Final Interim Action Work Plan
Bay Wood Products Cleanup Site
Everett, Washington

July 29, 2020

Prepared for

Port of Everett
Everett, Washington

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LIST OF ABBREVIATIONS AND ACRONYMS

AO ..... agreed order
BA ..... biological assessment
bgs ..... below ground surface
BMP ..... Best Management Practice
City ..... City of Everett
cPAH ..... carcinogenic polycyclic aromatic hydrocarbons
CMP ..... compliance monitoring plan
CY ..... cubic yards
DCM .... Bay Wood Redevelopment & Shoreline Cleanup & Restoration Design Criteria Memo
Dev ..... revitalization of uplands portion of the Site
DNR ..... Washington State Department of Natural Resources
Ecology ..... Washington State Department of Ecology
EDR ..... engineering design report
EFH ..... Essential Fish Habitat
ESA ..... Endangered Species Act
FS ..... feasibility study
ft ..... feet
GIS ..... geographic information system
HPA ..... Hydraulic Project Approval
IAWP ..... interim action work plan
ID ..... identification
JARPA ..... Joint Aquatic Resources Permit Application
Low Area ..... topographic low area - southeast portion of the Site
LWD ..... large woody debris
M-2 ..... Heavy Manufacturing
MDNS ..... Mitigated Determination of Non-Significance
MFR ..... Memorandum For the Record
MLLW ..... mean lower low water
MMP ..... Maintenance and Monitoring Plan
M-S ..... Marine Services
MSL ..... mean sea level
MTCA ..... Model Toxics Control Act
ng/kg ..... nanograms per kilogram
OHWM ..... Ordinary High Water Mark
PCB ..... polychlorinated biphenyl
PCL ..... preliminary cleanup levels
Port ..... Port of Everett

LIST OF ABBREVIATIONS AND ACRONYMS (con't)

Property ..... Port of Everett
RCW ..... Revised Code of Washington
REL ..... remediation level
RI ..... remedial investigation
SAP ..... Sampling and Analysis Plan
SEPA ..... State Environmental Protection Act
SHPO ..... State Historic Preservation Officer
Site ..... Bay Wood Products cleanup site
SL ..... screening level
TEQ ..... toxicity equivalency quotient
TESC ..... temporary erosion and sediment controls
TPH-D ..... total petroleum hydrocarbons diesel range
TPH-O ..... total petroleum hydrocarbons oil range
USACE ..... United States Army Corp of Engineers
WAC ..... Washington Administrative Code
WDFW ..... Washington Department of Fish and Wildlife

1.0 INTRODUCTION AND BACKGROUND

The Port of Everett (Port) is currently working in partnership with the Washington State Department of Ecology (Ecology) to execute an Interim Cleanup Action at the Bay Wood Cleanup site (Site) in Everett, Washington (Figure 1). The interim action, as described in this Interim Action Work Plan (IAWP), is being conducted as part of Ecology's Puget Sound Initiative environmental cleanup program, and in conjunction with and to support revitalization and economic development of the Site. In general, the interim action will achieve environmental cleanup, habitat restoration, and buffer enhancements along a majority of the perimeter of the property. This IAWP describes those activities and those which are required under the Agreed Order (AO) between the Port and Ecology (No. DE-5490, Amended February 4, 2020).

Prior documents were developed in support of this interim action, including the Bay Wood Redevelopment and Shoreline Cleanup and Restoration Design Criteria Memorandum (DCM, January 20, 2019; provided in Appendix C). The DCM was used to gain Port, City of Everett (City), and Ecology agreement on the basic scope and purpose of the shoreline interim action. Additional refinement of the scope of the work has occurred and will continue through more detailed engineering design and other documents and studies (described below); however, the intent and basic points of agreement described in the DCM will be maintained through execution of the project. Additionally, since the time of the DCM, the scope of the interim action has expanded to include the environmental remediation of a topographic Low Area on the southeast portion of the Site – an area that was impacted by unauthorized contaminated water discharge from the property to the south. The topographic Low Area is referred to as the "Low Area" throughout this IAWP. As a result, this IAWP includes the scope of work described in the DCM and the scope of work required for the environmental remediation of the Low Area.

Former uses of this Site included sawmilling operations and log storage activities that started in the 1930s and ceased in the mid-1990s. While the portion of the property landward of the shoreline was cleaned up and backfilled with Snohomish River dredge sands by the Port in the 1990s, the shoreline remains challenged by a low-functioning, publicly inaccessible shoreline that has scattered industrial debris, over-steepened shoreline embankment made of quarry spalls and wood debris, dilapidated creosote-treated bulkheads, other unnatural features, and is overgrown with invasive plant species. These environmental challenges will be resolved by this interim action, in addition to the soil remediation in the topographic Low Area.

The Site is currently listed on the Ecology Cleanup List (Facility Site Identification [ID] 4438641, Cleanup Site ID 2581). The Port is conducting the interim action in accordance with the Model Toxics Cleanup Act (MTCA) requirements, as part of the above-referenced AO. The underlying AO requires the Port to conduct a remedial investigation (RI) to identify the nature and extent of contamination, and a feasibility study (FS) to develop and evaluate a range of remedial strategies. While the RI/FS activities are ongoing, it has become necessary to complete an interim action before those activities

are finalized. As such, the February 2020 amendment to the AO requires the Port to conduct an interim cleanup and restoration action at the Site. Two related deliverables included in the amended AO, associated with the interim cleanup action, are this IAWP and an Engineering Design Report (EDR). These two documents together satisfy the requirements of Washington Administrative Code (WAC) 173-340-430(7), which governs the submittal requirements for MTCA Interim Cleanup Actions.

The interim cleanup and restoration action will address near-shore cleanup activities that must be addressed as part of the Site revitalization efforts. The interim action will be implemented in advance of selection of the final cleanup action for the Site and, as such, must not prevent the implementation of other reasonable alternatives for the final cleanup action (WAC 173-340-430(3)(b)). This requirement was taken into account when developing the interim actions presented in this IAWP.

1.1 Site Description

The Site is located at 200 West Marine View Drive, near the confluence of the Snohomish River and Port Gardner Bay (Figure 1) and consists of approximately 41.3 acres of upland and aquatic land owned primarily by the Port.

The Snohomish County parcel numbers associated with the Site, and owned by the Port, include 29050700101000, 29050700100300, and 29050700100500. The Site is bordered on the north by a vacant lot owned by Kimberly-Clark Worldwide, Inc. (Kimberly-Clark; parcel number 29050700100100) and bordered on the south by the W&W Everett Investments LLC property (parcel number 29050700100400). The W&W Everett Investments LLC property is part of the "Jeld-Wen" MTCA Site, and is currently undergoing cleanup under an agreed order with Ecology.

The upland portion of the Site extends into Port Gardner Bay with a maximum elevation of approximately 15 feet (ft) above mean sea level (MSL). Although a portion of the Site may extend into Gardener Bay, into land owned by the State of Washington and managed by the Washington State Department of Natural Resources (DNR), all of the work proposed herein will occur upland of the inner harbor line on land owned by the Port. The southern portion of the Site lies within the 100-year floodplain of the Snohomish River, according to mapping completed in 2016. The in-water portion of the Site consists primarily of tideland mudflats ranging in elevation from approximately 0 to 6 ft mean lower low water (MLLW).

The U.S. Army Corps of Engineers (USACE) manages an easement measuring approximately 100 ft wide that is used to access a training wall that diverts the main flow of the Snohomish River north of Jetty Island. This easement encompasses approximately 4.1 acres of the Site, as shown on Figure 2 and is located along the northern shoreline of the Site.

At the southern end of the Site, there is a topographic Low Area that consists of a narrow surface depression approximately 15 ft wide elongated from east to west between the W&W Everett Investments LLC property and the Bay Wood Site. The depression widens to approximately 30 to 40 ft

wide and extends north along West Marine View Drive (Figure 4). The east/west-oriented portion of the Low Area is topographically bounded to the south by an approximately 2-ft high retaining wall located on the W&W Everett Investments LLC property, and to the north by approximately 6 ft of fill in the upland portion of the Site; the north/south-oriented portion of the Low Area is laterally bounded to the west by the fill on the upland portion of the Site, and to the east by West Marine View Drive. Photos of the Low Area taken during 2019-2020 test pit activities (described below in Section 2.2) are included in Appendix A; additional details, including cross sections of the Low Area, will be presented in the EDR. In 2017, it was observed that water was being pumped from a sump located in the W&W Everett Investments LLC property truck bay (North Truck Dock Sump Drain) into the Low Area (Port property; see Figure 3) without authorization from the Port. The discharge appeared to be derived from several sources including roof-water runoff, roadway stormwater drainage, and groundwater. Under the direction of Ecology, surface soil samples were collected by Jeld-Wen Inc. from the Low Area in 2018 at both the discharge point and at the end of a conveyance pipe. Laboratory analysis of these samples indicated the presence of carcinogenic polycyclic aromatic hydrocarbons (cPAHs), dioxins/furans, and residuals range total petroleum hydrocarbons (TPH-O) at concentrations above preliminary cleanup levels (PCLs) for the Site (SLR 2018). This condition is discussed further in Section 2.

1.2 Previous Documents and Studies

In developing the Shoreline Cleanup and Restoration portion of the interim action, several studies and documents have been prepared by the Port with Ecology's review:

- *Draft Biological Evaluation, Bay Wood Shoreline Interim Cleanup and Restoration.* Everett, Washington. Prepared for the Port of Everett by Shannon & Wilson, Inc. This report was prepared to address the requirements of Section 7 of the Endangered Species Act (ESA). September 2019.
- *Habitat Assessment, Bay Wood Shoreline Interim Cleanup and Restoration.* Everett, Washington. Prepared for the Port of Everett by Shannon & Wilson, Inc. September 2019.
- *Tidal Hydraulics Study and 30% Design Report, Bay Wood Shoreline Interim Cleanup and Restoration.* Everett, Washington. Prepared for the Port of Everett by Shannon & Wilson, Inc. July 2019.
- *Memorandum: Restoration Design Criteria, Bay Wood Redevelopment and Shoreline Interim Cleanup and Restoration.* Everett, Washington. Prepared for the Port of Everett by Shannon & Wilson, Inc. June 2019.
- *Bay Wood Test Pit Findings and Materials Management Plan.* Everett, Washington. Prepared for the Port of Everett by Shannon & Wilson, Inc. July 2019.

In developing the Low Area remediation portion of the interim action, additional studies and reports have been prepared by the Port or others with Ecology's review:

- *North Truck Dock Stormwater Sump Investigation.* Prepared for Jeld Wen Inc. by SLR. August 2018.

- LAI conducted test pit excavation and soil sampling at locations in the Low Area along the former W&W Everett Investments LLC property discharge pipe line and West Marine View Drive. Results are discussed below in Section 2.2.2. Additional laboratory analyses for samples collected from these test pits are in progress at the time of this IAWP; these additional results will be presented in the forthcoming EDR.

These documents collectively support the IAWP and are included by reference. In the event there are inconsistencies between documents, the Port and Ecology shall use best professional judgement on a case-by-case basis as to the hierarchy of the documents to determine the appropriate action.

1.3 Historical Site Ownership and Uses

The Site appears to have been owned by the Port for decades, but it has changed tenants on multiple occasions since 1936. Use of the Site was fairly consistent throughout the changes in tenancy and typically supported the lumber and timber industry.

The following bulleted list summarizes the time period, Site tenants, and general Site uses from approximately 1936 to present:

- **1936 to 1946**: Parker Lumber and Mill Company; saw milling.
- **1946 to 1968**: Washington Wood Products[1]; saw milling in the eastern portion of the Site.
- **1970 to 1976**: Publishers Forest Products Company; saw milling; added buildings (GeoEngineers 2018)[2].
- **1976 to 1978**: West Coast Orient Lumber Mills; saw milling.
- **1978 to 1979**: West Coast Lumber Operations Company; saw milling.
- **1979 to 1994**: Bay Wood Products[3]; log processing.
- **1995 to 2020**: Port; Site vacant and unused, various upland cleanups conducted under MTCA.

Typical milling operations conducted at the Site included sawing, re-sawing, planing, kiln-drying, sorting, fabrication, storage, and transfer operations. The milling operations were primarily located on the eastern approximately 1/3 of the Site. The western approximately 2/3 of the Site was used primarily for lumber and log storage. A log way was located on the southern portion of the Site and large log rafts were located to the northwest and north of the Site. Areas on the eastern, northern, and southern portions of the Site were filled in various stages beginning in the late 1800s or early 1900s when the adjacent railroad was being constructed along Port Gardner Bay. Figure 3 shows the approximate locations of historical activities and buildings.

[1] Later known as Washington Timber Products.
[2] New buildings shown in aerial photographs (GeoEngineers Draft RI/FS Addendum Figures 1 through 6).
[3] By 1991, Bay Wood Products had dismantled the sawmill operation and removed a majority of the buildings from the Site, including the boiler building, several dry kilns, and lumber sheds.

In 1979, Bay Wood Products, Inc. began dismantling the sawmill, demolishing buildings, and using the Site primarily for log storage and processing. By 1985, the main operations building had been removed from the Site, with remaining buildings removed by 1994.

Currently, there are no operations utilizing upland or marine portions of the Site other than the USACE maintenance of the training wall on the dike. A detailed summary of historical development and operations is presented in the Draft RI/FS Report (GeoEngineers 2018).

1.4 Current Zoning

The current zoning for the upland portion of the Site is a combination of Heavy Manufacturing (M-2) and Marine Services (M-S) with the adjacent tidelands zoned as Aquatic per the City Planning and Community Development geographic information system (GIS) map dated January 6, 2017. The City Shoreline Master Program published in July 2016 (City of Everett 2016) designates the upland shorelines of the Site as Urban Industrial. The tidelands area southwest of the Site, between Bay Wood and the W&W Everett Investments LLC property, is designated as Aquatic Conservancy. The tidelands area north of the Site is designated as Aquatic. The purposes of these designations are similar and are to protect the unique characteristics and resources of the aquatic environment by managing use activities to prioritize preservation and restoration of natural resources, navigation, recreation, and commerce, by assuring compatibility between upland and aquatic uses.

1.5 Future Site Use

The interim action is being completed in conjunction with a revitalization of the uplands portion of the Site (Development). The Development currently proposed for the Site includes a distribution, manufacturing, and office facility with associated infrastructure. Approximately 12.8 acres of the 38.63-acre Site is developable, or landward of the Ordinary High Water Mark (OHWM) and associated buffer.

