifications.

5.3 CITY OF BAINBRIDGE ISLAND

City of Bainbridge Island (2017a) Municipal Code regulates wetlands and streams as critical areas under Title 16 Environmental Chapter 16.20 Critical Areas. Alterations of wetlands or streams and their buffers are generally prohibited, except as allowed under certain conditions. All direct wetland impacts must be mitigated through wetland creation, restoration, or enhancement. In addition , replacement ratios for buffers shall be 1:1. The City of Bainbridge Island has the final authority to determine wetland ratings, buffers, and allowed uses of wetlands, their buffers, and other sensitive areas that are under their jurisdiction.

We rated the wetland within the project areas using the 2014 WDOE Wetland Rating System for Western Washington (Hruby 2014), as required and clarified by City of Bainbridge Island (2017a) Municipal code for determination of wetland buffer widths and mitigation ratios (see Appendix B) and per communication with Ms. Christy Carr of the City of Bainbridge Island Department of Planning & Community Development via voicemail on March 22, 2017. The wetland scored 8 points for habitat function for which the City of Bainbridge Island (2017a) requires a 300-foot buffer. This buffer consists of an inner 100-foot water quality buffer and outer 200-foot habitat buffer. Table 1 summarizes the off-site wetland within the project study area and its probable rating and corresponding buffer.

Because it is not feasible to provide the standard 300-foot buffer or apply buffer averaging, the site plan proposes a reduced buffer that fully encompasses the water quality buffer and provides compensation for unavoidable impacts. The City of Bainbridge Island (2017a) Municipal Code clearly states that Habitat Management Plans, such as this, may not be used to reduce the water quality buffer for wetlands. This project does not propose a reduction of the water quality buffer but does propose enhancement and restoration of portions of it. Conservatively, the proposed buffer compensation is designed to mitigate for all impacts within the standard buffer.

6.0 IMPACTS

For purposes of this study, it is important to understand that buffers are dynamic in nature and contain many characteristics which determine its overall value and function that must be evaluated on a case-by-case and site-specific basis. For instance, no wetlands are located on the project site. In addition, the project site contains some forested buffer areas but also contains poorly vegetated, compacted, regularly accessed, and mowed play areas. Fortunately, some of the characteristics of the project site buffer will remain the same (i.e. constant) when comparing existing site conditions with the proposed project design. For instance, the existing drainage divide within the standard buffer will generally remain the same when the proposed site plan is built. A portion of the proposed building will capture some of the wetland drainage area's stormwater and re-route it through stormwater management facilities. Therefore, it is important to note that the analysis of function and value of the buffer at the project site will greatly depend on what the land cover consists of and how drainage (or land use) would change under the proposed site plan compared to existing site condition.

This section presents our analysis of the wetland impacts, which are none, and the entire 300-foot standard "prescriptive" buffer (standard buffer) at the site. Specifically, we discuss the portions of the standard buffer that provide little to no function or value as well as the areas that provide high quality function and value to protect (buffer) the wetland from pollutants while also providing habitat for wildlife. We discuss and compare both the existing and proposed development scenarios.

According to City of Bainbridge Island (2017a) Municipal Code 16.20.060 B. the intent of the code and the Habitat Management Plan is to provide improved buffers from degraded past activity. The City of Bainbridge Island (2017a) Municipal Code (Section 16.20.060 D) indicates that impact mitigation of proposed projects, such as the proposed site design, shall encompass an area large enough to provide mitigation for buffer reduction below the standard required buffers and (per 16.20.060 C) may propose, but is not required, to provide a habitat buffer containing a greater area than is required by the standard "prescriptive" buffer. This study analyzes impacts to the entire standard buffer and provides buffer compensation for the proposed habitat buffer impacts under the proposed design while also providing restoration and enhancement to the water quality buffer.

Approximately 160,375 square feet of standard "prescriptive" buffer exists on the project site. Figure 5 and Image 1 presents a depiction of the site's existing land uses within the standard buffer. Based on the drainage divide depicted on this plan, provided by Mithun, Inc. via email on April 11, 2017, only portions of the habitat buffer drain toward the wetland (approximately 71,970 square feet), and the entire water quality buffer drains toward the wetland (approximately 12,015 square feet). Regardless of where water drains within the buffer, this report provides mitigation for unavoidable impacts to the entire standard buffer located on site. By doing this, we are accounting for more buffer

areas than are functioning to protect Wetland 18, which means that more area is being mitigated for than is truly functioning to protect the wetland unit. To better understand what portions of the buffer are functioning to protect the wetland unit, we discuss the entire standard buffer required by code and the area of the standard buffer that drains toward the wetland unit. Buffer impacts are calculated based on the information provided by Bainbridge Island School District's consultant, Mithun, Inc., on July 11, 2017.

6.1 DIRECT IMPACTS

The proposed project does not include any direct impacts to Wetland 18 or the existing contiguous native growth forested areas within the standard buffer that are located on site. By Mithun designing as such, the project design has demonstrated appropriate avoidance and minimization measures typical to preparing mitigation for unavoidable impacts to wetlands and critical areas.

6.2 HYDROLOGIC IMPACTS

As discussed in Section 3.2 above, the primary source of hydrology to Wetlands 18 is shallow groundwater seepage and surface water runoff within the drainage basin during storm events. This source of wetland hydrology in volume and duration is likely to be unchanged under the development proposal except for a portion of the building area that will encroach into the drainage divide (i.e. the wetland drainage basin). The small area of the proposed building encroaching into the drainage divide would divert runoff away from the wetland basin (approximately 3,945 square feet). Run-off from all new impervious surface created by the new building will be routed to the stormwater infiltration facilities or to dry-wells/rain gardens adjacent to the proposed structures according to Mithun. This will effectively pre-treat stormwater per the Washington Department of Ecology's 2012 Stormwater Management Manual for Western Washington and the 2012 Low Impact Development Technical Guidance Manual for Puget Sound (2012) as adopted by the Bainbridge Island (2017) Municipal Code. This pre-treatment will occur before entering groundwater or the City's existing stormwater drainage facilities. Furthermore, surface water that will drain through the proposed buffer compensation areas will provide better filtering of pollutants than the existing mowed poorly vegetated lawn areas.

6.3 WETLAND BUFFER IMPACTS

The proposed site plan includes construction of a portion of the new school building and associated fire lane within the non-forested portions of the standard 300-foot wetland buffer. The standard buffer for Wetland 18 includes a 100-foot water quality buffer and an additional 200-foot habitat buffer, for a total of a 300-foot wetland buffer measured on a horizontal plane from the wetland edge. However, based on the site's existing developed and maintained school areas, certain portions of the standard habitat buffer do

not drain surficial stormwater toward Wetland 18 and certain portions do drain toward the wetland. Refer to the drainage divide line indicated within the prescriptive 200-foot habitat buffer (see Figures 5, 6, and 7). This line, also described as the wetland basin boundary, was delineated and provided by Mithun Inc. on April 11, 2017.

As noted above, the proposed design will not change the existing drainage divide except for a small portion of the proposed building capturing and re-directing stormwater to a stormwater management facility located outside of the standard buffer (Figure 6 and 7). Drainage on the overall site and pre-treatment of drainage before it leaves the project site, will therefore be improved with the proposed project design.

The area of standard buffer that drains away from the wetland, with the exception of the existing forested areas, is considered to be a non-functional or very low functioning habitat buffer since it does not collect and contribute water directly to Wetland 18 and since school activities involve frequent disturbances by students. Approximately 3 trees within the open lawn play areas of this low-functioning portion of the on-site buffers, possibly previously planted in the landscape when the school was built, will be removed in order to construct the proposed building. This low-to non-functioning area is, however, located within the standard 300-foot buffer area. Furthermore, existing land uses within the functioning portions of the buffer, with the exception of the forested portions, provide limited functionality and value as a buffer to the wetland. These areas, as previously described, consist of regularly mowed lawn and play areas that are accessed frequently by students and people that utilize this space during and outside of normal school hours (See Figure 5 and Appendix D).

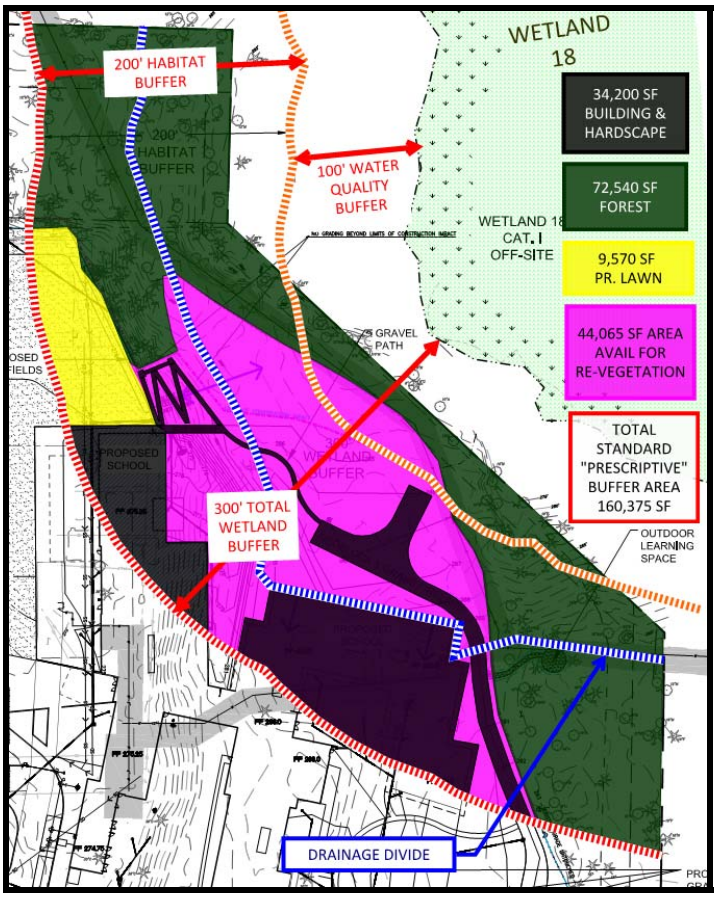
Under the proposed design, direct impacts to the water quality buffer would be avoided and minimized under the proposed development plan (Figure 6). However, the proposed site plan includes enhancement of the water quality buffer via plantings of a mixture of native trees and shrubs, as well as vegetative enhancements within portions of the habitat buffer (Figure 7). The contractor will need to tap into an existing waterline located within an easement that runs along the eastern property boundary. The water quality buffer in this location consists of maintained mowed lawn areas where students play. Although the proposed limits of work provided by Mithun indicates some work within the water quality buffer in this location, any impacts within this area during construction will be brought back to pre-construction contour elevations and re-vegetated according to the proposed buffer compensation plan (Figure 7) and Mithun's landscape plans provided to Raedeke Associates Inc. on July 11, 2017.

Conservatively, our analysis of impacts assumes all forested areas on the site that are contiguous to the water quality buffer, within the habitat buffer, on both sides of the drainage divide, provide quality habitat for wildlife that may utilize the wetland. The portions of these forested areas that do drain toward the wetland that are located within the habitat buffer serve both value and function for the wetland by also providing some water quality benefits. Furthermore, the existing cleared areas depicted as lawn on

Figure 5 within the contributing basin of the wetland currently provide very low buffer functions, as discussed in Section 4.4. Lastly, the remaining areas of lawn that do not drain toward the wetland (i.e. outside the contributing basin of the wetland) provide little to no buffer function to protect the wetland. Only wildlife adapted to urban conditions and wildlife that access the site outside of normal school hours utilize this area, if at all.

The following presents a summary of anticipated wetland buffer impacts associated with the proposed design and associated land uses for comparison with the site's existing land uses depicted in Image 1 of this report. Mithun, to date, has implemented avoidance and minimization measures with their selected design to avoid having to remove trees within the existing forested areas of the habitat buffer of Wetland 18. Specifically, Mithun's avoidance and minimization measures included getting approvals from the Fire Marshall to reduce the standard roadway width of the required fire lane and by eliminating academic space in the school. The following image details the proposed land uses at the project site.

Image 2: Proposed Standard Wetland Buffer Areas (Forest, Impervious, Proposed Lawn, and Areas available for re-vegetation) - Refer to Figures 6 & 7 for a more detailed summary of proposed buffer land uses and buffer compensation areas.



Within the entire standard prescriptive buffer, we identified the following impacts:

- There will be no change in the existing contiguous forested areas (72,920 square feet to remain unchanged) with the exception of the following:
    - An approximate 485 square feet outdoor education space will be integrated into the forest area consisting of 3 inches of pervious triple shredded mulch once existing invasive species and understory growth is cleared (native vegetation to remain). This is to be installed and is permissible (subject to City approval) per City of Bainbridge (2017a) Municipal Code (Section 16.20.160 Wetlands. E. Educational and Scientific Activities).
- There will be approximately 14,055 square feet of additional impervious area (conservatively including the proposed pervious fire lane) in the standard buffer. However, approximately 4,105 square feet of existing calculated buildings and hardscape will be removed from the wetland drainage area in the proposed design condition. This will result in additional vegetated areas and less impervious areas in the proposed buffer condition that contribute drainage toward the wetland.
- Because of the increased impervious area in the standard buffer, approximately 53,635 square feet of existing lawn or building/hardscape will be available to be re-vegetated with proposed lawn (playfields) and native plant species (Figures 6 and 7). This loss of vegetated area consists of the 14,055 square feet of proposed additional impervious area within the standard buffer. Despite the loss in vegetated areas within the standard buffer, impervious area is being removed from the wetland drainage basin and will be re-vegetated with native plant species.

Since the entire 53,635 square feet of available standard buffer for re-vegetation will be planted with approximately 9,570 square feet of proposed lawn and approximately 44,065 square feet of native and native naturalized plant species, including portions of the buffer that drain away from the wetland, the proposed buffer compensation is designed to enhance function and value of the entire standard buffer. This is being provided at the request of the City from meetings held on June 22, and July 7, 2017.

The water quality buffers for this critical area would not be impacted. However, the proposed site plan includes enhancements to the water quality buffer: approximately 3,595 square feet of the site's existing lawn area will be restored and enhanced with full native forest plantings per the proposed buffer compensation plan (Figure 7).

Habitat buffer impacts to Wetland 18 are unavoidable for the following reasons:

1) the existing school must remain open for business requiring the proposed school building be built adjacent to the existing school;

2) Portions of the existing school, playground, and mowed maintained lawn are already located within the buffer;
3) structural elements, existing forested areas, and existing landscape necessitate construction of the school in the proposed location (i.e. size, shape, topography of the site dictate that no other reasonable or practicable alternative exists);
4) the applicant desires to retain as much of the existing forested areas as possible to protect several large native trees located in the habitat buffer as well as contiguous to and outside of the prescriptive buffer (i.e. retain existing vegetation to offset habitat loss);
5) per fire code requirements, the fire lane is required to wrap around the rear of the building to provide the fire department emergency access in the event of a fire.

As discussed previously, the existing functions provided by the wetland buffer on the east northeast side of the drainage divide are significantly degraded under current conditions due to the presence of mowed lawn and gravel/paved pathways and play areas that extend to the wetland's water quality buffer boundary (Figure 5). As a result, this portion of the buffer currently does not provide more than a minimal level of buffer functions such as sediment and nutrient removal, fish or wildlife habitat, and screening of the wetlands from noise and light intrusions.

The proposed buffer compensation plan involves the removal and partial re-grading and soil improvements of approximately 84,240 square-feet of building and hardscape areas and portions of the existing lawn located within the habitat buffer and approximately 3,595 square feet of water quality buffer that currently is lawn area on the eastern side of the site. Disturbance of the habitat buffer is primarily to provide a fire lane for emergency access, orient stormwater and parking outside of the buffer, move play areas outside of the buffer, and also to orient the proposed building in a location on site that provides for the least amount of impact to natural areas. This would involve the removal of approximately three conifer trees ranging in size from 24 inches to 30 inches diameter breast height (dbh) (Figure 6 and 7) and approximately 14,055 square feet of vegetated areas within the standard buffer. Elimination of this portion of the standard wetland habitat buffer (i.e., lawn areas and impervious hardscaped areas) would likely reduce the wildlife functions provided by the buffer to a very small degree, if any. Since these areas provide very limited habitat functions, only those species adapted to utilizing these urbanized type spaces would be temporarily affected during construction. The majority of this area would not affect hydrological and water quality functions of the buffer, as most of the proposed clearing is outside of the contributing basin of the wetland and existing impervious areas within the drainage basin are being converted to native planting areas.