The development currently proposed on the Site will consist of a single building with a footprint of approximately 265,000 SF. The building will be primarily used for distribution and manufacturing, and less than a quarter of the space in the building will be for office use. Surface parking will surround the building on all sides. The Development will be responsible for establishing a public gravel (or other material type) trail that will be built within the shoreline buffer to enhance public access and recreation in accordance with the City of Everett's Shoreline Public Access Plan. Clean fill material will be imported to support the Development with the intent to raise the site elevation by 3 to 5 ft, and this fill will be sloped down to meet the landward boundary of the riparian buffer being installed as a part of the shoreline restoration. The final slope angles and transitions from the sloped fill to the sloped shoreline are currently being developed, and will be presented in detail in the EDR.

1.6 Surrounding Areas

The Site is bounded to the north by vacant land owned by the Kimberly-Clark Worldwide, Inc. To the south, the Site is bounded by the W&W Everett Investments LLC property, which is part of the Jeld-Wen MTCA Cleanup Site. To the east, the Site is bounded by West Marine View Drive and land owned by the Port, beyond which is the BNSF railway and vacant marshland (Maulsby Marsh). Port Gardner bounds the western portion of the Site. A City of Everett outfall is located on the northeastern shoreline of the Site adjacent to the Kimberly-Clark-owned parcel (as shown on Figure 2).

The Site extends into Port Gardner Bay. Surface water adjacent to the Site, including the Snohomish River and Port Gardner Bay, are used for both commercial and recreational vessel navigation and commercial and subsistence fishing.

1.7 Geology and Hydrogeology

The City of Everett lies within the Puget Sound lowland, a geomorphic depression formed between the Olympic Mountains and the Cascade Range characterized by relatively thick accumulations of glacial and interglacial deposits overlying Tertiary sedimentary and igneous rocks. The glacial deposits generally consist of a complex sequence of lacustrine sediments, advance outwash, drift, till, and recessional deposits. Interglacial deposits are characterized by river processes and include alluvial and estuarine stratified sediments comprised largely of sand, silt, and clay with considerable amounts of organic matter exceeding 90 ft in thickness in areas.

The upland area at the Site was primarily created by infilling a portion of the historical mudflat with dredged material generated from the Snohomish River and possibly other sources. Previous investigations completed at the Site identified approximately 7 to 9 ft of sands and silts over historical marine deposits (Anchor QEA and SLR 2011). In addition, a shallow, unconfined groundwater-bearing zone was identified at depths ranging from 2.5 to 6 ft below ground surface (bgs). Based on the available information, the inferred groundwater flow is generally toward Port Gardner Bay to the west.

In the mid-1990s the Port removed approximately 140,000 CY of bark, rock, and wood chips from the northwest portion of the upland area. Following removal of these materials, a dike was constructed of imported rock, sand, and gravel fill engineered to construct a stable shoreline bank around the western portion of the Site as shown on Figure 3. The dike was constructed of imported rock fill material of acceptable quality and economics for future site uses. The native soil underlying the fill consists of gray, fine to medium, alluvial sand deposits containing varying amounts of silt, coarse sand and gravel, with some wood or other organic fragments(Forest Industries Engineering Systems 1995). The area immediately upland of the dike was subsequently filled with 200,000 CY of dredged sand from the Snohomish River Federal Navigation Channel.

2.0 PREVIOUS INVESTIGATIONS AND CLEANUP ACTIVITIES

Several environmental investigations and associated cleanup actions have been completed at the Site to evaluate concerns noted in the 1989 Phase I Environmental Site Assessment. Detailed information regarding the historical previous environmental studies and cleanup activities completed are presented in the Draft RI/FS (GeoEngineers 2018).

The following bullets, along with Figure 4, summarize the time period and provide general comments related to the activities:

- **1992 and 1993**: A limited soil investigation and accompanying soil cleanup was conducted to address a small area of PCB-contaminated soil related to historical electrical transformer releases.
- **1994 and 1995**: Additional soil investigations evaluated wood debris in the upland portion of the Site. This exploration subsequently resulted in the removal of approximately 140,000 CY of bark, rock, and wood chips from the northwestern portion of the Site (LAI 1994, 1995).
- **1995**: The Port constructed a dike around the western 2/3 of the Site approximately 50 ft from the shoreline, and filled the encompassed area with approximately 200,000 CY of material dredged during maintenance of the Snohomish River Federal Navigation Channel (LAI 1995).
- **2005**: The Port stockpiled dredged material from the 14th Street Bulkhead Replacement project to facilitate the evaluation for suitability of open-water disposal. Further evaluation showed the stockpiled material exceeded MTCA Method A Cleanup Levels for cPAHs (RETEC Group 2005).
- **2009**: An area-wide sediment investigation in Port Gardner Bay was conducted and the results are presented in the Draft RI/FS report (Anchor QEA and SLR 2011).
- **2009**: The Port completed two phases of investigation in the marine area to evaluate for potential impacts to sediment from historical operations (Anchor QEA and SLR 2009).
- **2009**: The Port conducted an additional soil investigation to evaluate for potential impacts to soil and groundwater from historical operations (Anchor QEA and SLR 2009, 2011).
- **2011**: The Port and Ecology published the Draft RI/FS Report for public review and comment (Anchor QEA and SLR 2011; SLR 2009).
- **2012**: The Port conducted an additional investigation of sediment to evaluate the extent of dioxin/furan contamination.
- **2012**: The Port conducted an Interim Action to excavate and dispose of soil stockpiles contaminated with cPAHs that were placed onsite in 2005. The Port removed approximately 8,000 CY of soil (GeoEngineers 2018).
- **2014**: The Port conducted a sediment geochronology study to evaluate sediment stability and net sedimentation rates of the nearshore areas (GeoEngineers 2014).
- **2018:** In 2018, Jeld-Wen Inc. conducted soil sampling in the Low Area of the Site to characterize soil impacts due to the unauthorized discharge from the W&W Everett Investments LLC property. The results of this sampling indicated soil with TPH-diesel range (TPH-D), cPAH, and dioxin/furan concentrations above Site screening levels (SLs) (SLR 2018).

More recently, the Port collected samples in 2019 and 2020 (S&W 2019) from test-pit explorations advanced along the shoreline and in the Low Area, to characterize environmental conditions in support of the interim cleanup action.

2.1 2019–2020 Shoreline Explorations

To support the shoreline restoration design, test pit excavation was conducted in April 2019 and March 2020.

2.1.1 April 2019 Test Pit Sampling

In April 2019, ten test pits were advanced at the shoreline locations shown on Figure 5 to inform the shoreline restoration design. The results of the findings are presented in the Test Pit Findings and Soil Management Plan (S&W 2019).

2.1.2 March 2020 Test Pit Sampling

Additional exploration at the same April 2019 test pit locations was conducted in March 2020 to provide supplemental design information to refine excavation plans and management plans of excavated soil for the shoreline restoration. An archeological and cultural resources consultation was conducted prior to this work in accordance with Executive Order 05-05. In addition to logging field screening observations of excavated soil, environmental samples were collected from select test pit locations along the extent of the project area. The samples were analyzed for all contaminants of concern identified for the Site during the RI, including TPH-D, cPAHs, metals, PCBs, and dioxins/furans. Based on field screening of the soils during exploration and the laboratory analyses, concentrations of the chemicals of concern were detected above Site cleanup levels in the soils planned for excavation along the shoreline only in and near the Low Area. As anticipated prior to the investigation, and confirmed with these results, the berm construction materials, dredge fill materials, and underlying soil with wood debris are not contaminated. These analytical results will be presented in the EDR to support decisions on the final disposition of excavated soils. Also, as soil samples collected during this effort may coincide with the final depth of excavation following implementation of the interim action, analytical data may be useful in evaluating compliance with cleanup standards; these samples are discussed further in the Compliance Monitoring Plan (Appendix B). Based on the evaluation including all Site contaminants of concern identified in the RI, it is anticipated that the soil excavated from this area can be reused on Site, if determined to be geotechnically competent fill material to achieve desired grades during upland development. Specific plans for final disposition of excavated soil, whether it is reused on Site or disposed of off-site, will be presented in the EDR. The soil sample collected at TP-9 contained dioxins/furans toxicity equivalency quotient (TEQ) above the cleanup level. This finding was also expected, based on the close proximity to a sediment sample collected during the RI with a similar concentration and, as a result, soil excavated from this location will be disposed offsite and will not be reused at the Site with other “clean” soils. These data, which are

currently being processed and fully evaluated, will be fully presented in the EDR with corresponding plans for handling and onsite management of these soils.

2.2 2019-2020 Low Area Soil Characterizations

In the Low Area, eight test pits were advanced in the locations shown on Figure 5, in the area just west of West Marine View Drive. In support of this interim cleanup action, these test pits were advanced to characterize the nature and extent of contamination related to the unauthorized discharge from the adjacent W&W Everett Investments LLC property. Soil characterization activities are presented in a Sampling and Analysis Plan (SAP; LAI 2019), which was reviewed and approved by Ecology. As previously noted in Section 1.4, historical water discharges from the W&W Everett Investments LLC property to the Low Area resulted in TPH-D, cPAH, and dioxin/furan releases to the ground surface.

2.2.1 "Phase I" Low Area Soil Characterization Sampling

In accordance with the SAP, the initial "Phase I" characterization was conducted by advancing test pit explorations east and west of the 2018 sampling location NTD-SED-B (TP-2, TP-3); east and west of the 2018 sampling location NTD-SED-A (TP-4, TP-5); and at one additional location to the east TP-6. Due to cultural resources concerns, only surface (0 to 0.5 ft) samples were collected during this sampling effort. An archeologist was onsite during sampling to observe for potential cultural resources; no archeological materials were observed.

Following the procedures in the SAP, these Phase I samples were initially analyzed for TPH-D and TPH-O and cPAHs. As shown in Table 1, TPH-D, TPH-O, and cPAH analytical concentrations in all five samples were below the RI/FS soil SLs for the Site.

As presented in the SAP, dioxin/furan analysis was conducted as a follow-up analysis due to the extended turnaround time and high cost of this analysis. After reviewing the initial TPH-D and cPAH results, follow-up dioxin/furan analyses were conducted at the locations where concentrations were below SLs (all sampling locations; TP-2, TP-3, TP-4, and TP-5).

2.2.2 "Phase II" Low Area Soil Characterization

Following the initial "Phase I" characterization activities, "Phase II" was initiated in accordance with the SAP, which included advancing test pit explorations TP-1 through TP-8. The test pits were excavated to approximately 3 ft bgs at each location, except at TP-7, where an asphalt surface was encountered at 0.5 ft bgs, and at TP-8, where an asphalt surface was encountered at 2 ft bgs. Samples were collected in accordance with the SAP from 0 to 1 ft bgs (if not already collected during Phase I), 1 to 2 ft bgs, and 2 to 3 ft bgs, with the exception of deeper samples at TP-7 and TP-8, due to the asphalt surface. Because only dioxins/furans in Phase I exceeded the SLs, Phase II samples were analyzed only for dioxins/furans.

2.2.3 Low Area Soil Characterization Results

The analytical results for soil samples collected during this evaluation are presented in Table 1. In addition to the TPH-D and cPAH SLs discussed above, the method B human health direct contact cleanup level of 13 nanograms per kilogram (ng/kg) was used for comparison of dioxins/furans results.

As shown in Table 1, the concentrations of TPH-D and cPAH at each test pit location are less than the SLs. Dioxin/furans were detected at varying concentrations in the soil samples as follows:

- At the two locations directly west of the 2018 sampling location NTD-SED-B (TP-1 and TP-2), dioxins/furans TEQ values are greater than the SL in surface samples (138 and 58.6 ng/kg, respectively), and just below the SL in the 1- to 2-ft interval at TP-2 (12.3 ng/kg). The results for both TP-1 and TP-2 in the 2- to 3-ft interval are well below SL TEQ (4.29 and 0.706 ng/kg, respectively). These results indicate a significant decrease in dioxins/furans concentrations with depth.
- At the location directly east of 2018 sampling location NTD-SED-B (TP-3), the dioxins/furans TEQ value is below the SL (TEQ value is 0.956 ng/kg as compared to the SL TEQ value of 13 ng/kg).
- At the location directly west of the 2018 sampling location NTD-SED-A (TP-4), dioxins/furans TEQ values are greater than the SL in the surface sample (143 ng/kg), and above the SL in the 1- to 2-ft interval (32.6 ng/kg). The 2- to 3-ft interval is below the SL TEQ at 5.48 ng/kg. These results also indicate a significant decrease in dioxins/furans concentrations at depth.
- At the location directly east of 2018 sampling location NTD-SED-A (TP-5), the dioxins/furans TEQ value is below the SL (TEQ value is 5.50 ng/kg).
- At the locations in the Low Area along West Marine View Drive (TP-6, TP-7, and TP-8), dioxins/furans TEQ values in the shallow interval are above the SL (351, 84.2, and 27 ng/kg, respectively), but with decreasing concentrations from south to north. Dioxins/furans concentrations in the 1- to 2-ft interval at TP-6 (71.4 ng/kg) are significantly lower than concentrations at the surface, but are still above the SL. Analytical data at the deepest sample at TP-6 (2- to 3-ft interval) indicates an anomalous increase in dioxin/furan concentrations at this location(194 ng/kg).

Based on the results summarized above, which will be further considered in the EDR, it appears that the dioxin/furan contamination in the Low Area is generally limited to the upper 1 ft, with only minor detections in samples collected below this depth. The contamination is also relatively widespread laterally across the Low Area. Dioxin/furan contamination below the upper 1 ft is also present, and will also be considered in the evaluation of interim action alternatives below and in the EDR. This data is consistent with the understanding that this contamination is the result of soil and/or debris particulate matter settling out of the unauthorized discharge from the W&W Everett Investments LLC property that “flooded” topographically low areas (comprising the entire Low Area as described in this document), and that contaminant transport was limited to the extent of this “flooding.” Based on this understanding, contamination is unlikely to be present outside of the lateral limits of the Low Area.

3.0 EVALUATION OF INTERIM ACTION ALTERNATIVES

This section presents the development of several interim cleanup and restoration action alternatives, and selection of the interim action proposed for the Site to address contamination and restoration along the Site's shoreline and in the Low Area. The purpose of the interim action is to protect human health and the environment and, more specifically, to provide adequate protection from chemical exposure for environmental receptors in the adjacent marine surface water and sediment, and improvement in habitat quality and biological function.