7.0 HABITAT MANAGEMENT PLAN

Under City of Bainbridge Island (2017a) Municipal Code (COBIMC) 16.50, the City recognizes that in some cases it may not be possible to provide a critical area buffer that meets the prescribed standard buffer widths required under City code. Under COBIMC 16.50(C), impacts to the habitat buffer for critical areas are allowed provided that the applicant provides a Habitat Management Plan (HMP) that demonstrates that greater protection of functions and values of the critical area would be achieved through the HMP than would be achieved through providing the prescribed standard buffers. As previously mentioned, impacts to the water quality buffer for critical areas are not allowed.

HMP's are primarily intended as a means to restore or improve buffers that have been degraded by past activity (City of Bainbridge Island 2017a). The City of Bainbridge Island (2017a) requires that the HMP incorporate elements that specifically address, as appropriate, the following:

- Enhancement of existing degraded buffer area and replanting of the disturbed buffer area with native or equivalent vegetation (see Figure 7, Figure 8, and Mithun Landscape Plans dated July 11, 2017);
- The use of alternative on-site wastewater systems in order to minimize site clearing;
- Infiltration of stormwater where soils permit;
    - According to Mithun, all stormwater will be managed and re-directed from impervious surfaces to approved stormwater management facilities located outside of and west of the standard critical areas buffers.
- Retention of existing native or equivalent vegetation on other portions of the site in order to offset habitat loss from buffer reduction; and
    - The proposed site plan is designed to avoid disturbance of any existing contiguous accessible forested areas on the site. Three trees will be removed in the habitat buffer to construct the proposed school building. However, mitigation plantings are provided as detailed on Figure 7 and Mithun's Landscape Plans to significantly off-set this loss.
- The need for fencing and signage along the buffer edge.
    - Signage will be provided as directed by the City per (2017a) code. Raedeke Associates Inc. has provided a recommended location of such fencing as shown by the proposed "Native Growth Protection Area, NGPA, Fence Location" (Figure 7). The final location, materials, and spacing of signage and fencing will be determined and agreed upon between the Bainbridge Island School District (applicant) and the City of

Bainbridge Island Planning and Community Development (critical areas jurisdictional authority).

The proposed construction of a new school building and associated school facilities, water interconnections and trail facilities meets the necessary criteria for a reduction of the habitat buffer for Wetland 18 through implementation of a HMP. The HMP incorporates the following mitigation measures:

1) Enhancement of degraded on-site portions of the Wetland 18 buffer through installation of native trees, shrubs, low cover, no-mow, and low-mow areas;
2) Removal of Himalayan blackberry from the on-site wetland buffer located on the site property where areas are to be planted;
3) Implementation of stormwater management on a site that does not currently have any stormwater management;
4) Construction of the fire lane with a combination of grass and concrete to promote infiltration of runoff within the wetland basin;
5) Installation of trails limited to 5-feet wide within the buffer will be oriented to avoid tree removal and be constructed of pervious materials (i.e. mulch);
6) Native understory vegetation would be retained to the greatest extent feasible during construction;
7) Invasive species would be removed in all locations of buffer disturbances;
8) The new proposed trails and learning areas would be for educational purposes within the buffer and restricted to those conditions and requirements allowed under the City of Bainbridge (2017a) code.

The HMP requires installation of fencing and/or signage along the buffer edge at the request of the City of Bainbridge Island Planning and Community Development. Demarcation of the proposed wetland buffer, if accepted, will adhere to the minimum requirements per Bainbridge Island (2017a) Municipal Code.

Implementation of these measures would result in increased habitat function for the wetland buffers by (1) improving screening of the wetland from noise and light intrusions from the school and associated outdoor activities, (2) increasing area within the buffer that provides forage and nesting for wildlife, (3) increasing large woody debris recruitment to wetland to improve water quality, (4) protecting large coniferous trees that are suitable for cavity nesting birds and mammals, (5) maintaining groundwater discharge to Wetland 18. In addition, it would also improve and further protect the wetland for reasons previously stated by establishing a more natural and native buffer within the wetland drainage basin.

8.0 MITIGATION

This wetland buffer mitigation plan has been prepared in compliance with all applicable sections of the City of Bainbridge Island (2017a) Municipal Critical Areas code.

For purposes of understanding the buffer compensation proposed (compensatory mitigation) herein, its value and function to protect the wetland unit (Wetland 18), and the requirements by City of Bainbridge Island (2017a) Municipal Critical Areas code, we discuss the buffer conditions and characteristics throughout this report in the following manner:

1. Prescriptive or Standard Buffer: the buffer measured on a horizontal plane from the regulated wetland edge as marked in the field City of Bainbridge Island (2017a) Municipal Code (COBIMC 16.20.160 Wetlands D. Development Standards. 8. Buffer Measurement). Note that for this project site, the prescriptive buffer of 300 linear feet from the wetland edge includes both areas that topographically drain surface water toward the wetland unit as well as away from the wetland unit. It is important to keep this distinction in mind when trying to understand the overall function and value that the buffer provides toward protecting the wetland unit.
2. Functional Buffer: the portions of the buffer located within the drainage basin of the wetland unit (Wetland 18). This is the land surface of the site that collects stormwater and flows into the wetland (see figures 5, 6, and 7).

Mitigation provided herein provides compensatory buffer areas and solutions for the unavoidable impacts described in Section 6 of this report. The buffer compensation areas are provided to offset the calculated impacts to the entire standard buffer area regardless of its function to protect Wetland 18. Multiple forms of compensation are provided in order to best achieve the COBI (2017a) requirement of no net loss. The information provided in this report is designed to support the following compensation requirements. Note that these are typical to direct wetland impacts, which this project proposes no direct impacts to Wetland 18:

1. Demonstrate sufficient scientific expertise, supervisory capability, and financial resources to carry out the project,
2. Demonstrate the capability for monitoring the site to make corrections and implement appropriate adaptive management techniques to ensure buffer compensation success, and
3. Provide long-term protection and management of the compensation area to avoid further development and/or degradation of the critical area.

The City of Bainbridge Island (2017a) Municipal Code (Section 16.20 Critical Areas H. Wetlands and Streams Restoration, Creation, Mitigation, or Enhancement 5. Acreage Replacement Ratio b) states that replacement ratio for buffers shall be 1:1. Buffer compensation described herein for this project actually provides compensation in excess of the required 1:1 ratio per code.

Based on the loss of vegetated area located within the standard buffer, 14,055 square feet, this plan offers approximately 20,096 square feet up for preservation of forested area contiguous to the forested portions of the habitat buffer. Furthermore, additional forested area located immediately north of this is also protected from certain development activities as a designated building set-back. This set's aside nearly the entire contiguous forested areas existing along the northern property boundary in excess of the required COBIMC 1:1 buffer replacement ratio.

For reasons described in Section 4.4 and throughout this report, the additional vegetative enhancement proposed in the remainder of the standard buffer only further enhance the value and function of the proposed buffer when compared to the existing buffer.

8.1 MITIGATION SEQUENCE

Mitigation has been defined by the State Environmental Policy Act (SEPA) (WAC 197-11-768; cf. Cooper 1987), and more recently in a Memorandum of Agreement between the Environmental Protection Agency and the U.S. Army Corps of Engineers (Anonymous 1989). In order of desirability, mitigation may include:

1. ***Avoidance*** - avoiding impacts by not taking action or parts of an action;

2. ***Minimization*** - minimizing impacts by limiting the degree or magnitude of the action and its implementation;

3. ***Compensation*** - which may involve:

    a) repairing, rehabilitating, or restoring the affected environment;

    b) replacing, enhancing, or creating substitute resources or environments;

    c) mitigation banking.

8.1.1 Avoidance and Minimization of Impacts

The proposed development plan was designed to avoid direct impacts to wetlands and to limit disturbance of native vegetation areas both in and outside of standard buffer areas as much as possible. The proposed development plan incorporates a number of design

features that would avoid or minimize impacts to the wetlands and their buffers, including:

- Direct impacts to wetland areas or streams would be avoided;
- The proposed stormwater plan would infiltrate run-off from all existing and new impervious surface to minimize wetland and stream impacts.
- Removal of native vegetation within the wetland and forested areas of the buffer would be avoided;
- All other construction areas would be within existing lawn or roadways and would not require the removal of native vegetation;
- Temporary erosion and sediment control (TESC) measures would be installed during construction and would utilize appropriate best management practices (BMPs) designed to prevent sediment from entering surface waters or wetlands during and after construction, including placement of straw bales and silt fencing between work activities and adjacent wetlands;
- All potentially hazardous material (e.g., fuel, lubricating fluids) would be stored within the designated staging area, and no fueling or servicing of construction vehicles would be permitted within the wetland or stream buffers;
- Upon completion of the project, the areas disturbed during construction that are not converted to permanent development features shall be re-graded to be compatible with the natural terrain and replanted with grass to prevent erosion.

8.1.2 Compensatory Mitigation

Direct wetland impacts would be avoided under the proposed development plan; therefore, wetland mitigation by creation, re-establishment, rehabilitation, or enhancement is not proposed nor required as part of this study.

Approximately 14,055 square feet of the Wetland 18's standard prescriptive buffer consisting of compacted mowed lawn, building and hardscape areas would be impacted in order to construct the proposed project (Figure 6). Conservatively, this loss in vegetated standard buffer area calculation assumes the proposed fire lane is impervious in its proposed design providing a conservative estimate of overall standard buffer impacts. However, the proposed design intends to use a combination of grass and concrete pervious materials for the fire lane to promote infiltration of runoff.

To off-set the loss of wetland buffer totaling approximately 14,055 square-feet of vegetated area lost in the proposed design, the overall wetland buffer would be enhanced by planting native trees, shrubs, low cover, and no mow zones (Figure 6 and 7) and an additional area of habitat preservation is being provided along the northern portions of the project site. Of this area, approximately 24,010 square feet of habitat buffer area and 3,595 square feet of water quality buffer will truly serve to protect the wetland unit

because it is in the wetland drainage basin. The part of the water quality buffer that is currently mowed and maintained lawn areas (approximately 3,595 square feet) will be improved and re-established with plantings of native trees and shrubs (Figure 7). Portions outside of the existing utility (water line) easement would be planted with full native forest plantings, and the portions within the utility easement would be planted with native low cover (Figure 7). Other non-forest portions of the buffer northeast of the proposed building would be planted with a combination of no mow and meadow mix plantings (Figure 7).

The remaining portions of the standard buffer area will provide an overall functional lift to the standard buffer by protecting the areas that it drains toward outside of the critical area buffer. The areas draining away from Wetland 18 consist of the remainder of the developed school property. However, the area that does not drain toward Wetland 18 will also provide contiguous habitat to the area serving to protect Wetland 18. Figure 7 depicts a proposed native growth protection area specifically designed to provide functional and valuable protection of Wetland 18 from its existing condition during construction and is designed to be installed concurrent with the anticipated buffer impacts associated with project construction. The limit of work line demarcates the limits that the contractor needs to build the project.

The proposed buffer compensation, enhancement, and restoration areas are presented on Figure 7 of this report, with proposed general notes and conditions for establishment on Figure 8, and based on Mithun's Landscape plans provided July 11, 2017. Detailed information regarding the proposed vegetation may be viewed on Mithun, Inc.'s landscape plans. Agreed upon planting schedules provided to Raedeke Associates Inc. by Mithun on July 11, 2017 are included as Appendix E.

The proposed location of the buffer compensation areas will re-connect areas previously forested before the existing school was constructed in the 1960's as well as provide additional functional and valuable habitat areas within the wetland buffer once established. Many of these functions and values are described in previous sections of this report. In summary, the improvements of the existing water quality buffer, improvements to the overall available areas for re-vegetation on the proposed site plan (Figures 6 and 7), and the proposed area to be dedicated as habitat preservation, the habitat management plan presents areas that enhances the existing buffer and provides areas greater than the prescriptive buffer required by code.

The areas to be planted with no-mow grassland (Figure 7) are considered an enhancement over current conditions of mowed lawn and existing gravel and paved play areas. Generally speaking, scientific literature (Granger et al. 2005) describes the benefits of a Low-mow and/or a No-mow zone in some of the following ways. In addition, scrub-shrub and mixed forest areas provide enhanced functions and values compared to no-mow areas. Nonetheless, enhanced function and value is provided by land cover types (vegetation) described and proposed herein when compared to existing conditions.

Specifically, the project is designed in a manner geared toward providing the following potential enhanced functions and values for no-mow grassland areas, as well as other native low cover, when compared to the existing conditions (see photos in Appendix D) described in this report:

1. Certain species depend on grasslands for cover, breeding, and food.
2. Allowing nature to progress through succession, such as letting grass grow to it's mature state, lets nature function and return to a more natural state.
3. Un-mowed areas provide cover by sheltering various species, providing camouflage to protect themselves from predators. Mowed areas leave them exposed and susceptible to predation.
4. Butterflies and bees prefer these un-mowed areas as their source of food and to provide locations to lay eggs.
5. These areas provide excellent habitat for pollinators, allowing plants to flower and thrive.
6. Certain insect species use the undisturbed soils areas as a nesting place.
7. These areas can improve water quality through the filtering of pollutants such as fertilizers and pesticides that may otherwise reach Wetland 18. As a no-mow or low-mow area, grass and flowering herbaceous species (including trees and shrubs) provide more surface area to interact with the environment.
    - Atmospheric deposition in the form of rain and/or dust are given more surface area to interact with providing more opportunity for the species to filter and process excess nutrients and/or pollutants that would otherwise reach the wetland. In other words, increased biomass results in reduced nutrient/pollutant losses that would otherwise be introduced into Wetland 18.
8. These areas can stabilize soils and reduce erosion.
9. These areas slow stormwater runoff, allowing water more residence time with the plant species to filter pollutants.
10. These areas are more cost-effective, with less fuel expenses, requiring less water, no fertilizers are needed, and fewer hours of labor for maintenance. Reduced mowing results in a reduced carbon footprint (i.e. lower emissions) if using a gas-powered mower.
11. These improvements, altogether, enhance overall biodiversity and encourage healthier soils because differing plants have different root structures that vary in depth, size, and type.

12. Space definition and biodiversity of fully vegetated areas consisting of varying strata (herbs, shrubs, trees) can improve habitat ability to fend off invasive species in certain circumstances.

By regularly mowing areas to maintain lawns and allowing frequent disturbances in the form of recess that is currently happening on the existing site, functions and values are greatly reduced. For example, by mowing grass we effectively trap the plant species in a state of immaturity never giving the species an opportunity to function at its most efficient and mature state. Cut grass spends its immediate subsequent energy in repairing the cut rather than continuing to service the ecosystem in which it exists.

By moving the existing play areas outside of the buffer in the proposed design, the project only further improved buffer and screening of Wetland 18 from noise pollution that may impact species which utilize the area.

8.2 MITIGATION GOALS AND OBJECTIVES

The overall goal of the compensatory mitigation is to increase the existing level of protection provided by the buffer for wetland functions but also to increase overall function and value of the standard buffer regardless of its ability to protect the wetland unit. The enhanced wetland buffer is designed to be a low maintenance, self-sustaining community resembling native habitat typical of the Puget Sound lowlands. Evaluation and performance standards for these goals are found in Section 8.5.

The specific objectives of the buffer enhancement plan are:

1) Remove Himalayan blackberry, protect existing native trees and understory, and install varying native species land covers in an area up to approximately 44,065 square feet of the standard buffer for Wetland 18. Proposed land covers will consist of native meadow and no-mow fescue seeded areas portions of which will include some trees, and install a full native northwest forest within the water quality buffer with native understory and shrub plantings within the existing water line easement (See Mithun, Inc. Landscaping Plans, Figure 6, and Figure 7);
2) Install native plantings per the proposed buffer compensation plan (Figure 7), and per the Landscape Plans and technical specifications designed by Mithun;
3) Remove Himalayan blackberry and other nuisance and invasive species within all areas proposed for enhancement and restoration located within the buffer and on site (Figure 6 and 7);

8.3 BUFFER AND WETLAND ENHANCEMENT PLAN IMPLEMENTATION

The buffer and wetland enhancement plan would be implemented concurrently with construction of the proposed building and site improvements to the extent feasible. Part

of the proposed buffer area, depending on site conditions during construction may be needed temporarily as play areas until the new building and old building construction phases are completed.

8.3.1 Site preparation

Prior to site preparation, the limits of the buffer planting area would be clearly marked (staked) in the field by appropriate means with the assistance of the project biologist. Generally speaking, soil amendments, soil decompaction greater than or equal to 1-foot depth, grass removal, and mulching the entire planted area will be the minimum extent of site preparation.