3.1 Basis for Interim Action

MTCA distinguishes an interim action from a cleanup action in that an interim action only partially addresses the cleanup of a Site and achieves at least one of the following purposes [WAC 173-340-430(1)]:

- Reduces the threat to human health and the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance [WAC 173-340-430(1)(a)].
- Corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed [WAC 173-340-430(1)(b)].
- Completes a site hazard assessment, RI/FS, or designs a cleanup action [WAC 173-340-430(1)(c)].

The proposed interim action will achieve the first and second bullets above. The interim action would reduce the threat to human health and the environment through shoreline restoration and Low Area excavation, preventing contamination from migrating into groundwater, Site soils, and/or into the Snohomish River or Port Gardner Bay, and corrects a problem that would become substantially more difficult to address if delayed.

An interim cleanup action must also meet one of the following general requirements [WAC 173-340-430(2)]:

- Achieve cleanup standards for a portion of the site.
- Provide a partial cleanup (clean up hazardous substances from all or part of the site, but not achieve cleanup standards).
- Provide a partial cleanup and not achieve cleanup standards, but provide information on how to achieve cleanup standards.

The proposed interim action will meet the requirements of the second bullet above (provide a partial cleanup) by:

- Removal of soils and associated debris delineated through investigations along the shoreline and contaminated soils in the Low Area that are greater than human health and terrestrial ecological screening levels.

- Improve inter-tidal habitat by removing quarry spalls, wood debris, historical industrial remnants, and creosote-treated bulkheads.
- Improve surface substrates for benthic organisms.
- Improve shoreline slope stability through grading the shoreline and top-dressing the slope with materials designed to provide greater shoreline resilience to predicted wave action and reduce coastal erosion, and facilitate the establishment of wetland vegetation, and support aquatic organisms.
- Native material will be placed on the upland slopes after grading to encourage native vegetation growth.

The proposed interim action is necessary to effectively remove and/or contain deleterious materials in the shoreline area and chemical contamination in the Low Area, to prevent further exposure risks, and allow time for the proper implementation of the complete RI/FS process. The proposed interim action meets the requirements of MTCA described above by reducing the threat to human health and the environment through eliminating or substantially reducing one or more pathways for exposure to a hazardous substance. The interim action will address contaminated soil that might otherwise be released to marine surface water and sediment, and is designed to provide a permanent cleanup action at the shoreline and the Low Area.

The interim action in the Low Area will be conducted to address TPH-D, TPH-O, cPAH, and dioxin/furan concentrations detected in soil during characterization activities. Specifically, cleanup will be designed to meet a dioxin/furan TEQ remediation level (REL) of 13 ng/kg, which is the soil SL for human health by direct contact. Cleanup to this REL will address soil with TPH-D, TPH-O, and cPAH concentrations above SLs for protection of both human and terrestrial ecological receptors, and also soil with dioxin/furan concentrations above the human health SL for direct-contact exposure pathways. Overall compliance with this REL and cleanup standards, which is further detailed in the CMP, will be evaluated on an area-wide basis. However, as compliance monitoring data in the Low Area may not be received prior to completion of the interim action and in recognition that cleanup to this REL may not provide complete protection for ecological receptors, the interim action includes the proactive installation of a geotextile stabilization barrier and soil cover to further protect human and ecological receptors and/or if a conditional point of compliance is necessary. Ultimately, compliance with final cleanup standards throughout the Site will be evaluated during the subsequent RI/FS work. In addition to evaluation of human and ecological receptors by the direct contact exposure pathway, soil to groundwater contaminant transport was also considered when developing the interim action REL. Adjustment of the REL to a value protective of groundwater was not determined to be necessary based on: 1) data collected during previous RI/FS activities that indicate dioxin/furan concentrations in groundwater at the site are not above SLs and, thus, the soil to groundwater pathway for dioxin/furans is not complete, and 2) the lack of dioxin/furan SL exceedances in groundwater is consistent with the understanding that dioxins and furans do not typically partition into a dissolved-phase and, instead, adsorb onto soil and/or organic matter surfaces. However, consistent with the discussion of soil

cleanup standards above, compliance with groundwater final cleanup standards throughout the Site will be evaluated during the subsequent RI/FS work.

3.2 Purpose of Interim Action

The purpose of the Interim Action is to meet the requirements of the amended AO and will involve the cleanup of confirmed hazardous substances and improve habitat conditions, including wetland and riparian areas. The general scope of work involves the implementation of approximately 1,300 linear ft of shoreline restoration and approximately 2,200 linear ft of buffer enhancement measures along the shoreline as described in the DCM (Appendix C), and soil remediation in the Low Area.

As detailed in the DCM, the shoreline cleanup and restoration work will involve removing invasive plant species, industrial debris, creosote-treated wood structures, and wood waste, and sculpting significant portions of the shoreline by excavation and backfilling with habitat-friendly and geotechnically suitable material (as needed). It will also involve planting a variety of native plant species, and installing large woody debris (LWD). Monitoring and maintaining the restoration until it has become established is also included.

In the Low Area, the interim action will consist of remediating dioxins-furans contaminated soil, impacted by unauthorized releases from the neighboring property south of the Site, to eliminate exposure pathways and prevent potential recontamination of the shoreline after restoration activities.

Collectively, these actions will ultimately reduce negative impacts to human health and the environment by eliminating or substantially reducing pathways for exposure to a hazardous substance and improve the habitat for wildlife and native plant species.

3.3 Interim Action Alternatives

MTCA requires that an interim action plan present the alternative interim actions considered for application, and an explanation of why the proposed alternative was selected (WAC 173-340-430(7)(b)(ii)). The following sections describe four alternatives considered, and the basis for selecting the proposed interim action. This section provides only the level of detail required to facilitate selection of the preferred alternative from among the four options. Additional summary details for the preferred alternative is provided later in this report, and further engineering design detail to support construction will be presented in the EDR.

The following alternatives were evaluated for implementation:

- Alternative One – No Action.
- Alternative Two – Shoreline Restoration, Limited Low Area Excavation, and Containment.

- Alternative Three – Shoreline Restoration, Low Area Excavation, and Containment.
- Alternative Four – Containment In-Place.

3.3.1 Alternative One—No Action

The first alternative evaluated was to delay cleanup activities until the RI/FS process is completed, and a final cleanup remedy is developed and approved for the Site. This "no action" alternative would have the near-term benefits of cost savings, and would keep the cleanup process on a typical schedule. However, this delay in active cleanup measures would leave in-place hazardous conditions that could be addressed immediately without negative impacts to the cleanup process. Based on experience at similar shoreline cleanup sites, it is likely that an extended period of time will be required to complete the RI/FS process and select the final cleanup remedy, after which several additional years would likely be needed to complete the cleanup action plan, engineering design report, remedial design, permitting, and contractor selection process before actual cleanup could occur. As a result, the cleanup activities described herein would be delayed for an uncertain period of time, while existing known exposures to human health and the environment would be ongoing.

Further, by taking active interim cleanup actions, the land can be safely returned to use by the community and ownership in a controlled and regulated manner in coordination with Ecology, instead of it remaining vacant and in a condition where unauthorized visitation could result in exposure to contaminants. Additionally, there is presently an ecological risk of exposures for biota at the Site in the Low Area where contamination is present in surface soils. Delaying the shoreline restoration cleanup work until the final cleanup remedy is implemented would cause further stress to the aquatic environment and declining populations of native sensitive species in the Puget Sound region. As a result of the urgency for cleanup activities to occur prior to implementation of the final cleanup remedy, to address ongoing potential routes of exposure to contamination, Alternative One is eliminated from further consideration.

3.3.2 Alternative Two—Shoreline Restoration, Limited Low Area Excavation, and Containment

This alternative would consist of addressing the known degraded conditions along the shoreline through a combination of removing invasive plants and anthropogenic debris including wood waste, and restoring functional habitat by backfilling with imported substrate, regrading the shoreline to create shallower slopes, planting native species, and strategic placement of LWD as detailed in the attached DCM. The alternative is divided into two components, referred to in this document as: 1) the shoreline restoration work, and 2) the Low Area remediation. This alternative will increase wetland and riparian habitat acreage, improve slope stabilization, promote native species growth, improve biological function, and result in the direct reduction of chemical contamination at the Site through removal and offsite disposal.

As detailed in the attached DCM, the shoreline restoration cleanup would be implemented by removing debris and invasive species from along the shoreline, regrading the currently over-steepened slope to a more natural profile, placing LWD to provide shoreline stabilization and habitat improvement, restoring wetlands at the Site, planting native species, and generally enhancing the habitat quality and public access to the shoreline. Additional details of this cleanup, including slope stability along the shoreline or against existing retaining walls, would be presented in the EDR.

In the Low Area, soil having concentrations of dioxins/furans above the REL of 13 ng/kg would be excavated and disposed at a permitted offsite disposal facility. The lateral and vertical extents of contamination would be based on the testing results from the 2020 Low Area soil characterization sampling discussed in Section 2. Based on the laboratory analytical results reported to date, it is anticipated that this alternative would include stripping away the upper 1 ft of soil throughout the Low Area an area of 0.4 acres in size, resulting in the removal of approximately 720 tons of contaminated soil. As will be further detailed in the EDR, the upper 0.5 ft of soil has average concentrations approximately 3.5 times greater than the interval from 1 to 2 ft bgs, and removal of the upper 1 ft of soil will result in compliance with the SLs and the dioxin/furan REL in most areas based on an area-wide evaluation of the compliance monitoring samples. Additional focused excavation may be planned in areas below the upper 1 ft of soil with contaminant concentrations greater than the REL (e.g., at TP-4 and TP-6); this excavation would be planned in coordination with Ecology and detailed in the EDR.

Though this excavation is expected to remove soil with dioxin/furan concentrations above the REL throughout the Low Area, the possibility exists that this alternative would leave some residual dioxins/furans contamination with concentrations greater than the REL at discrete locations. Compliance monitoring soil samples would be collected from the floor and the sidewalls of the excavation to document final conditions. A surface cap would also be installed to prevent direct contact with any remaining contamination and prevent migration of the residual contamination. The surface cap would consist of 2 ft of soil and a steel mesh/geotextile combination layer placed at the floor of the excavation; this cap, which would be detailed in the EDR, and would be designed to provide a substantial physical barrier for terrestrial receptors and provide geotechnical stabilization above the underlying soil. Regardless, this alternative would accomplish the goals of an interim action by substantially reducing the direct-contact exposure pathways for human and terrestrial receptors with significant removal of contamination, installation of a physical barrier, and institutional controls. In addition, the anticipated use of the site is industrial/light manufacturing, which will further limit potential exposures. The RI/FS would evaluate the residual concentration remaining in-place and the effectiveness of the surface cap to determine if additional cleanup actions are required in this area. Containment remedies such as this, if used as the final cleanup action, would require establishing an environmental covenant and deed restriction to prevent future activities in the subsurface without consultation with Ecology and strict environmental controls.

3.3.3 Alternative Three—Shoreline Restoration and Low Area Excavation and Containment

This alternative is similar to Alternative Two by addressing the known degraded conditions along the shoreline through a combination of removing debris and restoring functional habitat through regrading, removal of invasive species, planting native species, and strategic placement of LWD, as described in the DCM (Appendix C). The shoreline restoration work is unchanged from Alternative Two, but the Low Area excavation is extended to a depth of 2.5 ft in a majority of the areas, and to 3.5 ft in one focused area near TP-6, to provide removal of the contamination above screening levels without the use of an REL, as described further below.

Soil removed from the Low Area would be excavated and disposed at a permitted offsite disposal facility. The lateral and vertical extents of contamination would be based on the testing results from the 2020 Low Area soil characterization sampling discussed in Section 2. Based on the preliminary laboratory analytical results, it is anticipated that excavating to 2.5 ft deep throughout the area shown on Figure 7 would result in the removal of approximately 1,800 tons of contaminated soil. Although some exceedances of the cleanup levels were observed in samples collected at 2 ft bgs, based on the rapidly decreasing trend in concentrations, it is anticipated that removal of 2.5 ft is likely to result in achieving cleanup levels in most areas. Anticipated removal in isolated areas with anomalously high concentrations at depth (e.g., 2-ft to 3-ft sample at TP-6) would likely extend to 3.5 ft bgs.

In recognition of the uncertainties involved in establishing the excavation depth and variability in soil concentrations, this alternative will include the same compliance monitoring at the floor of the excavation that is included in Alternative Two, and also the installation of a capping system to address potential residual contaminant concentrations.

Soil samples would be collected from the floor and sidewalls of the excavation to document final conditions. A steel mesh/geotextile layer, similar to the layer described in Alternative Two, would be placed at the floor of the excavation and the area would be backfilled with gravel then topsoil to restore the area to existing grade elevation. It is anticipated that, if trace levels of contamination are left in-place, the geotextile marker layer and new soil cover would be adapted as permanent Site features through environmental covenant. This alternative would provide a similar reduction in exposure risks as Alternative Two, though would provide slightly greater permanence through the removal of additional soil contamination. However, since the contaminant concentrations are very low in the additional soil that would be removed, the incremental additional reduction in contaminant mass would be small.

3.3.4 Alternative Four—Containment In-Place

This alternative would be identical to Alternatives Two and Three with regards to the shoreline restoration work. In the Low Area, Alternative Four would address contamination solely through containment measures. This would include installation of a soil capping system to prevent direct

contact exposures to Site contamination. This alternative would provide a greater level of environmental benefit in comparison to Alternative One, by reducing or eliminating exposure risks to humans or other ecological receptors. And, because the dioxins/furans contamination is known to be relatively immobile when adhered to soil particles beneath an effective containment system, further migration of contamination would not be expected. This alternative would be more cost-effective to implement than the alternatives that include soil removal for the shoreline restoration and habitat improvements. However, several disadvantages were identified. The anticipated environmental benefits would be lower than Alternatives Two and Three based on achieving no direct reduction of contamination concentrations, and would not as significantly improve habitat conditions. Further, capping efforts along the shoreline, if not combined with excavation and regrading activities, would increase the elevation profile along the shoreline and directly reduce the area of aquatic habitat area by moving the ordinary high water mark (OHWM) farther into the bay.

Because this alternative could provide temporary environmental protection and allow time for the RI/FS process to proceed, this alternative was retained for further consideration.

3.4 Selection of the Interim Action Alternative

This section summarizes the comparison of environmental and cost considerations and recommends a preferred alternative for implementation.

Alternative One was not considered practicable because an interim cleanup action is needed in the short-term to eliminate existing exposure pathways, and delaying action until the MTCA cleanup process is complete does not appropriately address the environmental concerns in a reasonable timeframe. This alternative is eliminated from further consideration.