8.3.2 Plant Species Composition

Tree and shrub species selected for the buffer enhancement plan are those that commonly occur in riparian vegetation communities in the vicinity of the project site. Tree and shrub plantings would consist of western red cedar, douglas fir, western hemlock, pacific dogwood, vine maple, serviceberry, red flowering currant, oceanspray, salal, snowberry, low Oregon grape, western sword fern, a no-mow meadow mix depicted on Figure 8, and a low-mow fescue mix (Figure 7, attachment E, and Mithun, Inc.'s Landscaping Plans and technical specifications).

8.3.3 Plant Specifications, and Installation

All plant materials would be locally grown and be of local provenance. Tree stock would be two-gallon container-grown, 3- to 4-feet tall, and well-rooted and branched. Trees would be planted on 12-foot centers within the in-fill areas and the full native forest planting areas (Figure 8 and Attachment E). Shrub stock would be one-gallon container-grown, 18- to 24-inches tall, well-rooted and branched. Shrub plantings would be spaced on 5-foot centers. Shrubs would be planted within all areas of the proposed buffer compensation.

All plantings would be installed in pits that are approximately twice the diameter of the root ball. Plantings would be installed so that the top of the root ball is approximately flush with grade in order to avoid smothering the trees and shrubs during mulch installation. Mulch consisting of of organic material would be installed for all planted trees and shrubs. Mulch would be installed for the entire planted area at two to three inches in depth.

The project biologist would review and approve plant materials, soil amendment, and mulch for quality and quantity, as well as review and approve plant locations and supervise installation procedures.

8.3.4 Planting Schedule

Planting would occur between October 1 and March 1 to take advantage of seasonal rains and greater availability of plant material. Planting at any other time or during periods of abnormally hot, dry, or freezing weather conditions would not occur without prior

approval by the project biologist and may require plant substitutions and supplemental irrigation.

8.3.5 Site Maintenance

The enhanced wetland buffer is designed to be self-sustaining. To ensure the success of the plantings, additional replanting and control of undesirable plant species may be necessary after initial installation. Invasive species would be controlled by methods that do not compromise the rest of the buffer plantings. Manual removal of invasive species is preferred, but does require early detection and action to be effective.

Temporary irrigation of plantings would be provided during the first two years after installation to ensure plant survival. All trees and shrubs that die over time would be removed and replaced after Year 1 or per the City's requirements and/or Mithun's specifications whichever is the most comprehensive to meet the performance standards described herein. During subsequent years, additional dead or dying plants may be replaced at the project biologist's direction if it is determined to be necessary in order to meet specific mitigation performance standards. Irrigation would need to be installed as appropriate to ensure the installed plantings are adequately watered during the site maintenance period.

8.3.6 Critical Area Location Recording

Wetland 18 and its buffers will be recorded with the City of Bainbridge Island. The proposed designated buffer limit is shown on Figure 7 as the "natural growth protection area."

8.4 MONITORING PROGRAM

Because of the variable success of wetland mitigation projects in the Pacific Northwest, the City of Bainbridge Island code requires that mitigation areas be monitored in order to evaluate their success in replacing lost wetland values and functions. Therefore, this plan includes a systematic monitoring program of the enhanced upland buffers to evaluate the success of the mitigation efforts. The results of the monitoring will be used to develop modifications, if needed, to the mitigation plan in subsequent years.

The purposes of the monitoring program are as follows: (1) to document physical and biological characteristics of the enhanced wetland buffers, and (2) to ensure that the goals and objectives comply with permit specifications (Josselyn et al. 1990).

The monitoring process would consist of three distinct phases: (1) construction monitoring; (2) compliance monitoring; and (3) long-term monitoring. Construction monitoring serves to ensure proper site preparation and plant placement relative to actual site conditions. The "time-zero" or baseline composition, and cover abundance would be documented during the compliance monitoring phase. The long-term monitoring program would document the survival of planted vegetation and rates of colonization by

other plants over a minimum seven-year period after implementation of the mitigation plan is complete per City of Bainbridge Island (2017a) code.

8.4.1 Construction Monitoring

The project biologist would be present on-site during the various stages of construction in order to: (1) demark the limits of the areas to be planted; (2) review and approve the plant materials and recommend their final placement before planting; (3) make adjustments in planting plans, as needed, in response to field conditions; (4) ensure that construction activities are conducted per the approved plan; and (5) resolve problems that arise during construction, thus lessening problems that might occur later during the long-term monitoring phase.

8.4.2 Compliance Monitoring

Compliance monitoring consists of evaluating the buffer enhancement area immediately after grading and planting activities are completed. The objectives would be to verify that all design features, as agreed to in the buffer enhancement planting plan, have been correctly and fully implemented, and that any changes made in the field are consistent with the intent and the design of the approved plan. Evaluation of the planting areas after implementation would be done by the project biologist using evaluation standards and criteria detailed in Section 8.5.

After planting of the buffer is completed, fixed sample plots would be established within areas representative of the plant communities being sampled. The same sample plots would be utilized during each subsequent monitoring of the site during the seven-year long-term monitoring. These sample plots may be located randomly or along specific transects, depending upon-site conditions. During compliance monitoring, a quantitative assessment of the plants established in the wetland and buffer would be recorded in representative sample plots for baseline data. Photos would be taken from each sample plot. This information would be used to document “time-zero” conditions from which the long-term monitoring period would begin.

The compliance monitoring phase would conclude with the preparation of a brief compliance report by the project biologist. The report would document whether all design features have been correctly, fully, and successfully implemented. Substantive changes made in the planting plans would be noted in the compliance report and on the drawings for use during the long-term monitoring phase. Locations of monitoring sample plots established for the compliance monitoring would be identified on the as-built plans.

The planting plans along with the compliance report, would document “as-built” conditions at the time of construction compliance. The compliance report and as-built plan would be submitted to City of Bainbridge Island for review and approval.

8.4.3 Long-Term Monitoring

The long-term monitoring program will begin following approval of the mitigation compliance monitoring report and would be conducted over a seven-year period during

years 1, 2, 3, 5, 7, along with off-year spring site checks. Long-term monitoring would evaluate the establishment and maintenance of the plant communities in the enhanced wetland buffer to determine if the goals and objectives of the mitigation plan have been met.

At each sample plot, plant species would be identified, and the combined areal cover for all native planted and volunteer woody species would be estimated. In addition, plant counts would be made following completion of the first and second growing seasons and all subsequent monitoring years in order to document the overall percent survival of the tree and shrub plantings. Plant identifications would be made according to standard taxonomic procedures described in Hitchcock and Cronquist (1976), with nomenclature as updated by the U.S. Army Corps of Engineers National Wetland Plant list (Lichvar et al. 2016).

Photos would be taken within the mitigation planting areas during each monitoring year (years 1, 2, 3, 5, and 7 and along with off-year spring checks). Photographs would be taken from locations established during the compliance monitoring site visit.

8.4.4 Monitoring and Reporting Schedule

Formal monitoring of the enhanced wetland buffer would occur at the end of the growing season (late-August or September). In addition, during the first two growing seasons, the project biologist would also evaluate the mitigation site during spring and mid-summer to assess site progress and to determine whether maintenance is needed to ensure success of the buffer enhancement areas in attaining the goals and objectives of the mitigation plan.

Monitoring reports would be prepared following the completion of the growing season and submitted to the City of Bainbridge Island for review and approval. The long-term monitoring period will commence following acceptance of the compliance report and "as-built" drawings by the City.

Monitoring reports would be submitted to the City of Bainbridge Island as soon as possible after the monitoring has been completed, with a target date of December 31 of each monitoring year. The report would document conditions within the enhanced areas and make recommendations for correcting any problems encountered.

8.5 Evaluation and Performance Standards

Specific performance standards to be used in the seven-year long-term monitoring are the following based on Figure 7 of this report:

Area 1 – Wetland Buffer Enhancement & Restoration with Full Native Forest Plantings and Native Understory & Shrubs proposed within the Water Quality Buffer

- 100% survival of all planted trees, shrubs, and low cover following completion of the first year after planting;
- 90% survival of all planted trees, shrubs, and low cover following completion of the second year after planting;
- 80% survival at the end of Long-term monitoring;
- Total Coverage by shrub and tree species (volunteer and planted individuals) will be the following:
    - at least 5% after one year;
    - at least 10% after two years;
    - at least 20% after three years;
    - at least 40% after five years;
    - at least 50% after seven years;
- Cover of Himalayan blackberry, English Ivy and all other nuisance and invasive species recognized by the City of Bainbridge Island will not exceed 10% within the buffer restoration areas at any time during the long-term monitoring.

Areas 2 & 3 – Wetland Buffer Enhancement & Restoration within the Meadow Mix and mixed Meadow Mix and Tree Areas

- 100% survival of all planted trees following completion of the first year after planting;
- 90% survival of all planted trees following completion of the second year after planting;
- 80% survival at the end of Long-term monitoring;
- Total Coverage by seeded area (while allowing for native volunteer and planted individuals) will be the following:
    - Maintaining any required TESC BMP measures for the duration of the establishment period;
    - at least 70% after year one;
    - over-seeding as necessary to facilitate establishment during subsequent growing seasons;
    - fully established, at least 85-90% coverage or more, by year three; and
    - maintained to the end of Long-term monitoring;
- Cover of Himalayan blackberry, English Ivy and all other nuisance and invasive species recognized by the City of Bainbridge Island will not exceed 10% within the buffer restoration areas at any time during the long-term monitoring.

Invasive Species Removal

- Cover of Himalayan blackberry, English Ivy, and all other nuisance and invasive species recognized by the City of Bainbridge Island will not exceed 10% at any time during the long-term monitoring.

9.0 LIMITATIONS

We have prepared this report for the exclusive use of the Bainbridge Island School District and their consultants. No other person or agency may rely upon the information, analysis, or conclusions contained herein without permission from the Bainbridge Island School District.

The determination of ecological system classifications, functions, values, and boundaries is an inexact science, and different individuals and agencies may reach different conclusions. With regard to wetlands, the final determination of their boundaries and buffers for regulatory purposes is the responsibility of the various agencies that regulate development activities in and around wetlands. We cannot guarantee the outcome of such determinations. Therefore, the conclusions of this report should be reviewed by the appropriate regulatory agencies.

We warrant that the work performed conforms to standards generally accepted in our field, and prepared substantially in accordance with then-current technical guidelines and criteria. The conclusions of this report represent the results of our analysis of the information provided by the project proponent and their consultants, together with information gathered in the course of the study. No other warranty, expressed or implied, is made.

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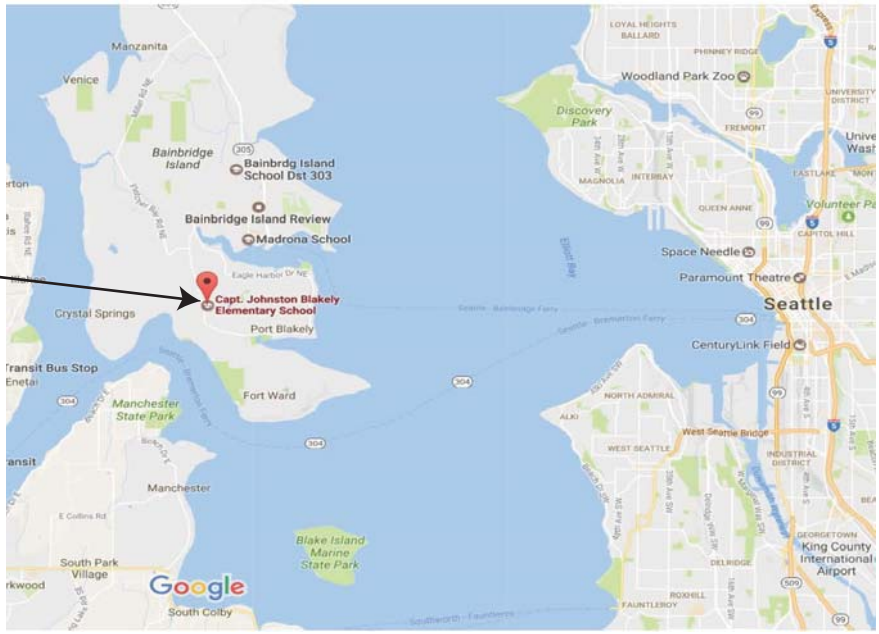
FIGURES AND TABLES