Alternative Two provides a permanent and irreversible direct reduction in the amount of hazardous substances remaining at the Site, substantially reduces exposure pathways, and additionally provides much needed shoreline and wetland habitat improvements. The estimated cost for implementing the Low Area portion of this option including construction and compliance monitoring is approximately $217,000.

Alternative Three also provides a permanent and irreversible direct reduction in amount of hazardous substances remaining at the Site, and additionally provides much needed shoreline and wetland habitat improvements. This alternative provides additional environmental benefit over Alternative Two by providing for a more complete removal of contamination from the Site. The estimated cost for implementing the Low Area portion of this alternative is approximately $270,000, which is approximately a 25% increase of cost from Alternative Three. However, the additional soil removal included with this option has almost no impact on the environmental risks associated with the Site, since both alternatives would install effective surface containment barriers to prevent direct contact and prevent migration.

Alternative Four provides protection for human and other ecological receptors to direct contact exposures to contamination. The estimated cost for implementing the Low Area portion of this alternative is approximately $107,000. Although this alternative is far more cost effective than Alternative Two or Alternative Three, Alternative Four would not result in any permanent reduction in hazardous substances or habitat improvements, and is eliminated from further consideration based on these significant deficiencies in comparison to the other alternatives.

Based primarily on the noted deficiencies of Alternative One and Alternative Four, both of these alternatives were eliminated and only Alternative Two and Alternative Three are considered appropriate for implementation. Based on the estimated costs presented above, the incremental increase in additional costs for implementing Alternative Three is disproportionate to the anticipated environmental benefit in comparison to Alternative Two. As such, Alternative Two is considered permanent to the extent practicable for the purposes of this interim cleanup action. It is understood that the final determination of permanence and achievement of MTCA cleanup standards will be evaluated by Ecology later in the cleanup process.

4.0 IMPLEMENTATION OF THE INTERIM ACTION

The following sections provide a summary of the conceptual design and implementation strategy for the preferred alternative. Further details regarding the engineering basis of design and details to support implementation will be provided in the EDR, upon Ecology's approval of the conceptual approach presented below.

4.1 Description of the Preferred Interim Action

As described above, Alternative Two is selected as the preferred interim action. The general scope of work involves shoreline restoration and buffer enhancement measures along the shoreline as described in the CMP (Appendix B), and soil remediation along the south east portion of the Site (the Low Area).

The shoreline restoration work will clean up and restore approximately 1,300 linear ft of shoreline, and 2,200 linear ft of buffer area along the area shown on Figure 6, and as described in detail in the DCM (Appendix C). The restoration work generally includes removing anthropogenic debris and invasive plant species from the buffer and shoreline areas, reshaping the shoreline to more natural slopes using an excavator during low-tides (in the dry), and replanting the shoreline with native plant species. The conceptual excavation detail is presented in the generalized cross-section inset on Figure 6. The excavation will generally remove less than 10 ft of thickness, creating a smooth base for rebuilding and replanting the shoreline slope. Design slopes will be presented in the EDR, and will range from approximately 5 ft horizontal to 1 ft vertical (5:1) to 10 ft horizontal to 1 ft vertical (10:1). Excavation and slope regrading is anticipated to result in a substantial net increase in the extent of aquatic habitat, by area.

As indicated on Figure 6, several soil types are anticipated to be removed. The EDR will include details for managing the excavated debris, and is anticipated to include a combination of offsite-disposal at an appropriately permitted landfill facility, and re-use onsite as demonstrated appropriate through laboratory analyses, and in consultation with Ecology.

Existing bulkheads, wood debris, and invasive species will be removed, and the shoreline regraded with suitable materials to provide shoreline stabilization, erosion protection, and habitat enhancement. LWD will be placed along the upper extents of the beach slope and will be anchored in-place. Plant species, selected based on their water and light requirements, will be densely planted along the shoreline at elevations based on tolerance/functions with respect to tidal inundation and elevation, nursery availability, and successful establishment based on observations of species thriving in adjacent estuarine wetlands. LWD creates structure, improves soil water retention, and provides organic material to underlying soil. As it decays, it is colonized by fungi and insects that provide food for other animals providing long-term habitat enhancement.

The shoreline restoration cleanup will temporarily impact 722 square ft of existing wetlands, but will restore wetlands after grading the shoreline to a more natural slope and expand wetlands along the shoreline to create approximately 27,500 square ft of intertidal saltmarsh habitat – an approximate 4,000 percent increase in wetlands area. After the shoreline is graded, the restored shoreline will be densely vegetated with herbaceous wetland vegetation. This will provide erosion control, water filtration, and sediment stabilization and depositional functions in addition to habitat for invertebrates, juvenile fish, foraging shorelines, and upland wildlife species. Once established, the upper shore and riparian vegetation will provide a continuous native riparian corridor along the water for wildlife foraging, refuge, and nesting.

The Low Area excavation is simpler in comparison, and will generally include removal and offsite disposal of contaminated soil, and installation of a surface capping system to address trace residual contamination along the Port's south property boundary in the vicinity of the former W&W Everett Investments LLC property discharge pipe and back Low Area. Figure 7 presents the conceptual excavation plan, which will be further developed in the EDR to address soil contamination above the REL of 13 ng/kg dioxins/furans TEQ.

Based on the rapidly declining concentrations observed when comparing surface samples to those directly underlying, the design excavation will extend to a depth of approximately 1 ft bgs, across an area approximately ¼ acre in size. Additional focused excavation may be completed to a deeper depth in areas with concentrations above the REL at depth (areas around TP-4 and TP-6). The planned limits of the excavation will be detailed in the EDR, but generally will be defined by topography, and will extend as close as practical to the existing retaining wall in the southwest, a bulkhead to the west, a property boundary to the east, and will be limited in the north by the steep embankment. Based on the current Site understanding, contamination related to the unauthorized discharge is limited to the topographic Low Area where discharge pooled and infiltrated into the soil, and is not expected to extend laterally.

It is likely that the excavation will leave behind low-levels of dioxins/furans contamination, which will be evaluated through collection and analysis of soil samples at the floor of the excavation, as described in the compliance monitoring plan (CMP; Appendix B). Though existing soil characterization data indicates that, if soil above the REL is excavated as planned, compliance monitoring samples will likely meet cleanup standards, any residual contamination will be effectively managed through installation of a geotextile separation layer and installing a 2-ft thick soil cap. As illustrated on Figure 7, the northern portion of the excavation area is the planned future location of a stormwater outfall that may be constructed during planned development of the Site. The depth of excavation required for installation of this outfall is not expected to intersect with residual contamination (soil characterization samples below the planned excavation depth at the nearest sampling location, TP-1, indicate dioxin and furan TEQ concentrations of 6.51 ng/kg and 4.29 ng/kg, which are less than the human health direct contact SL of 13 ng/kg, and relatively equal to the overall screening level of 5.2 ng/kg). Where excavation below the geotextile separation layer will be necessary for this

construction, the activity will be coordinated with Ecology, the excavated soil will be managed as contaminated soil, and a geotextile/steel fabric separation layer will be replaced at the new maximum depth.

Earthwork activities completed for the shoreline restoration and Low Area excavation will include implementation of best management practices (BMPS). A temporary erosion and sediment controls (TESC) plan will be developed as part of the EDR, and will be followed to prevent erosion or damage to the area, to control stormwater runoff, protect nearby surface water, and meet substantive permitting requirements.

4.2 Schedule for Implementing the Interim Action

The schedule for implementing the Interim Action will follow the relational schedule detailed in the amended AO. That said, the Port may undertake the Low Area remediation separate and prior to the shoreline restoration in an effort to meet project sequence requirements with the developer. All interim action construction schedules will be coordinated between the Port and Ecology prior to mobilization, after additional detailed engineering design is completed.

Shoreline restoration and Low Area remediation efforts are anticipated to be initiated in the third quarter of 2020, and completed in the second quarter of 2021, depending on receipt of federal permits. Considering the global pandemic declared by the World Health Organization on March 11, 2020, and issuance of associated local, state, and federal rules and orders, it may not be possible for the project to occur on the timeframe listed above. The Port will strive to complete the work as soon as feasible considering these factors. Additionally, the interim action is being funded by Ecology remedial action grant funding.

4.3 Compliance Monitoring

A CMP has been developed for this interim cleanup action to provide details for implementing the necessary monitoring activities to demonstrate compliance with the regulatory requirements of WAC 173-340-400 (4)(b) and WAC 173-340-410, and/or other requirements as coordinated with Ecology. The CMP will include procedures for addressing the following activities:

- **Protection monitoring** to confirm that human health and the environment are adequately protected during construction, operation, and maintenance of the cleanup action.
- **Performance monitoring** to confirm that the cleanup action attains cleanup or performance standards.
- **Confirmational monitoring** to confirm the long-term effectiveness of the cleanup action once the cleanup standards and/or other performance standards have been attained.

The protection, performance, and confirmation monitoring requirements for this Interim Action are intended to ensure a safe, thorough, and effective implementation of the interim cleanup activities.

The CMP is provided as Appendix B to this IAWP. Also, a Maintenance and Monitoring Plan (MMP) specific to the shoreline restoration is included in the Bay Wood Shoreline Interim Cleanup and Restoration Plan (Shannon & Wilson 2019). This plan describes long-term performance goals, a monitoring and maintenance schedule, and contingency actions.

4.4 Integration with Final Cleanup Action and Future Land Use

The compliance monitoring data developed during implementation of the interim cleanup action will be reported to Ecology after concluding the work, and the data will be incorporated into subsequent drafts of the RI report. It is anticipated that the interim cleanup action will result in achieving cleanup standards and/or remediation levels in the shoreline and Low Areas, and that additional cleanup actions will not be required. However, the Port acknowledges that this will be further determined through completion of the RI/FS process.

The interim cleanup action has been developed consistent with the Port's and Ecology's understanding of future land uses, and will provide for upland redevelopment opportunities, public access to the shoreline, and enhanced wetland buffers and functionality.

4.5 Applicable, Relevant, and Appropriate Regulatory Requirements

The interim cleanup action is required under the Port's AO with Ecology. As such, the activities are typically exempt from requiring further authorization by local government through permits or approvals, although the action must still comply with the substantive requirements of such permits or approvals. In order to determine the substantive requirements, it may be necessary to coordinate with typical permitting agencies through the typical permitting application process.

The Interim Action requires compliance with the State Environmental Policy Act (SEPA), Chapter 43.21C of the Revised Code of Washington (RCW). This was achieved by conducting SEPA review in accordance with applicable regulatory requirements, including WAC 197-11-268, and Ecology guidance as presented in Ecology Policy 130A (Ecology 2004). Ecology and the Port conferred and agreed that the Port would act as the SEPA lead agency for this project. A Mitigated Determination of Non-Significance (MDNS) was issued on September 19, 2019 under Port SEPA reference number 2019-01.

Some of the activities in this IAWP will occur below mean high water, so the need for a Section 10/404 permit is also anticipated. The USACE anticipates issuing coverage under the Nationwide Permit 38 program. The State of Washington has already certified activities covered under this program, so individual Section 401 Water Quality Certification review is not required. Federal permitting will include Section 106 consultation between the USACE and State Historic Preservation Officer (SHPO) under the National Historic Preservation Act. Due to the presence of a USACE easement and structure in the vicinity of the project, the Port initiated consultation under the USACE's Section 408 program. A

Memorandum For the Record (MFR) was issued on April 11, 2019 stating that the project would not warrant Section 408 review.

The Port has prepared a Joint Aquatic Resources Permit Application (JARPA) for the interim action, and submitted to the Washington Department of Fish & Wildlife for Hydraulic Project Approval and to the USACE for Section 404/Section 10 permits. As part of the JARPA, a Habitat Assessment and a BA were prepared for the project to evaluate potential impacts from the project on habitat, the species listed as threatened or endangered in the action area under the Endangered Species Act, and Essential Fish Habitat (EFH) pursuant to the Magnuson-Stevens Act. Determinations of "no effect" or "not likely to adversely affect" were made. The project was determined to not adversely affect EFH.

A Hydraulic Project Approval (HPA) was issued by the Washington Department of Fish and Wildlife (WDFW).

The package was also provided to the City of Everett and they concluded that it would meet substantive requirements of the Shoreline Master Program and is, therefore, exempt from permit issuance.

5.0 USE OF THIS WORK PLAN

This Interim Action Work Plan has been prepared for the exclusive use of the Port of Everett and their agents for specific application to the Bay Wood Products Cleanup Site Project. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

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Data Source: Esri 2012

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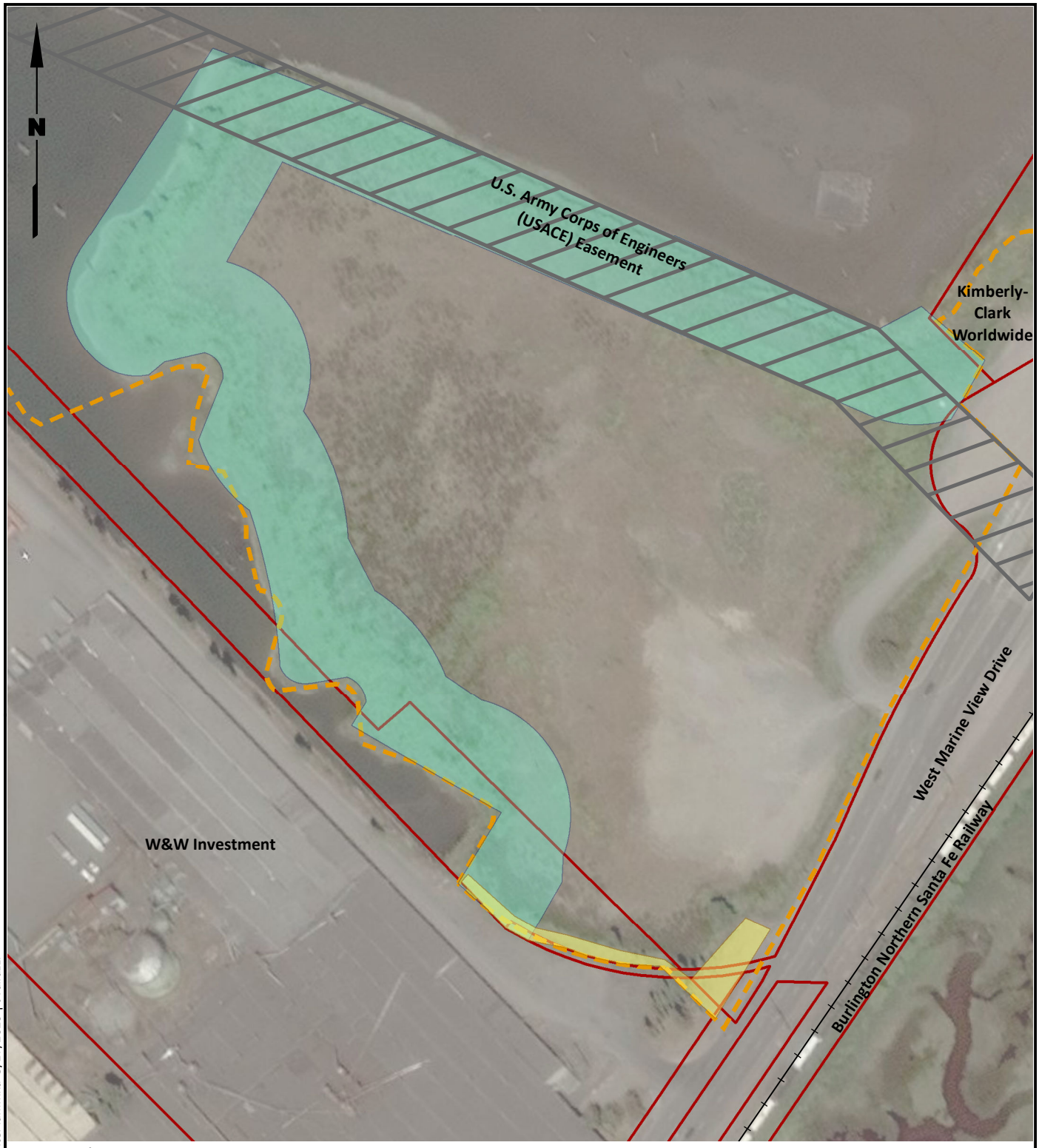
LANDAU ASSOCIATES