PROJECT LOCATION



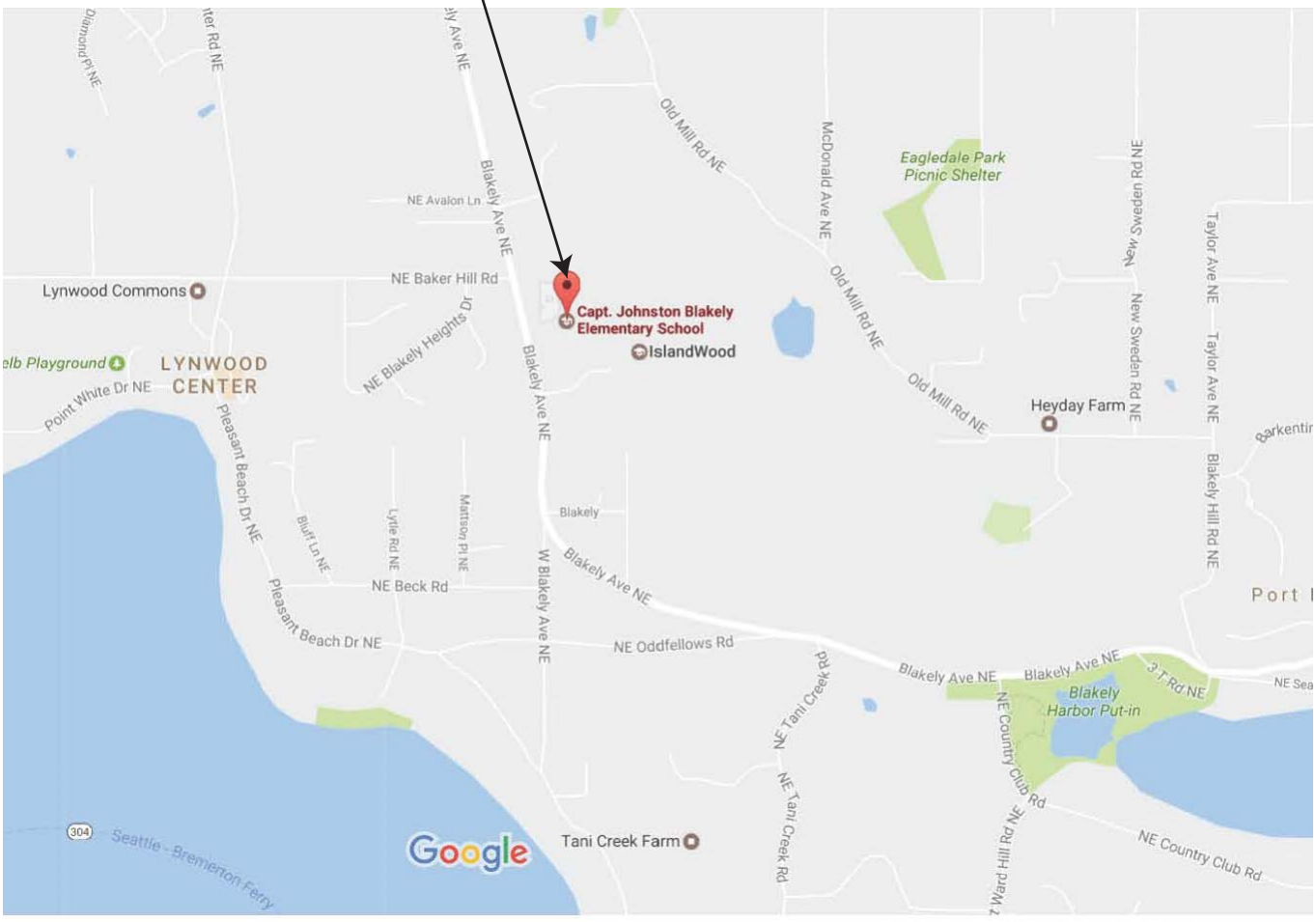


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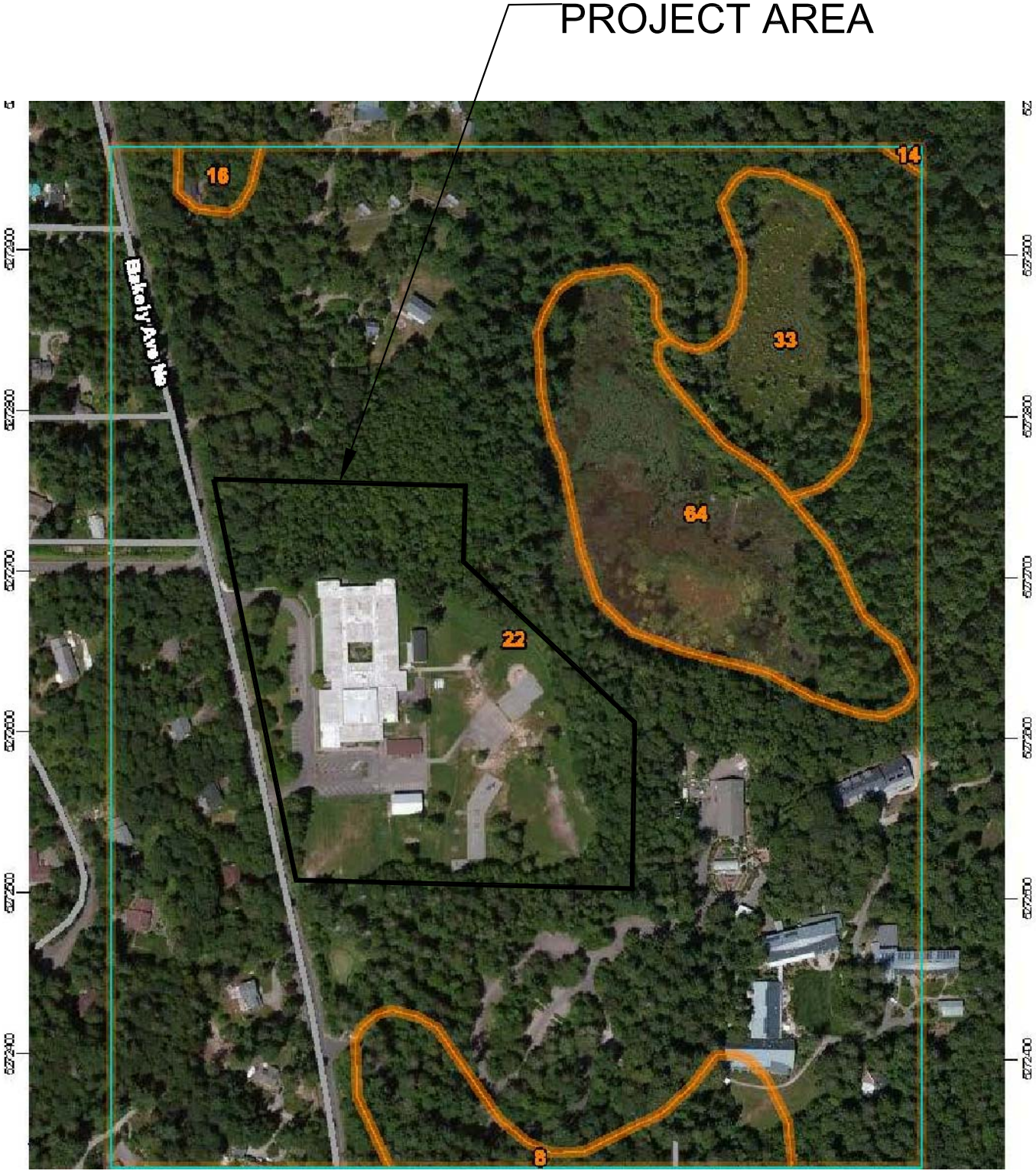
FIGURE 1

REGIONAL & VICINITY MAP

BLAKELY ELEMENTARY
BAINBRIDGE ISLAND, WA

Raedeke Associates, Inc.
2111 N. Northgate Way, Ste. 219
Seattle, WA 98133

RAI # 2017-014



T:\2017\2017-014 Blakely Elementary\2017-014 Blakely Elementary Figures.dwg

Source: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed [2017/03/09].

SOILS KEY:

22: Kapowsin gravelly ashy loam, 0 - 6% slopes
64: Water
33: Mukilteo peat
16: Harstine gravelly ashy sandy loam, 15-30% slopes
14: Harstine gravelly ashy sandy loam, 0-6% slopes
8: Cathcart silt loam, 8-15% slopes

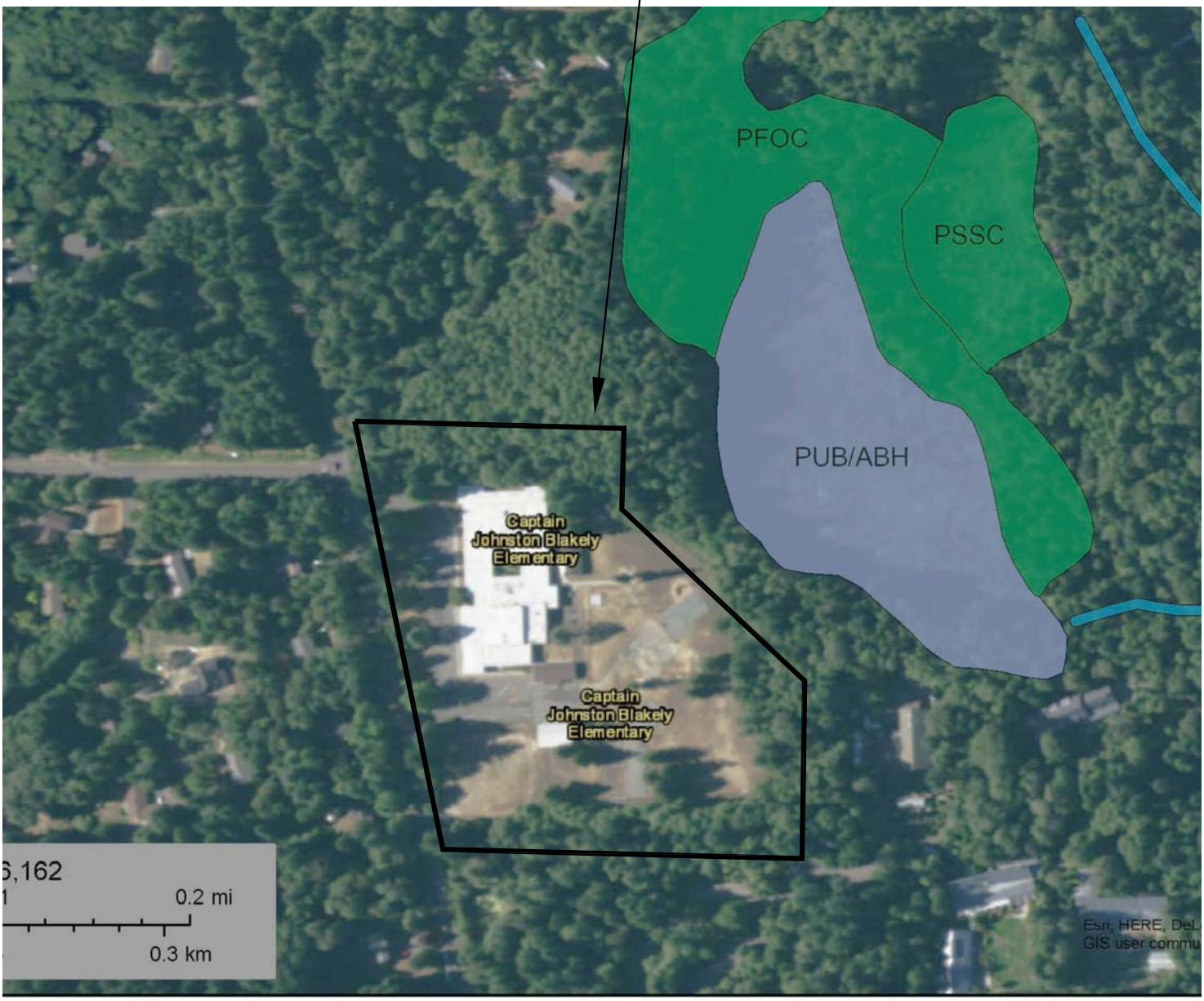
N

FIGURE 2
SOILS MAP
BLAKELY ELEMENTARY SCHOOL
BAINBRIDGE ISLAND, WA

0 150 300 600
SCALE 1"=300'

Raedeke Associates, Inc.
2111 N. Northgate Way, Ste. 219
Seattle, WA 98133

RAI # 2017-014



Source: US Fish and Wildlife Service National Wetlands Inventory, Wetlands Mapper. Available at http://www.fws.gov/wetlands/data/mapper.HTML. Accessed on 2017/03/09.

NWI WETLAND KEY:

PFOC: Palustrine, Forested, Seasonally Flooded
PUB/ABH: Palustrine, Unconsolidated bottom / Aquatic bed, Permanently Flooded
PSSC: Palustrine, Scrub Shrub, Seasonally Flooded

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

N

0 150 300 600
SCALE 1"=300'

FIGURE 3
NWI MAP
BLAKELY ELEMENTARY SCHOOL
BAINBRIDGE ISLAND, WA

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2111 N. Northgate Way, Ste. 219
Seattle, WA 98133
RAI # 2017-014

T:\2017\2017-014 Blakely Elementary\2017-014 Blakely Elementary Figures.dwg

Source: City of Bainbridge Island, WA Mapping Gallery. Available at https://cityofbi.maps.arcgis.com. (Accessed 2017-5-16).

Wetlands Habitat Buffer

Wetlands Water Quality Buffer

Kitsap County Parcel Data

Streams

- Fish
- Non-Fish Perennial
- Non-Fish Seasonal
- Shoreline Stream

Wetlands

- Delineation Available
- No Delineation Available
- Not a Wetlands

N

FIGURE 4
BAINBRIDGE ISLAND CRITICAL AREAS MAPPING
BLAKELY ELEMENTARY
BAINBRIDGE ISLAND, WA

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FIGURE 5

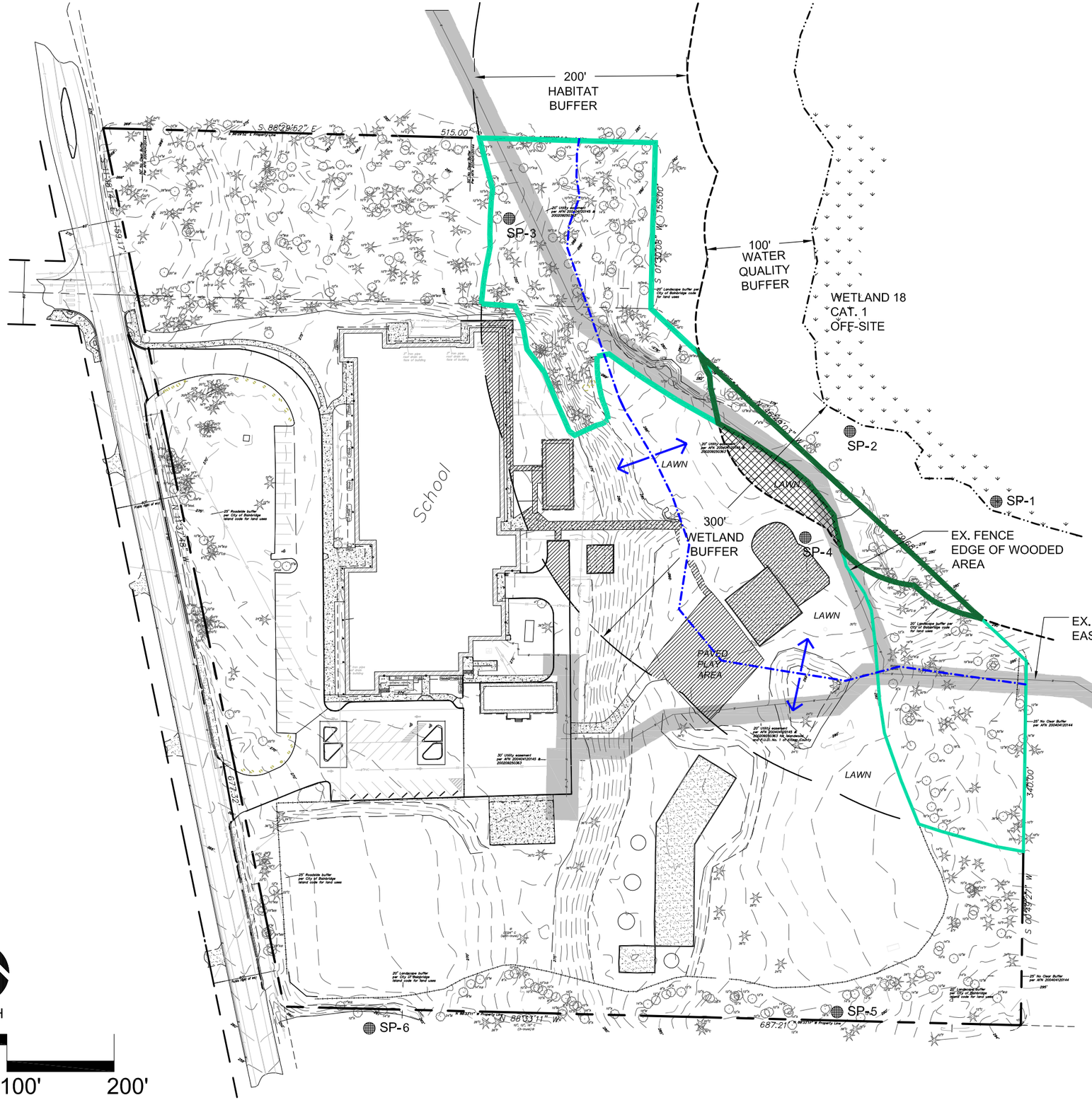
BAINBRIDGE ISLAND SCHOOL DISTRICT

BLAKELY ELEMENTARY SCHOOL

BAINBRIDGE ISLAND, WA

CRITICAL AREAS REPORT

EXISTING CONDITIONS



NORTH

0 50' 100' 200'

SCALE: 1" = 100'

LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING WETLAND
- 100' WATER QUALITY BUFFER
- 300' WETLAND BUFFER
- DRAINAGE DIVIDE
- DIRECTION OF SURFACE WATER DRAINAGE
- SP-# SAMPLE PLOT LOCATIONS (APPROX.)
- EXISTING TREES

EXISTING USES WITHIN THE WATER QUALITY BUFFER ON PROPERTY

FORESTED (EXISTING NATURAL GROWTH AREA)
8,420 SF

LAWN
3,595 SF

THE ENTIRETY OF THE WATER QUALITY BUFFER IS WITHIN THE WETLAND DRAINAGE AREA.