Bay Wood Products Interim Action Work Plan Everett, Washington	**Vicinity Map**	Figure 1



Legend

- Site Boundary (RI/FS 2018)
- Parcel Boundary
- Low Area
- Shoreline Restoration Area

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 170 340

Scale in Feet

Data Source: Shannon & Wilson, Inc.; 2019; Geoengineers, 2018
Base Map Source: ESRI World Imagery, 2020

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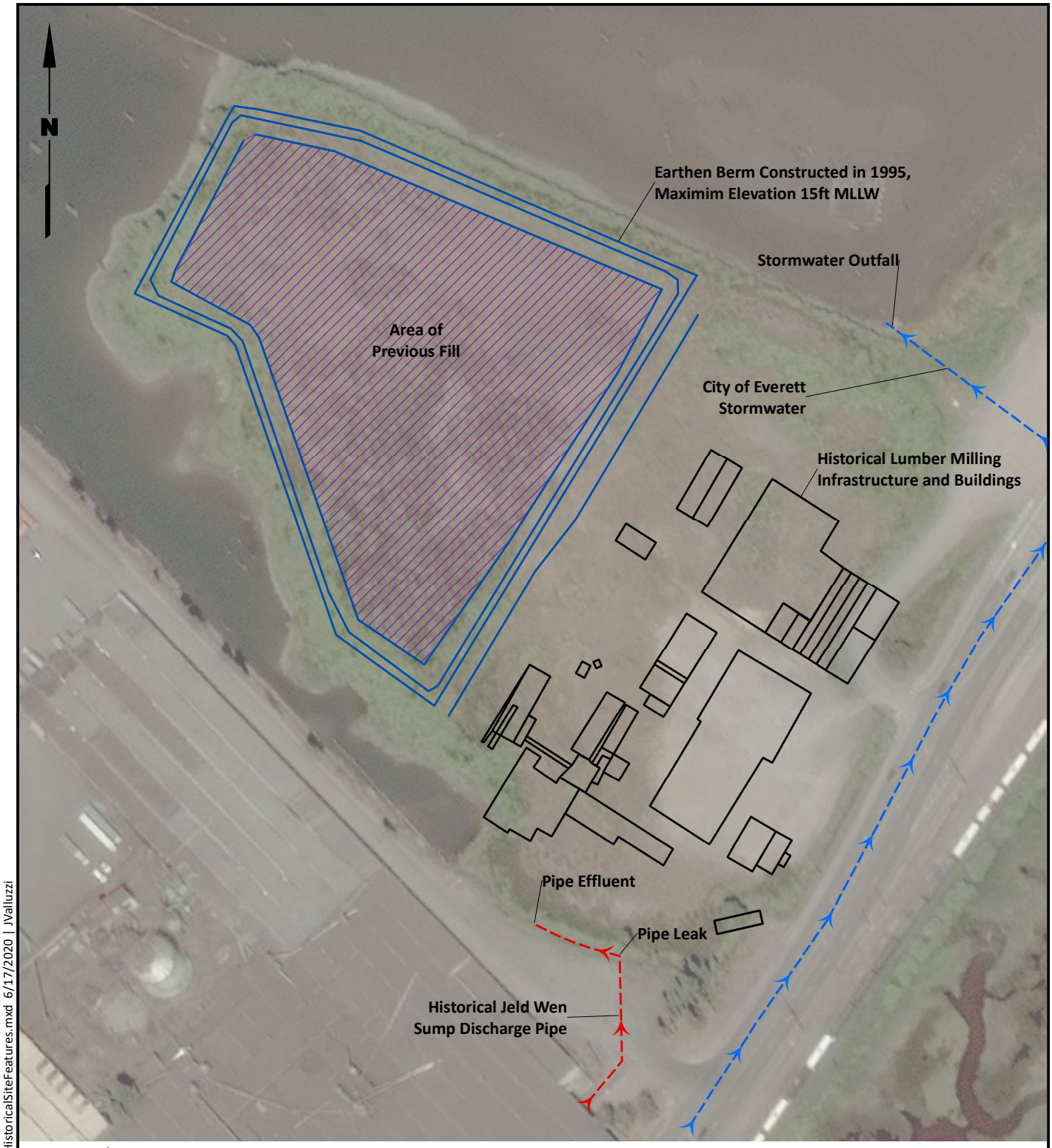
Bay Wood Products Interim Action Work Plan Everett, Washington	**Site Plan**	Figure 2



Legend

- Discharge Pipe
- City of Everett Stormwater
- Historical Feature

0 170 340

Scale in Feet

Notes

1. MLLW = Mean Lower Low Water
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: Shannon & Wilson, Inc.; 2019; Geoengineers, 2018
Base Map Source: ESRI World Imagery, 2020

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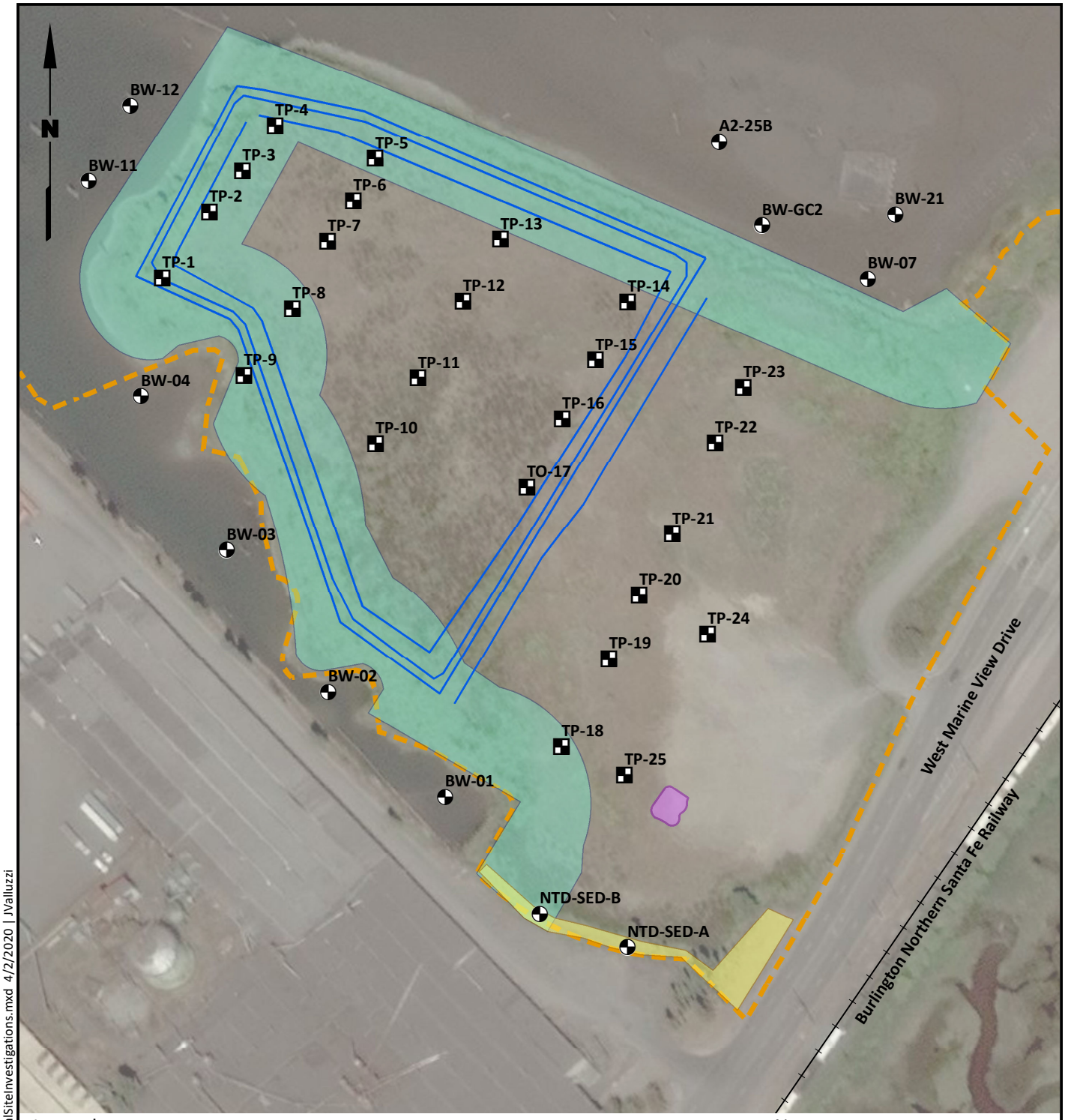
LANDAU ASSOCIATES

Bay Wood Products Interim Action Work Plan Everett, Washington	**Historical Site Features**	Figure 3



Legend

- Test Pit Location (SLR 2010)
- Sediment Sample Location (2009)
- Earthen Berm (1995)
- PCB Cleanup Area (1992-1993)
- Low Area
- Shoreline Restoration Area
- Site Boundary

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 170 340

Scale in Feet

Data Source: Shannon & Wilson, Inc.; 2019; Geoengineers, 2018
Base Map Source: ESRI World Imagery, 2020

G:\Projects\147\053\010\013\F04 HistoricalSiteInvestigations.mxd 4/2/2020 | JValluzzi

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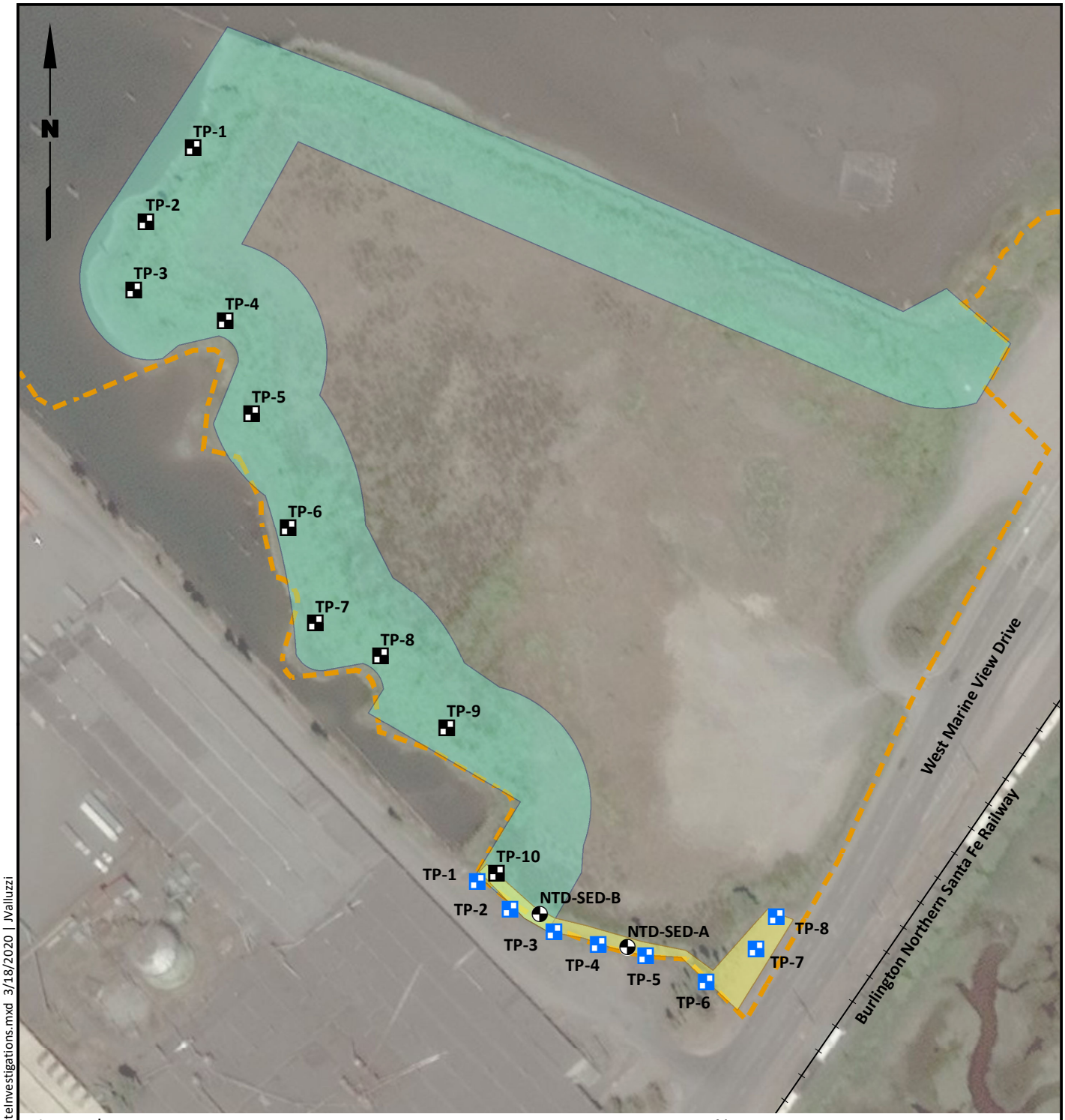
Bay Wood Products
Interim Action Work Plan
Everett, Washington