EXISTING USES WITHIN THE WETLAND BUFFER ON PROPERTY

FORESTED (EXISTING NATURAL GROWTH AREA)
64,120 SF
27,975 SF OF 64,120 SF WITHIN WETLAND DRAINAGE AREA

BUILDINGS & HARDSCAPE
20,145 SF
8,370 OF 20,145 SF WITHIN WETLAND DRAINAGE AREA

LAWN

LAWN & PLAY AREAS
64,095 SF
23,850 SF OF 64,095 SF WITHIN WETLAND DRAINAGE AREA

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RAI PROJECT: 2017-014

DATE: 7/18/2017

DRAWN BY:AC | PM:WH

BASE INFORMATION:

Mithun/Pier 56
1201 Alaskan Way #200
Seattle, WA 98101

LPD Engineering
1932 First Avenue, Suite 201
Seattle, WA 98101

FIGURE 6

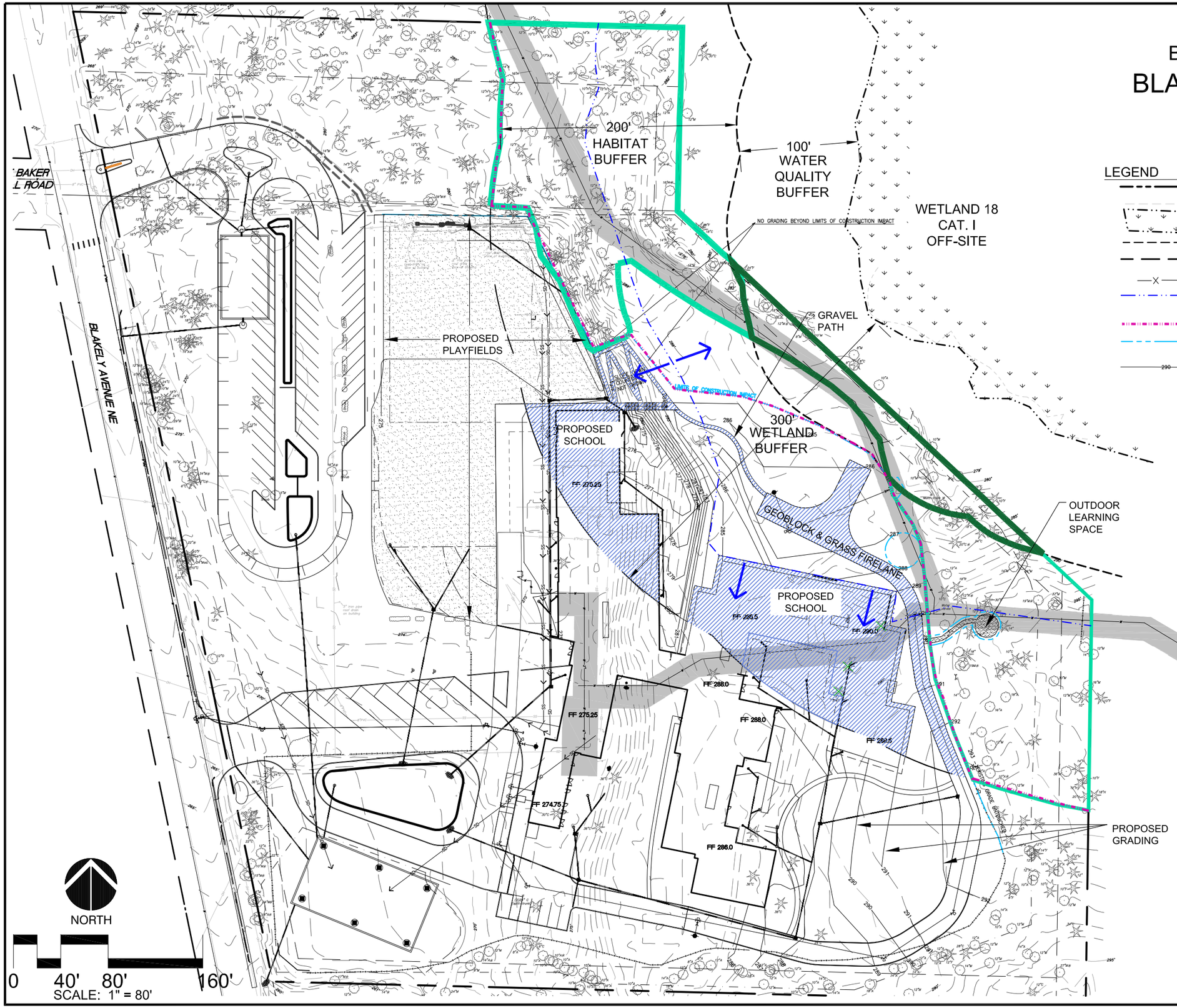
BAINBRIDGE ISLAND SCHOOL DISTRICT

BLAKELY ELEMENTARY SCHOOL

BAINBRIDGE ISLAND, WA

CRITICAL AREAS REPORT

PROPOSED SITE PLAN



LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING WETLAND
- 100' WATER QUALITY BUFFER
- 300' WETLAND BUFFER
- LIMIT OF EX. VEGETATION
- WETLAND DRAINAGE DIVIDE (POST CONSTRUCTION)
- PROPOSED NGPA FENCE LOCATION
- LIMITS OF CONSTRUCTION
- TREES TO BE REMOVED IN BUFFER
- PROPOSED CONTOURS

PROPOSED USES WITHIN THE WATER QUALITY BUFFER ON PROPERTY

FORESTED (EXISTING NATURAL GROWTH AREA)
8,420 SF

NATURAL VEGETATION AREAS**
3,595 SF

THE ENTIRETY OF THE WATER QUALITY BUFFER IS WITHIN THE WETLAND DRAINAGE AREA.

PROPOSED USES WITHIN THE WETLAND BUFFER ON PROPERTY

FORESTED (EXISTING NATURAL GROWTH AREA)
64,120 SF
27,975 SF OF THE 64,120 WITHIN WETLAND DRAINAGE AREA

BUILDINGS & HARDSCAPE*
34,200 SF
4,265 SF OF THE 34,200 SF WITHIN POST-CONSTRUCION WETLAND DRAINAGE AREA

PLAYFIELDS
9,490 SF SF
0 SF WITHIN WETLAND DRAINAGE AREA

NATURAL VEGETATION AREAS**
40,550 SF
24,010 SF OF THE 40,550 SF WITHIN POST-CONSTRUCTION WETLAND DRAINAGE AREA

* THE PERVIOUS FIRELANE WAS INCLUDED WITH THE HARDSCAPES

** SEE FIGURE 7 FOR VEGETATION TYPES

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FIGURE 7

BAINBRIDGE ISLAND SCHOOL DISTRICT

BLAKELY ELEMENTARY SCHOOL

BAINBRIDGE ISLAND, WA

CRITICAL AREAS REPORT

PROPOSED BUFFER COMPENSATION AREAS

HABITAT PRESERVATION

200' HABITAT BUFFER

100' WATER QUALITY BUFFER

300' WETLAND BUFFER

WATERLINE & EASEMENT

WETLAND 18 CAT. I OFF-SITE

PROPOSED NGPA

DRAINAGE DIVIDE

PLAYFIELDS (MOWED LAWN)

BAKER L ROAD

BLAKELY AVENUE NE

16.7

PROPOSED SCHOOL

FF 275.25

PERVIOUS FIRE LANE

10 FT. CLEARANCE AROUND WATERLINE TAP*

PROPOSED NGPA

MULCHED OUTDOOR LEARNING SPACE 486 SF

WATERLINE & EASEMENT

PROPOSED SCHOOL

FF 288.5

FF 290.0

FF 288.0

FF 288.0

FF 289.5

FF 275.25

FF 274.75

FF 286.0

FIRE LANE

0 40' 80' 160'

SCALE: 1" = 80'

LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING WETLAND
- 100' WATER QUALITY BUFFER
- 300' WETLAND BUFFER
- LIMIT OF EX. VEGETATION
- WETLAND DRAINAGE DIVIDE (POST CONSTRUCTION)
- PROPOSED NGPA FENCE LOCATION
- LIMITS OF CONSTRUCTION

PLANTING AREAS WITHIN PROPOSED BUFFER COMPENSATION & PROPOSED BUFFER HABITAT AREA

- NATIVE NORTHWEST FOREST CANOPY
  2,470 SF (ENTIRELY WITHIN WATER QUALITY BUFFER)
- UNDERSTORY & SHRUBS
  1,125 SF (ENTIRELY WITHIN WATER QUALITY BUFFER)
- MEADOW MIX & TREES
  1,960 SF (1,841 SF WITHIN THE WETLAND DRAINAGE)
- MEADOW MIX
  6,240 SF (4,724 SF WITHIN THE WETLAND DRAINAGE)
- NO MOW FESCUE
  32,270 SF (17,445 SF WITHIN THE WETLAND DRAINAGE)
- HABITAT PRESERVATION
  20,096 SF

*CONTRACTOR MAY NOT DISTURB AREAS WITHIN THE WATER QUALITY BUFFER WITH THE EXCEPTION OF THOSE AREAS AUTHORIZED BY THE CITY OF BAINBRIDGE FOR ENHANCEMENT AND RESTORATION PER THIS PLAN. THIS INCLUDES THE PROPOSED NATIVE NORTHWEST FOREST CANOPY AND THE PROPOSED UNDERSTORY & SHRUB PLANTING AREAS.

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GENERAL NOTES AND CONDITIONS

1.0 GENERAL CONDITIONS

1.1 GENERAL DESCRIPTION

FURNISH ALL MATERIALS, TOOLS, EQUIPMENT, AND LABOR NECESSARY FOR THE COMPLETION OF SITE PREPARATION AND PLANTING, AS INDICATED ON DRAWINGS AND SPECIFIED HEREINAFTER. WORK INCLUDES REMOVAL OF INVASIVE PLANT SPECIES BY HAND METHODS, PLANTING, MULCHING, AND GUARANTEE OF PLANTED AREAS AS SPECIFIED HEREIN.

1.2 CONSTRUCTION OBSERVATION / QUALITY ASSURANCE / GUARANTEE

THE PROJECT BIOLOGIST / ARCHITECT SHALL BE INVOLVED DURING THE FOLLOWING PHASES OF CONSTRUCTION: (1) ON-SITE MEETING PRIOR TO COMMENCEMENT OF WORK (PRE-CONSTRUCTION MEETING), FLAG CONSTRUCTION LIMITS FOR GARBAGE, DEBRIS, AND HARD SURFACE REMOVAL (2) APPROVAL OF INVASIVE SPECIES REMOVAL COMPLETION; (3) APPROVAL OF PLANTS, PLANTING LOCATIONS AND TECHNIQUES; AND (4) FINAL INSPECTION. PRIOR NOTICE OF 48 HOURS TO THE PROJECT BIOLOGIST FOR THE ABOVE ACTIVITIES IS REQUIRED.

APPROVAL BY THE PROJECT BIOLOGIST MUST BE RECEIVED PRIOR TO PLANT SUBSTITUTIONS. THESE MAY BE PERMITTED BASED ON PLANT AVAILABILITY.

ALL PLANT MATERIAL SHALL BE GUARANTEED FOR ONE FULL YEAR FROM THE DATE OF ACCEPTANCE OF THE WORK BY THE PROJECT BIOLOGIST. ANY DEAD PLANTED MATERIAL OR PLANTED MATERIAL THAT IS NOT IN VIGOROUS CONDITION WITHIN A PERIOD OF ONE YEAR FROM ACCEPTANCE OF THE WORK SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

THE CONTRACTOR SHALL FURNISH CERTIFICATES OF INSPECTION AND COMPLIANCE TO THE PROJECT BIOLOGIST AS REQUIRED BY FEDERAL AND STATE LAWS AND REGULATIONS FOR ALL PLANT MATERIALS AND FERTILIZERS USED IN THE PROJECT.

1.3 SITE CONDITIONS / DAMAGE / CLEANUP

THE PROJECT BIOLOGIST SHALL BE NOTIFIED IMMEDIATELY IF SITE CONDITIONS DIFFER FROM THOSE SHOWN IN THE PLANS. CARE SHALL BE TAKEN TO PROTECT THE WETLAND & UNDISTURBED BUFFER DURING CONSTRUCTION ACTIVITIES. THE MITIGATION PLANTING AREAS SHALL BE CLEARLY MARKED BY CONTRACTOR AND APPROVED BY THE PROJECT BIOLOGIST PRIOR TO THE INITIATION OF CONSTRUCTION ACTIVITIES.

ANY ITEMS NOT SHOWN IN THE PLANS, SUCH AS EXISTING BUILDINGS, EQUIPMENT, UNDERGROUND UTILITIES, WALKS, AND/OR ROADS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED AND/OR REPAIRED AT THE CONTRACTOR'S EXPENSE, IN A MANNER SATISFACTORY TO THE OWNER/CONSTRUCTION SITE SUPERINTENDANT BEFORE FINAL PAYMENT WILL BE MADE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING PLANTED AREAS FREE OF DEBRIS. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL REMOVE ALL SURPLUS MATERIAL, EQUIPMENT, AND DEBRIS FROM THE SITES. ALL PLANTED AREAS SHALL BE RAKE-CLEAN PRIOR TO MULCHING.

1.4 SCHEDULE

·ALL GRADING AND OTHER SOIL DISTURBING ACTIVITIES WITHIN THE MITIGATION AREAS, INCLUDING BUT NOT LIMITED TO REMOVAL OF ASPHALT AND OTHER HARDENED SURFACES OR REMOVAL OF INVASIVE SPECIES, SHALL OCCUR BETWEEN MARCH 1 AND OCTOBER 30 UNLESS OTHERWISE APPROVED BY THE PROJECT BIOLOGIST OR UNLESS OTHERWISE REQUIRED BY STATE OR FEDERAL AGENCIES FOR PERMITS THAT MAY BE REQUIRED FOR PROJECT IMPLEMENTATION.

·PLANTING OF WOODY MATERIAL SHOULD OCCUR BETWEEN OCTOBER 1 AND MARCH 1 TO TAKE ADVANTAGE OF SEASONAL RAINS AND GREATER AVAILABILITY OF PLANT MATERIAL. PLANTING DURING ABNORMALLY HOT, DRY, OR FREEZING WEATHER, OR AT TIMES OTHER THAN AS NOTED IS NOT ALLOWED WITHOUT PRIOR AUTHORIZATION BY THE PROJECT BIOLOGIST PRIOR TO IMPLEMENTATION AND MAY REQUIRE PLANT SUBSTITUTIONS AND SUPPLEMENTAL IRRIGATION.

2.0 PRODUCTS

2.1 TOPSOIL- IMPORTED

THE IMPORTED TOPSOIL SHALL BE FRIABLE SURFACE SOIL FROM THE A HORIZON AS DETERMINED BY THE US AGRICULTURE SOIL CONSERVATION SERVICE SOIL SURVEY. TOPSOIL SHALL BE FREE FROM: MATERIALS TOXIC TO PLANT GROWTH, NOXIOUS WEED SEEDS, RHIZOMES, ROOTS, SUBSOIL, STONES AND OTHER DEBRIS. ALL TOPSOIL SHALL PASS THROUGH A 1" SCREEN. TOPSOIL SHALL CONSIST OF A SANDY CLAY LOAM, SANDY LOAM, LOAM, CLAY LOAM, SILTY LOAM SOIL. MAXIMUM PERCENTAGES ALLOWED IN THE SOIL IS 50% SAND AND/ OR 20% CLAY. TOPSOIL SHALL BE AMENDED WITH COMPOST IF MORE ORGANIC CONTENT IS NEEDED AS DETERMINED BY THE PROJECT BIOLOGIST. CONTRACTOR SHALL PROVIDE THE PROJECT BIOLOGIST WITH A ONE POUND SAMPLE OF TOPSOIL FOR APPROVAL PRIOR TO DELIVERY TO SITE.

2.2 ORGANIC COMPOST

A WELL-DECOMPOSED, HUMUS-LIKE MATERIAL DERIVED FROM THE DECOMPOSITION OF GRASS CLIPPINGS LEAVES, BRANCHES, WOOD, AND OTHER ORGANIC MATERIALS. COMPOST SHALL BE PRODUCED AT A PERMITTED SOLID WASTE COMPOSTING FACILITY (HEALTH PERMIT, WDOE STORMWATER PERMIT, PSAPCA FACILITY, AND EQUIPMENT REGISTRATION). COMPOST MUST MEET THE DEFINITION OF “COMPOSTED MATERIALS” IN WAC 173-350-220. THIS CODE IS AVAILABLE ON-LINE AT: HTTP://WWW.ECY.WA.GOV/PROGRAMS/SWFA/FACILITIES//350.HTML

THE SOIL AMENDMENT MUST ALSO MEET THE FOLLOWING SPECIFICATIONS:

- SCREEN SIZE (APPROX. PARTICLE SZE): 3/4-INCH MAXIMUM
- MATURITY: GREATER THAN 80%
- MATURITY MEASURE (C/N RATIO): 35:1 MAXIMUM
- ORGANIC MATTER CONTENT BY DRY WEIGHT: 35% TO 80%
- MEETS CONTAMINANT STANDARDS FOR GRADE A COMPOST

2.3 PLANT MATERIALS

ALL PLANT MATERIAL SHALL BE LOCALLY GROWN AND BE OF ACCEPTED SIZE STANDARDS AS SPECIFIED IN "AMERICAN STANDARD FOR NURSERY STOCK - 2004" PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN (ANSI Z60.1-2004V). ROOTED PLANTS SHALL BE FIRST QUALITY, WELL-FOLIATED, WITH WELL-DEVELOPED ROOT SYSTEMS, AND NORMAL WELL-SHAPED TRUNKS, LIMBS, STEMS, AND LEADS. THE PROJECT BIOLOGIST/INSPECTOR SHALL INSPECT FOR QUALITY CONFORMANCE. ALL ROOTED PLANT MATERIAL SHALL BE LABELED BY GENUS AND SPECIES. PLANTS DEEMED UNSUITABLE SHALL BE REJECTED BEFORE OR AFTER DELIVERY. ALL PLANT MATERIAL SHALL BE FREE FROM DAMAGE, DISEASE, INSECTS, INSECT EGGS AND LARVAE. BARE ROOT MATERIAL MAY BE USED IF PLANT MATERIAL IS INSTALLED BETWEEN FEBRUARY- MARCH. CONTACT PROJECT BIOLOGIST FOR PLANTING DETAILS FOR BARE ROOT MATERIAL.