Historical Site Investigations and Cleanup Efforts

Figure 4



Legend

- Test Pit Location (Shannon & Wilson 2019)
- Test Pit Location (LAI 2020)
- Soil Sample Location (SLR 2018)
- Low Area
- Shoreline Restoration Area
- Site Boundary

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 170 340

Scale in Feet

Data Source: Shannon & Wilson, Inc.; 2019; Geoengineers, 2018
Base Map Source: ESRI World Imagery, 2020

G:\Projects\147\053\010\013\F05 RecentSiteInvestigations.mxd 3/18/2020 | JValluzzi

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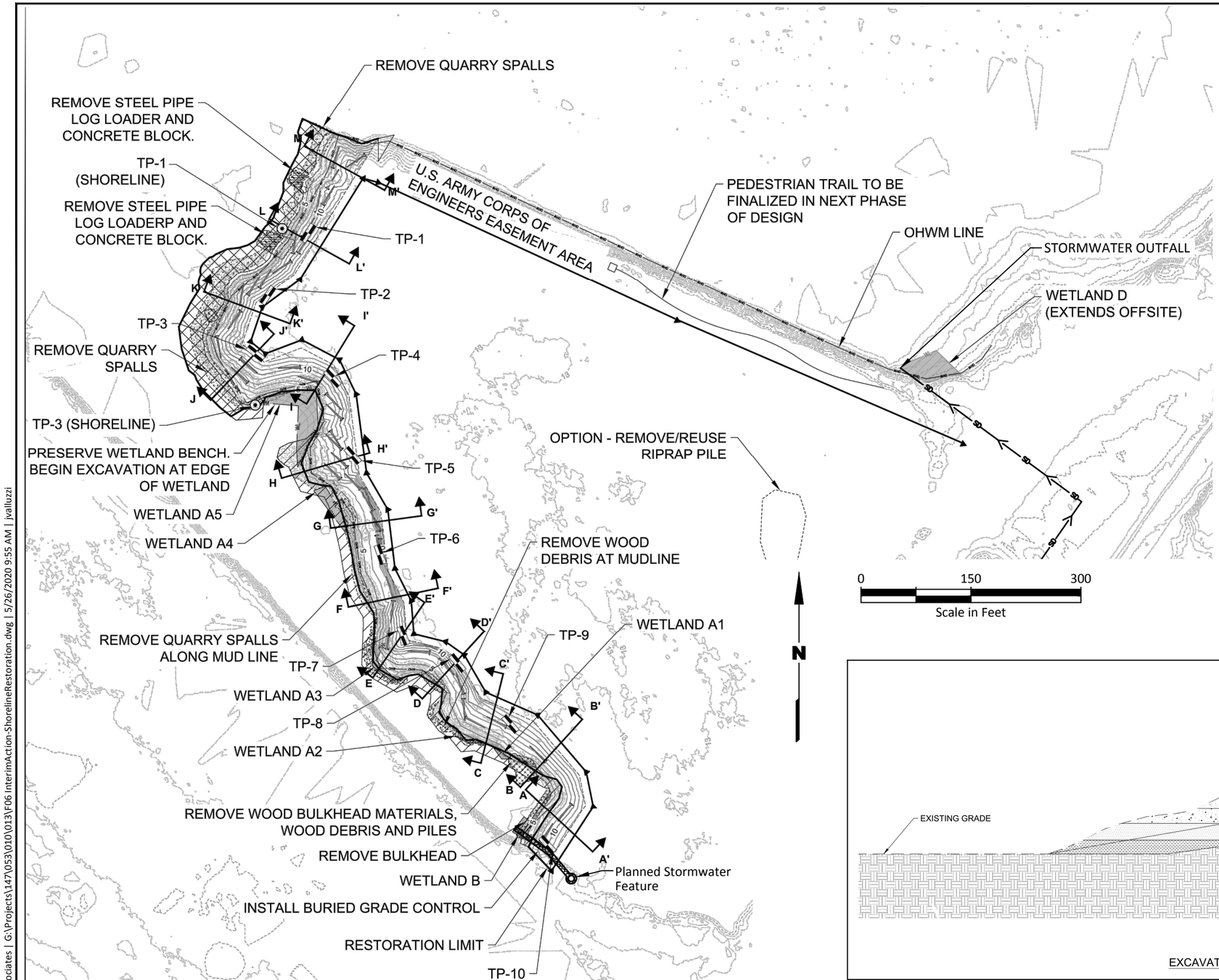
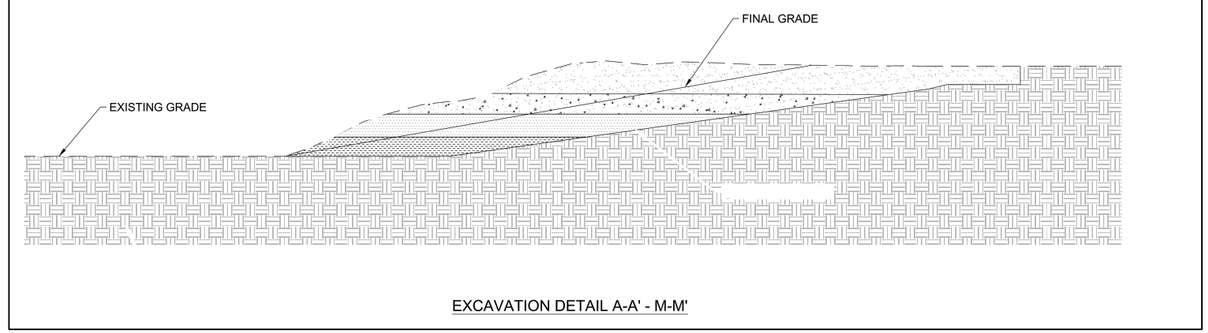
Bay Wood Products Interim Action Work Plan Everett, Washington	**Recent Site Investigations**	Figure 5



LEGEND

- MINOR DESIGN CONTOUR (1')
- MAJOR DESIGN CONTOUR (5')
- EXISTING MINOR CONTOUR (1')
- EXISTING MAJOR CONTOUR (5')
- GRADING LIMITS
- DEVELOPMENT BOUNDARY
- EXISTING EXTREME TIDE (8.6')
- EXISTING MHHL (5.4')
- OHW LINE
- RESTORATION LIMIT
- MATERIAL REMOVAL OUTLINE
- WETLANDS
- QUARRY SPALL REMOVAL (MACHINE)
- QUARRY SPALL REMOVAL (SPECIAL HANDLING)
- MARINE WOOD DEBRIS REMOVAL (SPECIAL HANDLING)
- MARINE WOOD & STEEL STRUCTURE REMOVAL (MACHINE)
- PORT DIRECTED OPPORTUNISTIC DEBRIS REMOVAL AREA
- PORT DIRECTED OPPORTUNISTIC DEBRIS REMOVAL AREA (SPECIAL HANDLING BEYOND RESTORATION LIMIT)
- LARGE WOODY DEBRIS (LWD)
- TP-1 — TEST PIT, APPROXIMATE LOCATION
- TP-1 (SHORELINE) — GRAB SAMPLE, APPROXIMATE LOCATION
- SD — CITY OF EVERETT STORMWATER



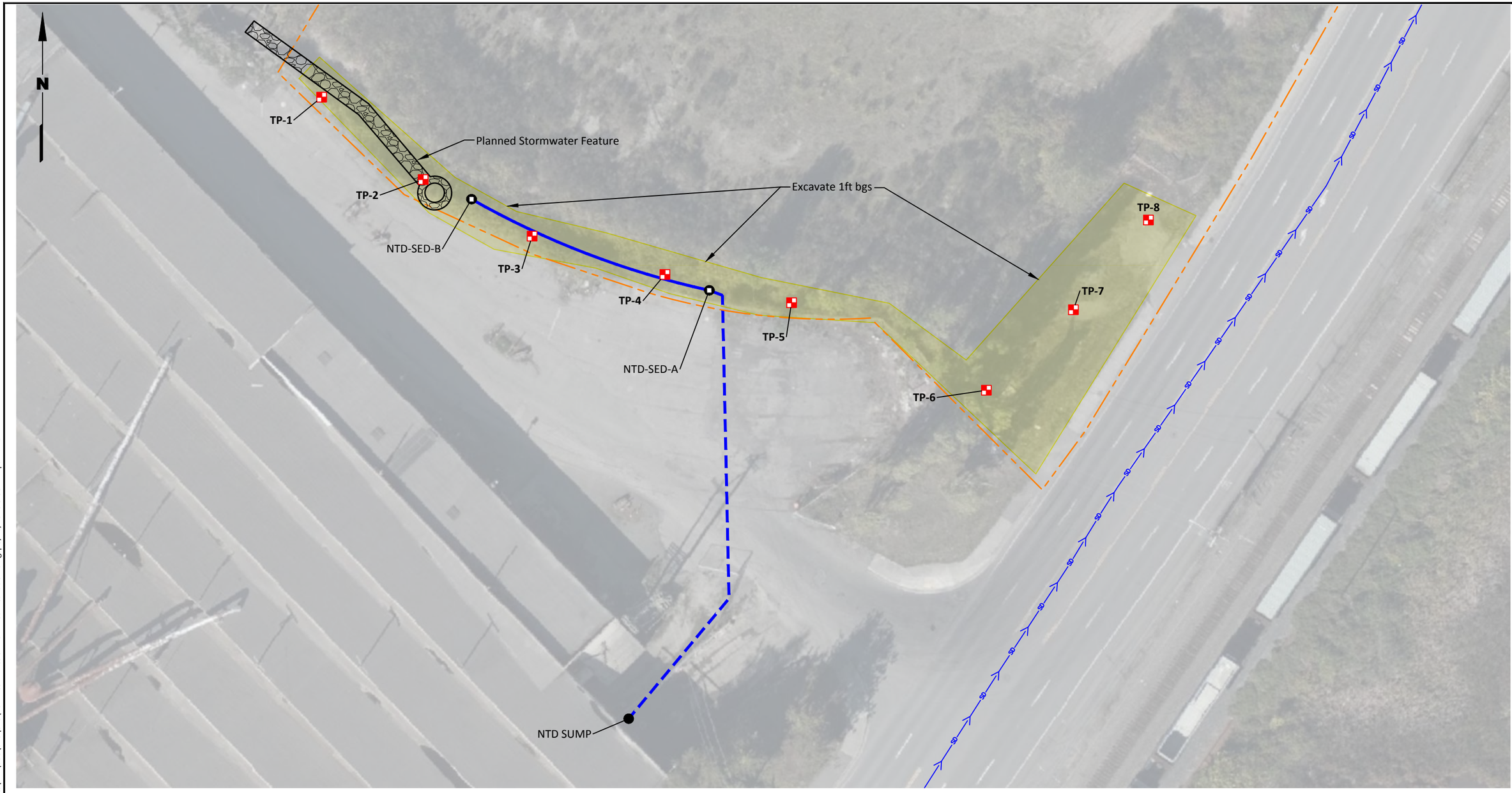
EXCAVATION DETAIL A-A' - M-M'

Source: Shannon & Wilson, Shoreline Restoration Plan, 30% Design Grading Plan, July 2019

Landau Associates | G:\Projects\147\053\010\013\F06 InterimAction-ShorelineRestoration.dwg | 5/26/2020 9:55 AM | jvalluzzi

LANDAU ASSOCIATES

Bay Wood Products Interim Action Work Plan Everett, Washington	**Interim Action - Shoreline Restoration**	Figure 6



Legend

- Test Pit Location
- Soil Sample Location (SLR 2018)
- Approximate Excavation Boundaries (To Be Further Delineated in the Engineering Design Report)
- City of Everett Stormdrain
- Aboveground Stormwater Conveyance
- Underground Stormwater Conveyance
- Site Boundary

0 40 80

Scale in Feet

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: GeoEngineers 2018; Metron 2018; SLR 2018; ©Bing 2019

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Bay Wood Products Interim Action Work Plan Everett, Washington	**Interim Action - Low Area Excavation**	Figure 7

Landau Associates | G:\Projects\147\053\010\013\F07 InterimAction-LowAreaExcavation.dwg | 5/26/2020 9:56 AM | JVALLUZZI