2.4 SEED MIX

ALL SEED MIX FOR THE MEADOW AREAS SHALL BE PURCHASED FROM *INSIDE PASSAGE SEEDS* LOCATED ON WHIDBEY ISLAND. THE MEADOW SEED MIX SHALL CONSIST OF:

10.0%	Achillea millefolium	Yarrow
4.0	Eriophyllum lanatum	Woolly sunflower
16.0	Lupinus spp.	Native blue lupine
8.0	Prunella vulgaris	Self-heal
8.0	Lomatium nudicaule	Desert-parsley
20.0	Festuca rubra	Red fescue
10.0	Festuca roemeri	Roemer's fescue
12.0	Deschampsia caespitosa	Tufted hairgrass
12.0	Danthonia californica	CA oatgrass

2.5 BARK & STRAW MULCH

BARK MULCH SHALL CONSIST OF GROUND FIR OR HEMLOCK BARK OF UNIFORM COLOR, FREE FROM WEED, SEEDS, SAWDUST, AND SPLINTERS AND SHALL NOT CONTAIN SALTS, OR OTHER COMPONENTS DETRIMENTAL TO PLANT LIFE. SIZE RANGE OF MULCH SHALL BE FROM 1/2" TO 1-1/4" WITH MAXIMUM OF 20% PASSING A 1/2" SCREEN. STRAW MULCH WILL CONSIST OF STRAW FREE FROM WEED SEEDS.

3.0 EXECUTION

3.1 SILT FENCE & TREE PROTECTION INSTALLATION

INSTALLATION OF TREE PROTECTION AND A SILT FENCE CONSISTENT WITH BEST MANAGEMENT PRACTICES, AS REQUIRED BY THE JURISDICTION PRIOR TO REMOVAL OF ANY EXISTING NON-CONFORMING STRUCTURES, SITE GRADING, OR REMOVAL OF UNPERMITTED FILL WITHIN THE WETLAND BUFFER/RIPARIAN AREA, WOULD BE PROTECTED AS SHOWN ON THE TEMPORARY EROSION AND SEDIMENT CONTROL PLAN.

3.2 GARBAGE, DEBRIS, AND HARD SURFACE REMOVAL

REMOVE ALL GARBAGE AND OTHER DEBRIS FROM THE MITIGATION AREAS. REMOVE ALL HARD SURFACES SUCH AS GRAVEL, CONCRETE, ASPHALT, AND TURF WITHIN THE PROJECT AREA. DISPOSE OF ALL DEBRIS OFF-SITE AT AN APPROVED CITY, COUNTY, OR OTHER WASTE DISPOSAL FACILITY.

3.3 INVASIVE SPECIES REMOVAL

WALK MITIGATION SITE WITH THE PROJECT BIOLOGIST TO IDENTIFY LIMITS OF INVASIVE SPECIES REMOVAL. INVASIVE SPECIES INCLUDE HIMALYAN BLACKBERRY, ENGLISH LAUREL, ENGLISH HOLLY, REED CANARYGRASS, AND OTHER INVASIVE SPECIES IDENTIFIED BY THE PROJECT BIOLOGIST. INVASIVE SPECIES WILL BE REMOVED BY GRUBBING OUT ROOT MASS. ALL NON-NATIVE, INVASIVE SPECIES INCLUDING ALL PLANT PARTS MUST BE REMOVED FROM PROJECT SITE AND DISPOSED AT A FACILITY THAT ACCEPTS YARD WASTE.

3.4 SOIL DECOMPACTION

DE-COMPACT SOILS IN ALL AREAS WHERE SOIL COMPACTION HAS OCCURRED. DECOMPACTION WILL BE ACCOMPLISHED BY SCARIFYING THE SOIL SURFACE WITH A BACKHOE, A BOBCAT OR TRACTOR WITH RIPPING TEETH OR A CULTIVATOR, DISK HARROW OR OTHER PIECE OF AGRICULTURAL MACHINERY AS APPROVED BY THE PROJECT BIOLOGIST. SCARIFY TO A DEPTH OF AT LEAST 12 INCHES SO THAT SOIL IS EASY TO DIG BY HAND.

NO SOIL SCARIFICATION SHALL OCCUR WITHIN 5 FEET OF EXISTING UNDERGROUND UTILITIES OR WITHIN THE DRIP LINE OF VEGETATION TO BE RETAINED UNLESS APPROVED BY THE PROJECT BIOLOGIST.

SOIL DE-COMPACTION IN WET SOILS AT ANY TIME OF THE YEAR OR DURING INCLEMENT

FIGURE 8

BAINBRIDGE ISLAND SCHOOL DISTRICT

BLAKELY ELEMENTARY SCHOOL

BAINBRIDGE ISLAND, WA

CRITICAL AREAS REPORT

GENERAL NOTES & CONDITIONS

WEATHER OR DURING PERIODS PROLONGED DRY OR HOT WEATHER IS NOT ALLOWED WITHOUT APPROVAL BY THE PROJECT BIOLOGIST PRIOR TO EXECUTION IN ORDER THAT SOIL STRUCTURE WILL BE MAINTAINED. SOIL SHOULD BE MOIST ENOUGH THAT DIGGING DOESN'T CREATE DUST, BUT DRY ENOUGH TO DRIVE EQUIPMENT WITHOUT CREATING RUTS.

3.5 COMPOST AMENDMENT

IN ALL DECOMPACTED AREAS, 4 INCHES OF COMPOST SHALL BE SPREAD AND WORKED INTO THE UPPER 12 INCHES OF THE SOIL.

3.6 PLANT STORAGE

PLANTS STORED UNDER TEMPORARY CONDITIONS PRIOR TO INSTALLATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. PLANTS STORED ON THE PROJECT SHALL BE PROTECTED AT ALL TIMES FROM EXTREME WEATHER CONDITIONS BY INSULATING THE ROOTS, ROOT BALLS, OR CONTAINERS WITH SAWDUST, SOIL, COMPOST, BARK OR WOOD CHIPS, OR OTHER APPROVED MATERIAL AND SHALL BE KEPT MOIST AT ALL TIMES PRIOR TO PLANTING. CUTTINGS SHALL CONTINUALLY BE SHADED AND PROTECTED FROM WIND. CUTTINGS SHALL BE PROTECTED FROM DRYING AT ALL TIMES AND SHALL BE HEELED INTO MOIST SOIL OR OTHER INSULATING MATERIAL OR PLACED IN WATER IF NOT INSTALLED WITHIN 8 HOURS OF CUTTING. CUTTINGS TO BE STORED FOR LATER INSTALLATION SHALL BE BUNDLED, LAID HORIZONTALLY, AND COMPLETELY BURIED UNDER 6 INCHES OF WATER, MOIST SOIL OR PLACED IN COLD STORAGE AT A TEMPERATURE OF 34°F AND 90 PERCENT HUMIDITY. CUTTINGS THAT ARE NOT PLANTED WITHIN 24 HOURS OF CUTTING SHALL BE SOAKED IN WATER FOR 24 HOURS PRIOR TO PLANTING. EMERGENT PLANTS SHALL BE STORED IN STANDING WATER, NOT HIGHER THAN THE CONTAINER.

3.7 PLANT INSTALLATION

PLANTING SHALL OCCUR ACCORDING TO PREVIOUSLY DEFINED SCHEDULE. PLANTS SHALL BE INSTALLED IN COMPLIANCE WITH DETAILS IN THE PLANS. SEE DETAILS PROVIDED IN THE PLANS.

IF CONTAINER STOCK APPEARS TO BE ROOTBOUND, SLASH ROOTS VERTICALLY WITH A SHARP KNIFE ALONG OUTSIDE OF BALL IN THREE (3) PLACES MINIMUM BEFORE PLANTING. SOAK DRIED ROOTBALLS IMMEDIATELY PRIOR TO AND AFTER PLANTING. CLEANLY PRUNE BROKEN ROOTS ONE-HALF-INCH OR GREATER IN DIAMETER.

PLANTS SHALL BE INSTALLED SO FINISH GRADE IS LEVEL WITH THE TOP OF ROOT BALL. PLANTS SHALL BE BACKFILLED AND WATER-SETTLED. NO COMPACTION OF BACKFILL IS TO OCCUR AROUND PLANT. ALL PLANTS SHALL BE WATERED THOROUGHLY IMMEDIATELY FOLLOWING INSTALLATION.

PLANTING LOCATIONS INDICATED ON THE PLAN ARE BASED ON ANTICIPATED SITE CONDITIONS. NO TREES OR SHRUBS SHALL BE PLANTED IN STANDING WATER.

3.8 SEEDING

SEEDING SHALL CONSIST OF SEED APPLICATION TO BARE SOIL WITHIN THE MEADOW BUFFER AREAS. SEEDING SHALL BE APPLIED IN A CONTINUOUS, UNIFORM MANNER OVER DESIGNATED AREAS AND KEPT MOIST THROUGH GERMINATION UNTIL FULLY ESTABLISHED.

3.9 STRAW AND WOOD MULCHING

NATIVE NORTHWEST FOREST CANOPY & UNDERSTORY PLANTING AREAS: IMMEDIATELY AFTER COMPLETION OF PLANTING, BARK MULCH SHALL BE SPREAD EVENLY TO A DEPTH OF 3 INCHES WITHIN THE ENTIRETY OF THE PLANTED AREA.

MEADOW MIX & TREES: IMMEDIATELY AFTER COMPLETION OF PLANTING, BARK MULCH SHALL BE PLACED IN A 2 FOOT RADIUS AROUND EACH INSTALLED TREE TO A DEPTH OF 3 INCHES. THE MEADOW SHALL BE STRAW MULCHED.

MEADOW AREAS: ALL MEADOW AREAS SHOULD BE LIGHTLY MULCHED WITH A CLEAN, WEED FREE STRAW.

3.10 NGPA SIGNS & FENCE

INSTALL NGPA SIGNS AND FENCE PER PLAN (TO BE DETERMINED).

3.11 IRRIGATION

A TEMPORARY IRRIGATION SYSTEM SHALL BE INSTALLED BY THE CONTRACTOR. THE IRRIGATION SYSTEM SHALL PROVIDE AT LEAST 1” OF WATER PER WEEK TO THE PLANTED MITIGAITON AREAS FOR TWO YEARS. WATER WILL BE PROVIDED FROM MAY THROUGH THE END OF SEPTEMBER, OR LONGER IF HOT, DRY WEATHER PERSISTS.

A WATER TRUCK MAY BE USED TO IRRIGATE THE PLANTED AT THE SAME RATE, IF A TEMPORARY IRRIGATION SYSTEM IS UNAVAILABLE.

Table 1. Probable Wetland Ratings per revised WDOE (Hruby 2014) ratings form and corresponding City of Bainbridge Island (2017) buffer standards.

Wetland or Stream	Cowardin Classification	HGM Classification	WDOE Rating (Total Score)	Habitat Function Score	Water Quality Buffer[1]	Habitat Buffer	Total Buffer
Wetland 18	PSS1/PEM1/PAB 3	Depressional	21	8	100 ft.	200 ft.	300 ft.

APPENDIX A

Field Survey Data

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

Project/Site: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017

Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 1

Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.

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

Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.606363 Long: -122.533507 Datum: Unknown

Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: Palustrine

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

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

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

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

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

Remarks: Sample Plot 1 is located within Wetland A, in the southwest corner.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m)			
1. Oemleria cerasiformis (Oso-Berry)	25	Y	FACU
2.			
3.			
4.			
5.			
	25	= Total Cover	
Herb Stratum (Plot size: 1 m)			
1. Typha latifolia (Broad-Leaf Cat-Tail)	50	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	50	= Total Cover	
Woody Vine Stratum (Plot size: 3 m)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 25

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 50	x 1 = 50
FACW species 0	x 2 = 0
FAC species 0	x 3 = 0
FACU species 25	x 4 = 100
UPL species 0	x 5 = 0
Column Totals: 75 (A)	150 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

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

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

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

Remarks:

SOIL

Sampling Point: SP 1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6+	7.5YR 2.5/2	100						cedar remnants
	2.5Y 4/1	100					Silt Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 12

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

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

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

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

Project/Site: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017

Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 2

Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.

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

Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.606442 Long: -122.534216 Datum: Unknown

Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: None

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

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

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

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

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

Remarks: Sample Plot 2 was located in an upland trail near the southwest corner of Wetland A.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 3 m)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 1 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 3 m)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 100

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

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

Remarks: There was no vegetation growing in the trail.

SOIL

Sampling Point: SP 2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 16	7.5YR 3/2	100						Hog Fuel/Bark
16+	10YR 4/1	100					Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes ☒ No ☐ Depth (inches): 18

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

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

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

Project/Site: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017

Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 3

Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.

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

Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.607089 Long: -122.535608 Datum: Unknown

Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: None

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra (Red Alder)	40	Y	FAC
2. Thuja plicata (Western Arborvitae)	30	Y	FAC
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m)			
1. Vaccinium parvifolium (Red Blueberry)	25	Y	FACU
2. Gaultheria shallon (Salal)	20	Y	FACU
3.			
4.			
5.			
	45	= Total Cover	
Herb Stratum (Plot size: 1 m)			
1. Polystichum munitum (Pineland Sword Fern)	30	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: 3 m)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 70

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 0	x 2 = 0
FAC species 70	x 3 = 210
FACU species 75	x 4 = 300
UPL species 0	x 5 = 0
Column Totals: 145 (A)	510 (B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:

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

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

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

Remarks:

SOIL

Sampling Point: SP 3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 1	10YR 4/2	100					Silt Clay	
1 - 12+	10YR 5/3	75	10YR 4/6	25	C	M	Gr. Si. Clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

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

Project/Site: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017

Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 4

Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.

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

Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.606282 Long: -122.534442 Datum: Unknown

Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: None

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

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

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

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

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

Remarks: Sample Plot 4 is located in a mowed lawn, in the school yard near the building site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 3 m)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 1 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 3 m)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

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

Remarks: Mowed lawn providing 100% cover, only Schedonorus arundinaceus (FAC) identified.

SOIL

Sampling Point: SP 4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 4/4	100					Silt Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

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

Project/Site: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017

Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 5

Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.

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

Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.605017 Long: -122.534363 Datum: Unknown

Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: None

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

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

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

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

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

Remarks: Sample Plot 5 is located south of the school, in an area of ponding in the woods.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra (Red Alder)	25	Y	FAC
2.			
3.			
4.			
	25 = Total Cover		
Sapling/Shrub Stratum (Plot size: 3 m)			
1. Oemerlia cerasiformis (Oso-Berry)	25	Y	FACU
2. Ilex aquifolium (English Holly)	10	N	FACU
3. Gaultheria shallon (Salal)	10	N	FACU
4. Rubus laciniatus (Cut-Leaf Blackberry)	10	N	FACU
5.			
	55 = Total Cover		
Herb Stratum (Plot size: 1 m)			
1. Polystichum munitum (Pineland Sword Fern)	25	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	25 = Total Cover		
Woody Vine Stratum (Plot size: 3 m)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 75

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 0	x 2 = 0
FAC species 25	x 3 = 75
FACU species 80	x 4 = 320
UPL species 0	x 5 = 0
Column Totals: 105 (A)	395 (B)

Prevalence Index = B/A = 3.8

Hydrophytic Vegetation Indicators:

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

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

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

Remarks:

SOIL

Sampling Point: SP 5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 4/3	100					Silt Loam	
8+	10YR 4/2	95	10YR 4/4	5	C	M	Silt Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks: marginal redox features lacking masses and/or pore linings sufficient to be hydric.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Observations of ponding follow 3 days of abundant rainfall in a wetter than average winter.

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

Project/Site: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017

Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 6

Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.

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

Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.604776 Long: -122.536003 Datum: Unknown

Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: None

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

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

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

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

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

Remarks: Sample Plot 6 is located between the Islandwood pond and the southern school boundary.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum (Big-Leaf Maple)	40	Y	FACU
2.			
3.			
4.			
	40 = Total Cover		
Sapling/Shrub Stratum (Plot size: 3 m)			
1. Rubus spectabilis (Salmon Raspberry)	20	Y	FACU
2. Oemerlia cerasiformis (Oso-Berry)	10	Y	FACU
3. Gaultheria shallon (Salal)	10	Y	FACU
4.			
5.			
	40 = Total Cover		
Herb Stratum (Plot size: 1 m)			
1. Polystichum munitum (Pineland Sword Fern)	25	Y	FACU
2. Urtica dioica (Stinging Nettle)	5	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: 3 m)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 70

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 0	x 2 = 0
FAC species 5	x 3 = 15
FACU species 105	x 4 = 420
UPL species 0	x 5 = 0
Column Totals: 110 (A)	435 (B)

Prevalence Index = B/A = 3.9

Hydrophytic Vegetation Indicators:

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

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

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

Remarks:

SOIL

Sampling Point: SP 6

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/2	100					Gr. Si. Loam	
6 - 8	10YR 4/4	97	10YR 4/6	3	C	M	Gr. Si. Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks: marginal redox features lacking masses and/or pore linings sufficient to be hydric

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 4

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

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

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Observations of ponding follow 3 days of abundant rainfall in a wetter than average winter

APPENDIX B

Washington Department of Ecology 2014 Wetland Rating Forms for Western Washington

Wetland name or number 18

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland 18 Date of site visit: 03/16/17

Rated by Will Hohman Trained by Ecology? ✓ Yes ___No Date of training March 2017

HGM Class used for rating Depressional/Bog Wetland has multiple HGM classes? ___Y ____N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map Google Earth, WDOE

OVERALL WETLAND CATEGORY I/II (based on functions ✓ or special characteristics ✓)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27
___✓___**Category II** – Total score = 20 - 22
_____**Category III** – Total score = 16 - 19
_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H **M** L	H **M** L	**H** M L	
Landscape Potential	H **M** L	H **M** L	H **M** L	
Value	**H** M L	H M **L**	**H** M L	**TOTAL**
Score Based on Ratings	7	5	8	20

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I** **II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** **II**
Interdunal	**I** **II** **III** **IV**
None of the above	

Wetland name or number 18

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	not incl.
Hydroperiods	D 1.4, H 1.2	" "
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	" "
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	" "
Map of the contributing basin	D 4.3, D 5.3	" "
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	" "
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	" "
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	" "

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number 18

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

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

1. Are the water levels in the entire unit usually controlled by tides except during floods?

NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**

*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 an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the 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 all** of the following criteria?

___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (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, as sheetflow, or in a swale without distinct banks,

___The water leaves the wetland **without being impounded**.

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

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

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 2 years.

Wetland name or number 18

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

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

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 the wetland unit being scored.

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 HGM 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 of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

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

Wetland name or number 18

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*. Yes = 4 No = 0	4
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* 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	2
Total for D 1 Add the points in the boxes above	11

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)? Yes = 2 No = 0	2
Total for D 3 Add the points in the boxes above	3

Rating of Value If score is: ✓ **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number 18

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland 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 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	5
Total for D 4 Add the points in the boxes above	10

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	0
Total for D 5 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___ **3 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther down-gradient. points = 1 Flooding from groundwater is an issue in the sub-basin. points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 There are no problems with flooding downstream of the wetland. points = 0	0
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** ✓ **0 = L** *Record the rating on the first page*

Wetland name or number 18

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

- ✓ Aquatic bed
- ✓ Emergent
- ✓ Scrub-shrub (areas where shrubs have > 30% cover)
- ✓ Forested (areas where trees have > 30% cover)

4 structures or more: points = 4
3 structures: points = 2
2 structures: points = 1
1 structure: points = 0

If the unit has a Forested class, check if:

____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

4

H 1.2. Hydroperiods

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 ac to count (*see text for descriptions of hydroperiods*).

- ✓ Permanently flooded or inundated
- ✓ Seasonally flooded or inundated
- ____Occasionally flooded or inundated
- ✓ Saturated only
- ____Permanently flowing stream or river in, or adjacent to, the wetland
- ____Seasonally flowing stream in, or adjacent to, the wetland
- ____**Lake Fringe wetland** **2 points**
- ____**Freshwater tidal wetland** **2 points**

4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 type present: points = 0

2

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

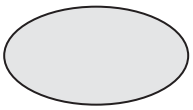
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted: > 19 species points = 2
5 - 19 species points = 1
< 5 species points = 0

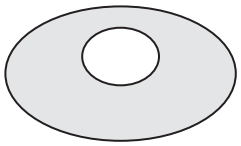
2

H 1.4. Interspersion of habitats

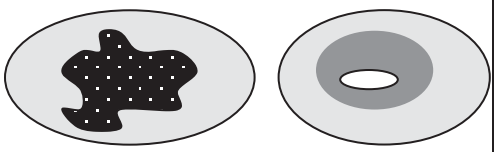
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



None = 0 points

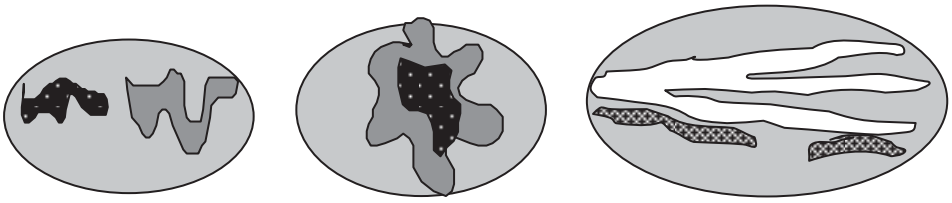


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **HIGH** = 3points



3

Wetland name or number 18

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ✓ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ✓ Standing snags (dbh > 4 in) within the wetland ___ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ✓ At least ¼ ac of thin-stemmed persistent plants 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 every stratum of plants (*see H 1.1 for list of strata*)	4
Total for H 1 Add the points in the boxes above	15

Rating of Site Potential If score is: ✓ **15-18 = H** ___ **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 6 **+** [(% moderate and low intensity land uses)/2] 9 = 15 % If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	1
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 19 **+** [(% moderate and low intensity land uses)/2] 11 **=** 30 % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	0
Total for H 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is: ___ **4-6 = H** ✓ **1-3 = M** ___ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ✓ It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	2

Rating of Value If score is: ✓ **2 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number 18

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **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 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

— **Oregon White Oak:** Woodland 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 – see web link above*).

✓ **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 – see web link above*).

— **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 – see web link on previous page).*

— **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 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), 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 > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number 18

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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 Does the wetland 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= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — 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 wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes **–** Go to **SC 2.2** No **–** Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in 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 **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **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 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

SC 3.0 - A field identified bog community is in the middle of the wetland. Aerial photo interpretation indicates that there is a bog community fringing the central open water area.

Wetland name or number 18

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA 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/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes **= Category I** No **= Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons 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 ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon**	**Cat. I**
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 aggressive, opportunistic plant species (see list of species on p. 100). — 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 wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat 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 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating**	**Cat I**
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2**	**Cat. II**
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3**	**Cat. III**
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

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APPENDIX C:

Washington Department of Transportation (2000)
Functional Assessment Data Form

Wetland Functions Field Data Form – WSDOT's BPJ Characterization *

Project: Blakely Elementary School Date: 01/17/17

Wetland Name: wetland 18 Biologist: WKH

(ref. proj. no. 2017-014)

A. Flood Flow Alteration
(Storage and Desynchronization)

		Likely or not likely to provide. (State your rationale.)
1.	Wetland occurs in the upper portion of its watershed.	Likely
2.	Wetland is in a relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall conditions.	
3.	Wetland is a closed (depressional) system.	
4.	If flowthrough, wetland has constricted outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.	
5.	Wetland has dense woody vegetation.	
6.	Wetland receives floodwater from an adjacent water course.	
7.	Floodwaters come as sheet flow rather than channel flow.	

B. Sediment Removal

		Likely or not likely to provide. (State your rationale.)
1.	Sources of excess sediment (from tillage or construction) are present upgradient of the wetland.	Likely
2.	Slow-moving water and/or a deepwater habitat are present in the wetland.	
3.	Dense herbaceous vegetation is present.	
4.	Interspersion of vegetation and water is high in wetland.	
5.	Ponding of water occurs in the wetland.	
6.	Sediment deposits are present in wetland.	

* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

C. Nutrient and Toxicant Removal

1. Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.
2. Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.
3. Wetland provides long duration for water detention.
4. Wetland has at least 30% areal cover of live dense herbaceous vegetation.
5. Fine-grained mineral or organic soils are present in the wetland.

Likely or not likely to provide.
(State your rationale.)

Likely

D. Erosion Control and Shoreline Stabilization

If associated with water course or shoreline.

1. Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.
2. A herbaceous layer is part of this dense vegetation.
3. Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.

Likely or not likely to provide.
(State your rationale.)

N/A

E. Production of Organic Matter and its Export

1. Wetland has at least 30% areal cover of dense herbaceous vegetation.
2. Woody plants in wetland are mostly deciduous.
3. High degree of plant community structure, vegetation density, and species richness present.
4. Interspersion of vegetation and water is high in wetland.
5. Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.
6. Wetland has outlet from which organic matter is flushed.

Likely or not likely to provide.
(State your rationale.)

Likely

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* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

F. General Habitat Suitability

1. Wetland is not fragmented by development.
2. Upland surrounding wetland is undeveloped.
3. Wetland has connectivity with other habitat types.
4. Diversity of plant species is high.
5. Wetland has more than one Cowardin Class, i.e., (PFO, PSS, PEM, PAB, POW, etc.)
6. Has high degree of Cowardin Class interspersion.
7. Evidence of wildlife use, e.g., tracks, scat, gnawed stumps, etc., is present

Likely or not likely to provide.
(State your rationale.)

likely

G. Habitat for Aquatic Invertebrates

1. Wetland must have permanent or evidence of seasonal inundation for this function to be provided.
2. Various water depths present in wetland
3. Aquatic bed vegetation present.
4. Emergent vegetation present within ponded area.
5. Cover (i.e., woody debris, rocks, and leaf litter) present within in the standing water area.
6. A stream or another wetland within 2 km (1.2 mi) of wetland.

Likely or not likely to provide.
(State your rationale.)

likely

H. Habitat for Amphibians

1. Wetland contains areas of seasonal and/or permanent standing water in most years. (Must be present for this function to be provided)
2. Thin-stemmed emergent and/or floating aquatic vegetation present within areas of seasonal and/or perennial standing water.
3. Wetland buffer < 40% developed, i.e., by pavement and/or buildings.

Likely or not likely to provide.
(State your rationale.)

likely

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* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

4. Woody debris present within wetland.
5. Lands within 1 km (0.6 mi) of wetland are greater than or equal to 40% undeveloped (e.g., green belts, forest, grassland, agricultural).
6. Other wetlands and/or an intermittent or perennial stream within 1 km (0.6 mi) of wetland.

Likely or not likely to provide.
(State your rationale.)

I. Habitat for Wetland-Associated Mammals

1. Permanent water present within the wetland. (Must be present for this function to be provided.)
2. Presence of emergent vegetation in areas of permanent water.
3. Areas containing dense shrubs and/or trees are present within wetland or its buffer.
4. Interspersion between different strata of vegetation.
5. Interspersion between permanent open water (without vegetation) and permanent water with vegetation.
6. Presence of banks suitable for denning.
7. Evidence of wildlife use, e.g., dens, tracks, scat, gnawed stumps, etc., is present.

Likely or not likely to provide.
(State your rationale.)

J. Habitat for Wetland-Associated Birds

1. Wetland has 30 to 50% shallow open water and/or aquatic bed classes present within the wetland.
2. Emergent vegetation class present within the wetland.
3. Forested and scrub-shrub classes present within the wetland or its buffer.
4. Snags present in wetland or its buffer.
5. Sand bars and/or mud flats present within the wetland.

Likely or not likely to provide.
(State your rationale.)

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* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

6. Wetland contains invertebrates, amphibians, and/or fish.	Likely or not likely to provide. (State your rationale.)
7, Buffer contains relatively undisturbed grassland shrub and/or forest habitats.	
8. Lands within 1 km (0.6 mi) of the wetland are greater than or equal to 40% undeveloped (e.g., green belts, forest, grassland, agricultural).	
K. General Fish Habitat (*Must be associated with a fish-bearing water.*)	Likely or not likely to provide. (State your rationale.)
1. Wetland has a perennial or intermittent surface-water connection to a fish-bearing water body	N/A
2. Wetland has sufficient size and depth of open water so as not to freeze completely during winter.	
3. Observation of fish.	
4. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.	
5. Spawning areas are present (aquatic vegetation and/or gravel beds).	
L. Native Plant Richness	Likely or not likely to provide. (State your rationale.)
1. Dominant and codominant plants are native.	
2. Wetland contains two or more Cowardin Classes.	
3. Wetland has three or more strata of vegetation.	
4. Wetland has mature trees.	
M. Educational or Scientific Value	Likely or not likely to provide. (State your rationale.)
1. Site has documented scientific or educational use.	
2. Wetland is in public ownership.	
3. Parking at site is suitable for a school bus.	

* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

N. Uniqueness and Heritage

	Likely or not likely to provide. (State your rationale.)
1. Wetland contains documented occurrence of a state– or federally listed threatened or endangered species.	
2. Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the U.S. Fish and Wildlife Service, the WDNR's Natural Heritage Program, or WDFW's Priority Habitats and Species Program.	
3. Wetland is part of a National Natural Landmark designated by the National Park Service or a Natural Heritage Site designated by WDNR.	
4. Wetland has ~~biological~~, geological, ~~or~~ other features that are ~~determined rare~~ by the local jurisdiction.	
5. Wetland has been determined significant by the local jurisdiction because it provides functions scarce for the area.	
6. Wetland is part of … ➢ an estuary, ➢ a bog, ➢ a mature forest.	may likely

* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

APPENDIX 4

Wetland Functions and Values Form

(Can be copied for use in the appendices of a report)

Wetland Functions & Values Form

Wetland I.D. 18 Project: Blakely Elem. school Assessed by: WRH

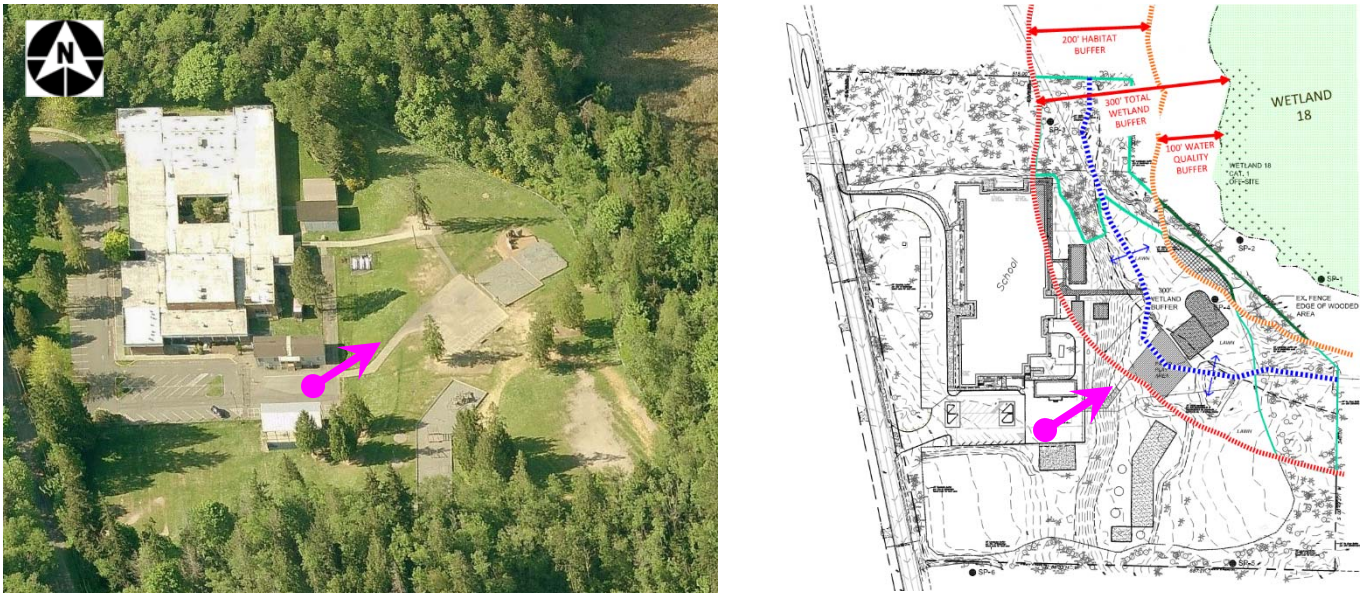
Cowardin Class: PSS1/PEM1 PAB Ecology Category: I/II Local Rating: " " Wetland size: _____ Date: 4/17/17