Table 1
Soil Analytical Results
Port of Everett Baywood

Analyte	RI/FS soil screening level (a)	Field Sample ID, Laboratory SDG, Sample Date																
		TP-1 (0 TO 0.5FT) EV20020103 2/18/2020	TP-1 (1 TO 2FT) EV20020103 2/18/2020	TP-1 (2 TO 3FT) EV20020103 2/18/2020	TP-2 (0 TO 0.5FT) EV19120046 12/6/2019	TP-2 (1 TO 2FT) EV20020103 2/18/2020	TP-2 (2 TO 3FT) EV20020103 2/18/2020	TP-3 (0 TO 0.5FT) EV19120046 12/6/2019	TP-4 (0 TO 0.5FT) EV19120046 12/6/2019	TP-4 (1 TO 2FT) EV20020103 2/18/2020	TP-4 (2 TO 3FT) EV20020103 2/18/2020	TP-5 (0 TO 0.5FT) EV19120046 12/6/2019	TP-6 (0 TO 0.5FT) EV19120046 12/6/2019	TP-6 (1 TO 2FT) EV20020103 2/18/2020	TP-6 (2 TO 3FT) EV20020103 2/18/2020	TP-7 (0 TO 0.5FT) EV20020103 2/18/2020	TP-8 (0 TO 0.5FT) EV20020103 2/18/2020	TP-8 (1 TO 2FT) EV20020103 2/18/2020
Total Petroleum Hydrocarbons (mg/kg; NWTPH-Dx)																		
Diesel-Range Organics	2,000	--	--	--	50 U	--	--	25 U	**410**	--	--	25 U	54 U	--	--	--	--	--
Oil-Range Organics	2,000	--	--	--	**690**	--	--	50 U	**1,400**	--	--	**170**	**540**	--	--	--	--	--
Carcinogenic Polycyclic Aromatic Hydrocarbons (mg/kg; SW-846 8270D SIM)																		
Benzo(a)anthracene	NL	--	--	--	**0.052**	--	--	0.02 U	0.02 U	--	--	0.02 U	**0.033**	--	--	--	--	--
Benzo(a)pyrene	NL	--	--	--	**0.065**	--	--	0.02 U	**0.021**	--	--	0.02 U	**0.045**	--	--	--	--	--
Benzo(b)fluoranthene	NL	--	--	--	**0.15**	--	--	**0.028**	**0.045**	--	--	0.02 U	**0.11**	--	--	--	--	--
Benzo(k)fluoranthene	NL	--	--	--	**0.036**	--	--	0.02 U	0.02 U	--	--	0.02 U	**0.029**	--	--	--	--	--
Chrysene	NL	--	--	--	**0.11**	--	--	0.02 U	**0.03**	--	--	0.02 U	**0.089**	--	--	--	--	--
Dibenzo(a,h)anthracene	NL	--	--	--	**0.026**	--	--	0.02 U	0.02 U	--	--	0.02 U	0.02 U	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	NL	--	--	--	**0.082**	--	--	0.02 U	**0.024**	--	--	0.02 U	**0.047**	--	--	--	--	--
cPAH TEQ (ND = 0)	0.14	--	--	--	**0.101**	--	--	**0.003**	**0.028**	--	--	0.02 U	**0.068**	--	--	--	--	--
Dioxins/Furans (ng/kg; SW-846 1613B)																		
2,3,7,8-TCDD	NL	1.01 U	0.578 U	0.585 U	**1.45**	0.612 U	0.590 U	0.532 U	**0.639**	0.621 U	0.506 U	0.548 U	**15.2**	**3.45**	**2.10**	**2.20**	0.607 U	**0.715**
1,2,3,7,8-PeCDD	NL	**15.8**	1.04 U	**0.851 J**	**9.19**	2.54 U	0.268 U	0.225 U	**6.11**	**3.87**	2.53 U	**1.30 J**	**42.8**	**9.77**	**6.09**	**16.3**	**3.33**	**3.89**
1,2,3,4,7,8-HxCDD	NL	**79.5**	**2.09 J**	**1.49 J**	**22.7**	**4.97**	**0.374 J**	**0.402**	**31.4**	**12.9**	1.06 U	**2.42 J**	**170**	**76.2**	**57.6**	**33.8**	**8.03**	**2.51 J**
1,2,3,6,7,8-HxCDD	NL	**173**	**8.11**	**4.32**	**60.2**	**17.5**	0.898 U	2.66 U	**102**	**35.7**	**8.58**	**5.28**	**289**	**40.2**	**178**	**89.6**	**27.4**	**8.91**
1,2,3,7,8,9-HxCDD	NL	**96.6**	**4.78**	**2.55 J**	**42.5**	**10.4**	0.679 U	**0.893 J**	**45.9**	**18.0**	**4.12**	**4.76**	**163**	**17.9**	**82.3**	**64.1**	**14.4**	3.61 U
1,2,3,4,6,7,8-HpCDD	NL	**5,960**	**278**	**137**	**1,830**	**498**	**27.1**	**33.7**	**7340**	**1,320 J-**	**244**	**146**	**13,000 J**	**2,090**	**12,300**	**2,590**	**1,050**	**215**
OCDD	NL	**41,600**	**2,890**	**1,330**	**17,000 J-EC**	**5,060 J-EC**	**253**	**260**	**100,000**	**12,900 J-EC**	**2,620**	**1,530**	**168,000 J**	**60,300 J-EC**	**93,600**	**24,600 J-EC**	**12,500 J-EC**	**2,580**
2,3,7,8-TCDF	NL	**3.53**	0.391 U	0.585 U	**2.20**	0.549 U	**0.234 J**	**0.257 J**	**1.74**	0.616 U	0.197 U	0.548 U	**5.24**	2.51 U	0.663 U	**2.48**	0.945 U	0.586 U
1,2,3,7,8-PeCDF	NL	3.62 U	0.508 U	0.373 U	**2.84 J**	0.971 U	0.268 U	0.206 U	**3.69**	1.55 U	0.331 U	**0.524 J**	**11.7**	1.99 U	0.850 U	**2.84 J**	**1.12 J**	**1.12 J**
2,3,4,7,8-PeCDF	NL	8.95 U	0.856 U	0.478 U	**6.88**	1.93 U	0.411 U	**0.259 J**	**10.0**	**3.85**	**0.721 J**	0.709 U	**24.9**	**5.98**	**2.13 J**	**7.32**	**4.14**	**4.79**
1,2,3,4,7,8-HxCDF	NL	**23.6**	**2.11 J**	**1.12 J**	**14.3 J**	**3.37**	0.450 U	**0.348 J**	**19.5**	**8.07**	**0.960 J**	**1.35 J**	**73.4 J**	**5.75**	**3.72**	**18.4**	**6.62**	**8.59 J**
1,2,3,6,7,8-HxCDF	NL	**23.8**	**1.90 J**	**1.21 J**	**16.0**	3.17 U	0.445 U	2.66 U	**16.3**	**6.99**	**0.866 J**	1.23 U	**75.4**	**7.13**	**3.30**	**15.4**	**4.37**	2.94 U
1,2,3,7,8,9-HxCDF	NL	**7.52**	2.89 U	2.92 U	**3.77**	2.74 U	2.95 U	2.66 U	4.58 U	3.09 UJ	2.53 U	0.516 U	**13.2**	2.80 U	0.752 U	3.57 U	3.03 U	**4.66**
2,3,4,6,7,8-HxCDF	NL	**33.1**	**2.49 J**	**1.62 J**	**22.9**	**4.97**	0.310 U	0.448 U	**23.4**	10.7 UJ	**1.33 J**	**2.11 J**	**94.0**	**13.1**	**6.30**	**23.8**	**5.72**	**3.65**
1,2,3,4,6,7,8-HpCDF	NL	**495**	**42.2**	**24.5**	**347**	**87.4**	**5.26**	**6.73**	**484**	**165 J-**	**27.6**	**28.9**	**1,400**	**101**	**62.4**	**455**	**108**	**26.9**
1,2,3,4,7,8,9-HpCDF	NL	**33.0**	**3.00**	**1.77 J**	**20.6**	**6.03**	0.404 U	0.306 U	**27.9**	8.46 UJ	1.17 U	**2.28 J**	**92.9**	**14.6**	**6.84**	**30.6**	**6.31**	**3.49**
OCDF	NL	**1,000**	**114**	**64.0**	**908**	**233**	**19.2**	**21.5**	**1,740**	**479**	**91.1**	**77.2**	**3,430**	**264**	**208**	**1420**	**358**	**72.5**
Total Tetra-Dioxins	NL	**15.9**	**0.960**	0.585 U	**9.51**	0.612 U	0.590 U	**0.939**	**9.26**	**1.97**	**1.44**	0.548 U	**135**	**103**	**18.1**	**6.16**	**5.45**	**9.98**
Total Penta-Dioxins	NL	**190**	2.89 U	**2.28 J**	**53.7**	**6.83**	2.95 U	**1.91 J**	**42.6**	**16.5**	**3.11**	**2.33 J**	**368**	**239**	**133**	**63.8**	**22.5**	**47.1**
Total Hexa-Dioxins	NL	**2,120**	**52.6**	**26.7**	**444**	**110**	**3.41**	**12.0**	**797**	**265**	**69.0**	**35.0**	**2,160**	**781**	**2970**	**710**	**211**	**75.4**
Total Hepta-Dioxins	NL	**13,100**	**506**	**255**	**3,360**	**955**	**46.6**	**63.6**	**10,600**	**3,370**	**498**	**264**	**19,000**	**5,350**	**18,700**	**5,890**	**2,320**	**431**
Total Tetra-Furans	NL	**25.4**	**1.97**	0.585 U	**29.5**	**0.581**	**0.570 J**	**1.01**	**24.7**	**1.47**	**1.49**	**1.64**	**88.9**	**43.5**	**3.73**	**17.9**	**12.0**	**18.3**
Total Penta-Furans	NL	**95.5**	**10.0**	**5.74**	**120**	**17.3**	2.95 U	**3.35**	**145**	**48.8**	**6.30**	**6.77**	**479**	**59.3**	**21.3**	**122**	**44.0**	**25.0**
Total Hexa-Furans	NL	**623**	**53.4**	**29.5**	**470**	**99.3**	**3.73**	**8.62**	**595**	**222**	**30.6**	**31.4**	**1,950**	**148**	**84.1**	**518**	**139**	**45.7**
Total Hepta-Furans	NL	**1,320**	**122**	**65.3**	**1,030**	**253**	**13.6**	**19.7**	**1,730**	**506**	**88.1**	**80.0**	**3,680**	**304**	**206**	**1,290**	**355**	**80.7**
Total TEQ (ND = DL/2)	13 (b)	**138**	**6.51**	**4.29**	**58.6**	**12.3**	**0.706**	**0.956**	**143**	**32.6**	**5.48**	**5.50**	**351**	**71.4**	**194**	**84.2**	**27**	**12.2**

Notes:

EC = The reported concentration exceeds the calibration range of the instrument.

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J- = The result is an estimated quantity and the result may be biased low.

Bold text indicates detected analyte.

Green shading indicates detected analyte exceeds applicable cleanup level.

(a) Vadose zone and saturated zones soil screening levels presented in draft RI/FS Table 4, Preliminary Soil Cleanup Levels, Geoengineers. June 22, 2018.

(b) Dioxin/furan TEQ soil screening level in the low area is based on the MTCA Method B human health direct contact pathway (13 ng/kg); the Sitewide for dioxin/furan TEQ based on background concentrations is 5.2 ng/kg

Abbreviations/Acronyms:

cPAH = carcinogenic polycyclic aromatic hydrocarbon

ID = Identification

mg/kg = milligrams per kilogram

MTCA = Model Toxics Control Act

ng/kg = nanograms per kilogram

NL = not listed

NWTPH = Northwest Total Petroleum Hydrocarbon

RI/FS = remedial investigation/feasibility study

SDG = sample delivery group

SIM = selected ion monitoring

TEQ = toxicity equivalency quotient

APPENDIX A

Select Low Area Photos, 2019–2020

LANDAU ASSOCIATES

Bay Wood Products
Interim Action Work Plan
Everett, Washington

Photograph TP-1

Figure
A-1

LANDAU ASSOCIATES

Bay Wood Products
Interim Action Work Plan
Everett, Washington

Photograph TP-4

Figure
A-2

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Bay Wood Products
Interim Action Work Plan
Everett, Washington

Photograph TP-8

Figure
A-3

APPENDIX B

Compliance Monitoring Plan

Final Compliance Monitoring Plan
Bay Wood Products Cleanup Site
Everett, Washington

July 27, 2020

Prepared for

Port of Everett
Everett, Washington

LANDAU ASSOCIATES

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Final
Compliance Monitoring Plan
Bay Wood Products Cleanup Site
Everett, Washington

This document was prepared by, or under the direct supervision of, the technical professionals noted below.

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Document reviewed by: _____ Jeremy D. Davis, PE
Quality Reviewer

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Project No.	0147053.010
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Project Coordinator:	tam

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TABLE OF CONTENTS

FIGURES

TABLES

APPENDIX

LIST OF ABBREVIATIONS AND ACRONYMS

BMP ..... best management practice
CESCL ..... construction erosion and sediment control lead
CMP ..... compliance monitoring plan
cPAH ..... carcinogenic polycyclic aromatic hydrocarbon
CQA ..... construction quality assurance
°C ..... degrees Celsius
DQO ..... data quality objective
Ecology ..... Washington State Department of Ecology
EDR ..... engineering design report
EIM ..... Environmental Information Management
Ft ..... feet
EPA ..... US Environmental Protection Agency
HASP ..... health and safety plan
IAWP ..... interim action work plan
IDW ..... investigation derived waste
LWD ..... large woody debris
MLLW ..... mean lower low water
MTCA ..... Model Toxics Control Act
NWTPH ..... Northwest Total Petroleum Hydrocarbon
OHWM ..... ordinary high water mark
oz ..... ounce
Port ..... Port of Everett
QA ..... quality assurance
QC ..... quality control
RI/FS ..... remedial investigation/feasibility study
RPD ..... relative percent difference
SAP ..... sampling and analysis plan
Site ..... Bay Wood Products Cleanup Site
SMS ..... Sediment Management Standard
SWPPP ..... stormwater pollution prevention plan
TEQ ..... toxicity equivalency quotient
TPH-O ..... total petroleum hydrocarbons – oil range
USACE ..... U.S. Army Corps of Engineers
WAC ..... Washington Administrative Code

1.0 INTRODUCTION AND BACKGROUND

This Compliance Monitoring Plan (CMP) presents the monitoring procedures that will be implemented by the Port of Everett (Port) during upcoming interim cleanup activities at the Bay Wood Products cleanup site (Site). The Port is currently working in partnership with the Washington State Department of Ecology (Ecology) to complete the remedial investigation/feasibility study (RI/FS) process to address contamination at the Site, located in Everett, Washington (Figure 1). Former uses of this Site included sawmilling operations and log storage activities that started in the 1930s and ceased in the mid-1990s. And while the portion of the property landward of the shoreline was cleaned up and backfilled with Snohomish River dredge sands by the Port in the 1990s, the shoreline remains challenged by a low functioning, publicly inaccessible shoreline that has scattered industrial debris, over-steepened shoreline embankment made of quarry spalls and wood debris, dilapidated creosote-treated bulkheads, other unnatural features, and is overgrown with invasive plant species. These environmental challenges will be resolved by this interim action, in addition to the soil remediation in the topographic Low Area (Low Area). The interim action will include cleanup activities at the Site that will be implemented in advance of completing the RI/FS currently in process. The details of the interim cleanup action are further detailed in the Interim Action Work Plan (IAWP) and the Engineering Design Report (EDR; prepared under separate cover), and are only briefly summarized in this CMP.

The interim cleanup activities are not anticipated to be the final cleanup actions for this Site, but were determined by Ecology and the Port as necessary actions that must be taken as part of the Site revitalization efforts and prior to initiating the next phases of the Model Toxics Control Act (MTCA) cleanup process. The interim cleanup activities generally include the removal and offsite disposal of contaminated materials, and shoreline and wetland habitat restoration. These activities are designed to be implemented in advance of the final cleanup action for the Site and, as required by Washington Administrative Code (WAC) 173-340-430(3)(b), will be implemented in a manner that does not prevent the implementation of other reasonable alternatives for the final cleanup action.

The monitoring procedures presented in this CMP were developed to demonstrate compliance with the procedural requirements of WAC 173-340-430 related to interim cleanup actions implemented under the MTCA. This CMP is a required component of the IAWP, included in the recent amendment to the Agreed Order (No. DE 5490, dated 4 Feb 2020) between the Port and Ecology.