Function/Value	Occurrence Y	Occurrence N	Rationale	Principal Function(s)	Comments
Flood Flow Alteration	✓		see characterization ?'s		
Sediment Removal	✓		" "		
Nutrient & Toxicant Removal	✓		" "		
Erosion Control & Shoreline Stabilization		✓	" "		
Production of Organic Matter and its Export	✓		" "		
General Habitat Suitability	✓		" "		
Habitat for Aquatic Invertebrates	✓		" "		
Habitat for Amphibians	✓		" "		
Habitat for Wetland-Associated Mammals	✓		" "		
Habitat for Wetland-Associated Birds	✓		" "		
General Fish Habitat		✓	" "		
Native Plant Richness	✓		" "		
Educational or Scientific Value	✓		" "		
Uniqueness and Heritage	✓		" "		

APPENDIX D

Existing Conditions Photographs

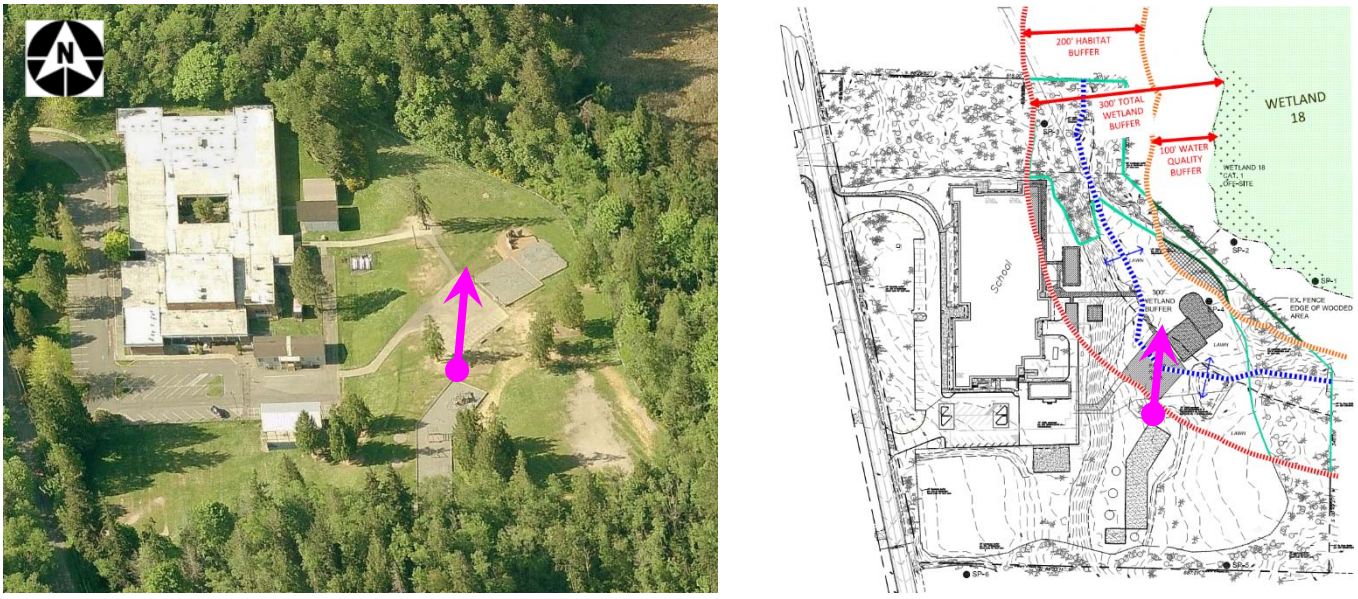
PHOTO 1: Outer edge of prescriptive buffer draining away from wetland unit and toward existing school



Bird's Eye Aerial Image and Existing Conditions Photo Location and Direction Reference

(Aerial Image Source: Bing Maps © 2017 Microsoft - https://www.bing.com/maps ; Refer to Figure 1 for Existing Conditions)

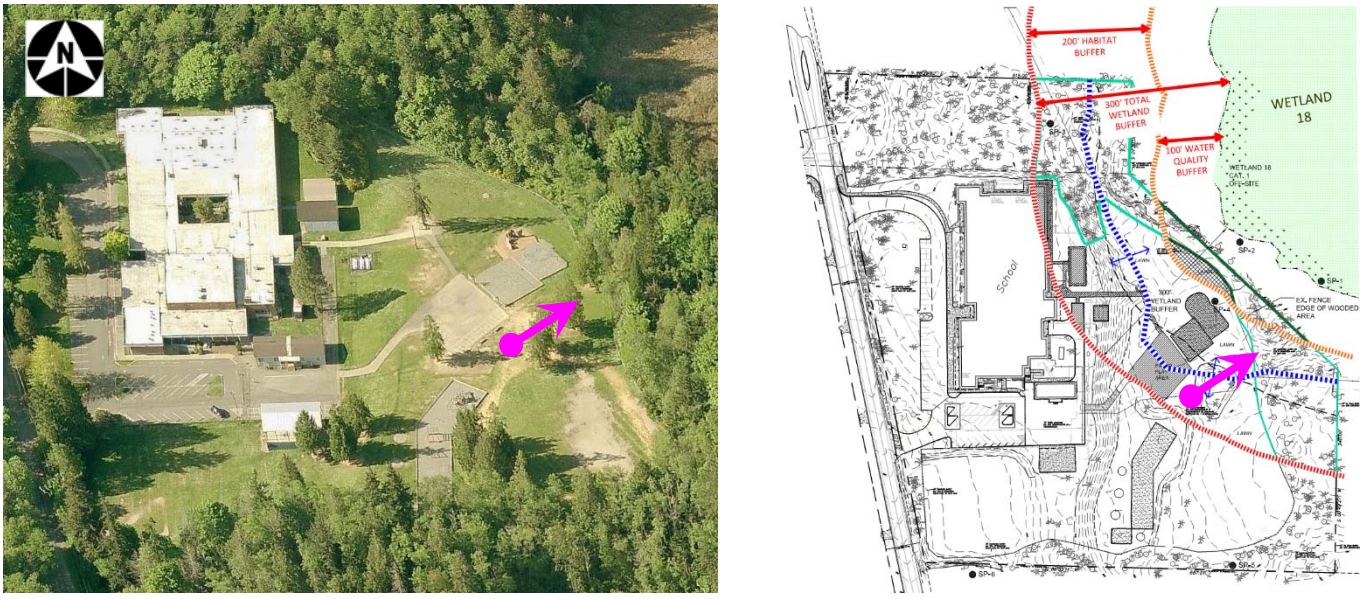
PHOTO 2: Existing paved play areas within prescriptive 300-foot wetland buffer and within the wetland drainage basin



Bird's Eye Aerial Image and Existing Conditions Photo Location and Direction Reference

(Aerial Image Source: Bing Maps © 2017 Microsoft - https://www.bing.com/maps ; Refer to Figure 1 for Existing Conditions)

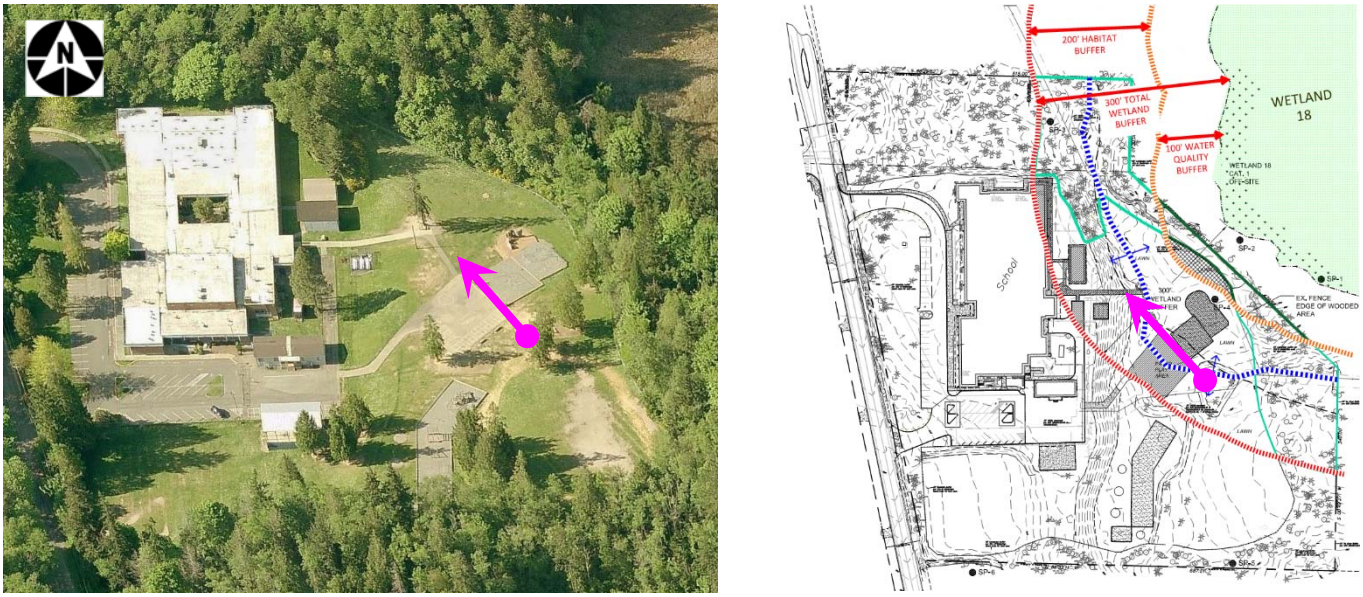
PHOTO 3: Existing buffer conditions within the wetland drainage basin



Bird's Eye Aerial Image and Existing Conditions Photo Location and Direction Reference

(Aerial Image Source: Bing Maps © 2017 Microsoft - https://www.bing.com/maps ; Refer to Figure 1 for Existing Conditions)

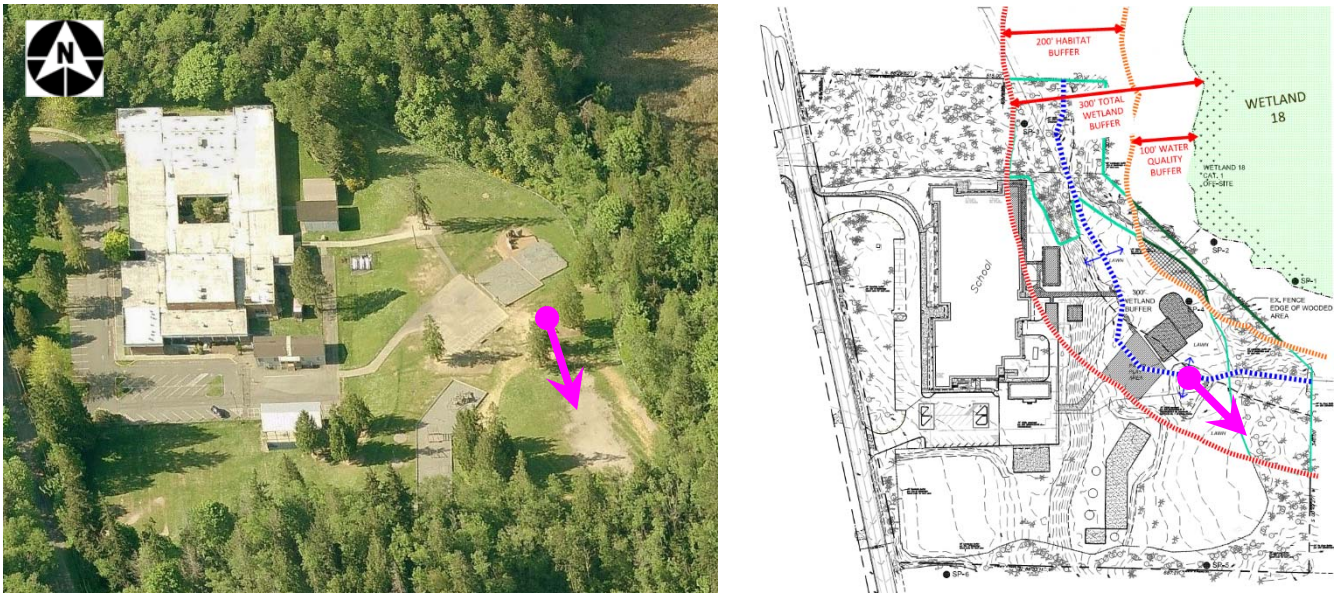
PHOTO 4: Existing buffer conditions within the wetland drainage basin



Bird's Eye Aerial Image and Existing Conditions Photo Location and Direction Reference

(Aerial Image Source: Bing Maps © 2017 Microsoft - https://www.bing.com/maps ; Refer to Figure 1 for Existing Conditions)

PHOTO 5: Existing buffer conditions within the 300-foot prescriptive buffer



Bird's Eye Aerial Image and Existing Conditions Photo Location and Direction Reference

(Aerial Image Source: Bing Maps © 2017 Microsoft - https://www.bing.com/maps ; Refer to Figure 1 for Existing Conditions)

APPENDIX E

Mithun Inc’s Planting Schedule

PLANTED AREA	SPACING	SCIENTIFIC NAME	COMMON NAME	SIZE	AREA	QTY
NATIVE NORTHWEST FOREST CANOPY	**12' OC**				**2500**	**20**
		PSEUDOSTUGA MENZIESII	DOUGLAS FIR	2 GALLON	1,000 (40%)	8
		TSUGA HETEROPHYLLA	WESTERN HEMLOCK	2 GALLON	625 (25%)	5
		THUJA PLICATA	WESTERN RED CEDAR	2 GALLON	625 (25%)	5
		CORNUS NUTTALLII	PACIFIC DOGWOOD	2 GALLON	250 (10%)	2
NATIVE NORTHWEST FOREST SHRUBS	**5' O.C.**				**3500 SF (100% OF AREA)**	**140**
		ACER CIRCINATUM	VINE MAPLE	1 GALLON	175 (5%)	7
		AMELANCHIER ALNIFOLIA	SERVICEBERRY	1 GALLON	175 (5%)	7
		RIBES SANGUINEUM	RED FLOWERING CURRANT	1 GALLON	175 (5%)	7
		HOLODISCUS DISCOLOR	OCEANSPRAY	1 GALLON	175 (5%)	7
		GAULTHERIA SHALLON	SALAL	1 GALLON	700 (20%)	28
		SYMPHORICARPOS ALBUS	SNOWBERRY	1 GALLON	700 (20%)	28
		MAHONIA NERVOSA	LOW OREGON GRAPE	1 GALLON	700 (20%)	28
		POLYSTICHUM MUNITUM	WESTERN SWORD FERN	1 GALLON	700 (20%)	28
NATIVE NORTHWEST FOREST CANOPY - MEADOW	**12' OC**				**2000**	**16**
		PSEUDOSTUGA MENZIESII	DOUGLAS FIR	2 GALLON	1,200 (60%)	10
		THUJA PLICATA	WESTERN RED CEDAR	2 GALLON	800 (40%)	6
NATIVE GRASS/HERBACEOUS MEADOW SEED MIX					**8000**	**8 LBS**
	1.00 PLS LBS PER 1000 SF		NATIVE SHORT GRASS MIX	SEED	6,000 (75%)	6 LBS
	0.5 PLS LBS PER 1000 SF		NATIVE HERBACEOUS MIX	SEED	2,000 (25%)	1 LB

Mithun, Inc. Planting Schedules (provided to Raedeke Associates Inc. July 12, 2017)

SUNMARK SEEDS INTERNATIONAL, INC.
PO Box 1210
Fairview OR 97024
503-241-7333
888-214-7333

NO MOW FESCUE MIX

Native EcoTurf

Sunmark Prairie Mix

Acres: 1
Quantity: 43.67 lbs.

Botanical Name	Common Name	% by Weight	Seeds per lb. of Mix	Seeds per lb.	Actual % by Seed Size	Lbs. Needed	% Requested
Festuca rubra rubra	Native Red Fescue	45.00%	225000	500,000	36.67%	19.65	35%
Bouteloua gracilis	Blue Grama	25.00%	206250	825,000	33.62%	10.92	35%
Buchole dactyloides	Buffalograss	20.00%	11200	56,000	1.83%	8.73	3%
Koeleria macrantha	Prairie Junegrass	7.00%	162050	2,315,000	26.41%	3.06	25%
Trifolium fragiferum	Strawberry Clover	3.00%	9000	300,000	1.47%	1.31	2%
	TOTALS:	**100.00%**	**613500**		**100%**	**43.67**	**100%**

Seeding Rate
1.00 PLS lbs. per 1000 sq. ft.
43.67 PLS lbs. per acre

Eco Turf is a native EcoLawn mix that has been designed for low/no maintenance sites. Similar to other “EcoLawns” but this one is NATIVE!!