1.1 Site Description

The Site is located at 200 West Marine View Drive, near the confluence of the Snohomish River and Port Gardner Bay (Figure 1), and consists of approximately 41.3 acres of upland and aquatic land owned primarily by the Port. The upland portion of the Site extends into Port Gardner Bay with a maximum elevation of approximately 15 feet (ft) above mean sea level. Although a portion of the Site may extend into Gardener Bay, into land owned by the State of Washington and managed by the

Washington Department of Natural Resources (DNR), all of the work proposed herein will occur upland of the inner harbor line on land owned by the Port. The southern portion of the Site lies within the 100-year floodplain of the Snohomish River according to mapping completed in 2016. The in-water portion of the Site consists primarily of tideland mudflats ranging in elevation from approximately 0 to 6 ft mean lower low water (MLLW).

The Snohomish County parcel numbers associated with the Site, and owned by the Port, include 29050700101000, 29050700100300, and 29050700100500. The Site is bordered on the north by a vacant lot owned by Kimberly-Clark Worldwide, Inc. (Kimberly-Clark; parcel number 29050700100100) and bordered on the south by the W&W Everett Investments LLC property (parcel number 29050700100400). The W&W Everett Investments LLC property is part of the "Jeld-Wen" MTCA Site, and is currently undergoing cleanup under an agreed order with Ecology.

The U.S. Army Corps of Engineers (USACE) manages an easement measuring approximately 100 ft wide that is used to access a training wall that diverts the main flow of the Snohomish River north of Jetty Island. This easement encompasses approximately 4.1 acres of the Site, as shown on Figure 2.

At the southern end of the Site, there is a topographic Low Area that consists of a narrow surface depression approximately 15 ft wide elongated from east to west between the W&W Everett Investments LLC property and the Bay Wood Site. The depression widens to approximately 30 to 40 ft wide and extends north along West Marine View Drive (Figure 4). The east/west-oriented portion of the Low Area is topographically bounded to the south by an approximately 2-ft high retaining wall located on the Jeld-Wen site, and to the north by approximately 6 ft of fill in the upland portion of the Site; the north/south-oriented portion of the Low Area is laterally bounded to the west by the fill on the upland portion of the Site, and to the east by West Marine View Drive. In 2017, it was observed that water was being pumped from a sump located in the W&W Everett Investments LLC property truck bay (North Truck Dock Sump Drain) into the Low Area (Port property; see Figure 3) without authorization from the Port. The discharge appeared to be derived from several sources including roof-water runoff, roadway stormwater drainage, and groundwater. Under the direction of Ecology, surface soil samples were collected by Jeld-Wen Inc. from the Low Area in 2018 at both the discharge point and at the end of a conveyance pipe. Laboratory analysis of these samples indicated the presence of carcinogenic polycyclic aromatic hydrocarbon (cPAHs), dioxins/furans, and residuals range total petroleum hydrocarbons (TPH-O) at concentrations above preliminary cleanup levels (PCLs) for the Site (SLR 2018).

1.2 Interim Cleanup Action Description

The interim cleanup action will address two primary environmental concerns by the removal of hazardous substances to prevent exposure to or migration of these materials; and by improving shoreline and wetland habitat.

The shoreline restoration work will clean up and restore approximately 1,300 linear ft of shoreline and 2,200 linear ft of buffer habitat area, in the area shown on Figure 2, by removing invasive plant species from the buffer and shoreline areas, and debris from the shoreline, and reshaping the shoreline to more natural slopes. The excavation will generally remove less than 10 ft of thickness, creating a smooth base for rebuilding and replanting the shoreline slope. Design slopes will be presented in the EDR, and will range from approximately 5 ft horizontal to 1 ft vertical (5:1) to 10 ft horizontal to 1 ft vertical (10:1). Excavation and slope regrading is anticipated to result in a substantial net increase in the extent of aquatic habitat, by area. The excavated debris will be managed in accordance with chemical and geotechnical properties, and the ultimate disposition may be at an offsite permitted disposal facility based on waste characterization sampling (further detailed in Section 2.2), or reused onsite, if determined appropriate through consultation with Ecology.

The removal activities along the shoreline will include soil/sediment, woody debris, rubble, invasive species, and existing bulkheads. After the removal and slope regrading, large woody debris (LWD) will be placed along the upper extents of the beach slope and will be anchored in-place. Plant species, selected based on their water and light requirements, will be densely planted along the shoreline at elevations based on tolerance/functions with respect to tidal inundation and elevation, nursery availability, and successful establishment based on observations of species thriving in adjacent estuarine wetlands. Existing native trees will be retained to the extent feasible. Any removed trees will be used as LWD along the shoreline. Once established, the upper shore and riparian vegetation will provide a continuous native riparian corridor along the water for wildlife foraging, refuge, and nesting.

The Low Area excavation will generally include removal and offsite disposal of contaminated soil along the Port's south property boundary in the vicinity of the W&W Everett Investments LLC property discharge pipe and Low Area, as shown on Figure 3. The excavation will be designed to remove soil contaminated by releases of dioxins/furans above a remediation level of 13 nanograms per kilogram (ng/kg) dioxins/furans toxicity equivalency quotient (TEQ), which is presented in the IAWP. However, the extent of excavation may be somewhat limited for practical considerations, and residual contamination above the dioxin/furan screening level of 13 ng/kg may remain in-place after the excavation is completed. The excavation is expected to extend to depths up to 1 ft below ground surface (bgs), across an area approximately ¼ acre (or 10,800 square ft) in size. Additional focused excavation will be planned in areas below the upper 1 ft of soil with contaminant concentrations greater than the REL (e.g., at TP-4 and TP-6); this excavation would be planned in coordination with Ecology and detailed in the EDR. The excavation will generally extend as close as practical to the existing retaining wall in the southwest, the bulkhead to the west, a property boundary to the east, and will be limited in the north by the steep embankment. Further information on the design of this excavation will be presented in the EDR, which will be prepared following finalization of the IAWP.

1.3 Schedule

The schedule for implementing the Interim Action will follow the relational schedule detailed in the amended Agreed Order. The Port will likely undertake the Low Area remediation separate and prior to the shoreline restoration in an effort to meet project sequence requirements with the developer. All interim action construction schedules will be coordinated between the Port and Ecology prior to mobilization, after additional detailed engineering design is completed.

It is anticipated that the interim cleanup action in the Low Area will be implemented separately from the shoreline restoration and will be implemented as soon as the second or third quarter of 2020, and will require 2 to 4 weeks of field activities to complete the excavation and placement of the geotextile separation layer.

Shoreline restoration efforts are anticipated to be initiated in the second or third quarter of 2020, and completed in the first or second quarter of 2021, depending on receipt of federal permits. Also, during design of the shoreline restoration, analytical samples were collected in March 2020 for waste characterization purposes; depending on the final design and implementation of the shoreline restoration, these samples may be applicable as compliance monitoring samples, and are discussed in further detail in Section 3.1.1. Considering the global pandemic declared by the World Health Organization on March 11, 2020, and issuance of associated local, state, and federal rules, orders and otherwise, it may not be possible for the project to occur on the timeframe listed above. The Port will strive to complete the work as soon as feasible considering these factors. Additionally, the interim action is being funded by Ecology remedial action grant.

2.0 COMPLIANCE MONITORING OBJECTIVES

This CMP addresses compliance monitoring for the interim cleanup action, consistent with the requirements of the MTCA [WAC 173-340-400 (4)(b) and WAC 173-340-410], which require compliance monitoring for cleanup actions to address:

- **Protection monitoring** to confirm that human health and the environment are adequately protected during construction, operation, and maintenance of the cleanup action.
- **Performance monitoring** to confirm that the cleanup action attains cleanup or performance standards.
- **Confirmational monitoring** to confirm the long-term effectiveness of the cleanup action once the cleanup standards and/or other performance standards have been attained.

The protection, performance, and confirmation monitoring requirements for this Interim Action cleanup are intended to ensure a safe, thorough, and effective implementation of the cleanup activities. A Maintenance and Monitoring Plan (MMP) specific to the shoreline restoration is included in the Bay Wood Shoreline Interim Cleanup and Restoration Plan (Shannon & Wilson 2019a). This plan describes long-term performance goals, a monitoring and maintenance schedule, and contingency actions. The following subsections present the objectives of this CMP, and Section 3 summarizes the procedures for implementing this CMP.

2.1 Protection Monitoring

This section describes planned monitoring activities for the protection of human health and the environment during implementation of the interim cleanup action.

Protection of Human Health

Monitoring for protection of human health addresses worker safety for activities related to construction, operation, and maintenance of the cleanup action and will be addressed through a project health and safety plan (HASP) that will be included in the EDR. Additionally, a requirement for the earth-work contractor to prepare a project-specific HASP will be included in the project plans and specifications. The HASPs will address monitoring for and potentially mitigating physical and chemical hazards associated with Site activities, consistent with the requirements of WAC 173-340-810.

Anticipated potential physical hazards include working in proximity to heavy equipment, heat stress or cold stress, dust monitoring and suppression, vehicular traffic, and contaminated soil and groundwater. Anticipated potential chemical hazards include exposure to Site contaminants through various exposure pathways (i.e., direct contact, dust inhalation, and ingestion).

Protection of the Environment

Environmental protection monitoring will be conducted during the construction activities. This will include visual monitoring for dust, preparation and implementation of a stormwater pollution

prevention plan (SWPPP), and implementation and monitoring of best management practices (BMPs) to minimize dust generation and/or control stormwater runoff from contaminated soil cleanup during construction. The requirement for a SWPPP will be included in the project plans and specifications.

During construction, a representative of the Port that is a certified construction erosion and sediment control lead (CESCL) will monitor performance of the BMPs and recommend changes in approach or application, if required. Environmental protection monitoring will include visual monitoring to verify that excessive dust is not generated and that stormwater runoff is not being impacted.

2.2 Performance Monitoring

Performance monitoring will include verifying the physical limits of planned excavation and filling activities are attained. Survey control points will be provided in the construction plans and specifications, which will be used by the contractor to guide excavation efforts and check that excavation is conducted as planned. A representative of the Port will conduct construction observation and work with contractors to confirm adherence to the excavation plans.

In addition to verifying the planned removal efforts, samples will be collected from the base and sidewalls of the Low Area excavation to document the work performed and remaining conditions.

Following completion of excavation to the planned excavation elevations, additional compliance monitoring samples will be taken to further assess final disposition of the excavated soil and to document remaining conditions. Samples collected during March 2020 test pit excavations for waste characterization purposes may also be applicable for use as performance monitoring samples. Test pits were excavated at ten locations (TP-1-20 through TP-10-20) evenly spaced within the shoreline restoration area illustrated on Figure 3; specific locations are presented on Figure 1 of the 2019 Test Pit Findings and Soil Management Plan (Shannon & Wilson 2019b), which is included in Appendix A; two of these test pits (TP-9-20 and TP-10-20) were excavated within or near the Low Area excavation area. This work was completed following completion of an archeological and cultural resources consultation in accordance with Executive Order 05-05that was conducted in coordination with Ecology. Six total analytical samples were collected from these test pits; analytical samples were collected at locations and depth intervals where field screening indicated the test pits had advanced through the dike construction materials and into the wood waste layer, where potential contamination is the greatest. Soil samples were analyzed for the analyses summarized in Table 1; samples from the two test pits nearest the Low Area (TP-9-20 and TP-10-20) were analyzed for two additional parameters, dioxins/furans, and polychlorinated biphenyls (PCBs) based on historical detections in sediment samples and the close proximity to the Low Area. These analytical samples were collected for waste characterization purposes, but will be included with project reporting and records associated with the Interim Action, and may be relevant during completion of the RI/FS. The data collected during this March 2020 sampling and analysis is presented in Appendix A.

This performance monitoring will be used to assess cleanup performance in the Low Area and to record conditions during the shoreline restoration, but may not necessarily trigger further removal efforts. The need for additional cleanup efforts will be addressed later, as needed, during implementation of the final cleanup action.

2.3 Confirmation Monitoring

Confirmation monitoring is generally used to document the long-term effectiveness of a cleanup action, and demonstrate compliance with MTCA cleanup standards. Some of the performance monitoring samples will be used to confirm compliance by demonstrating contaminant removal is complete in certain areas or to record the conditions; soil characterization samples collected prior to implementation of the interim action may also be applicable for use as confirmation monitoring samples. The Port will assess the data in cooperation with Ecology.

3.0 SAMPLING AND ANALYSIS PLAN

This section presents a Sampling and Analysis Plan (SAP) for conducting compliance monitoring related to performance and confirmation monitoring, primarily to characterize soil and sediment in the two areas that will be addressed during the interim cleanup action. The field activities will be conducted by personnel trained and experienced in sample collection procedures. Personnel will review this CMP and keep a copy onsite during sample collection activities to ensure these approved procedures are implemented in support of the project's data needs and quality objectives.

The analytical results for samples collected in the shoreline restoration area will be used to support final disposition of soils, and the analytical results for samples collected at the excavation floor in the Low Area excavation area will be used to document the final in-place conditions after the interim cleanup action has been completed.

Other aspects of compliance monitoring will be addressed through construction quality assurance (CQA), which is adapted as part of the compliance monitoring approach for the purposes of informing compliance to MTCA cleanup regulations. CQA includes efforts for surveying earthwork activities, monitoring BMPs for protectiveness of the adjacent surface water, and visual monitoring for dust generation.

3.1 Soil Sample Collection

Sampling activities will be conducted in the Low Area for confirmation sampling post-excavation activities, and along the shoreline to characterize potentially contaminated soil generated during construction or found at the base of the excavation, and along select excavation sidewalls. Figure 3 shows the proposed base sample locations; additional samples in the shoreline restoration area, if any are needed, will be recorded and shown on a figure at the completion of the project. Soil characterization data collected in the shoreline restoration area prior to implementation of the interim action, will determine handling and reuse/disposal procedures for excavated soil, and will be presented in the EDR.

3.1.1 Sampling Approach—Shoreline Restoration Area

Confirmation samples will be collected during the shoreline restoration to document conditions of soil remaining prior to placement of any topsoil and/or habitat improvement fill. A minimum of 7 samples will be collected; the proposed confirmation sampling locations are presented on Figure 3. Sampling locations may be adjusted in the field to areas with the greatest potential contamination at the base of the excavation. Potential contamination will be evaluated using field-screening techniques, including volatile organic compound (VOC) headspace testing using a photoionization detector, sheen test, and visual and olfactory observations. If field screening indicates potential contamination, over-excavation may be conducted based on consultation between the Port and Ecology. Based on this consultation, it is possible that up to one additional foot of soil may be excavated prior to collection of

confirmation samples. This potential over-excavation will be detailed further in the EDR. This data may be augmented, if applicable, by additional information provided by the samples collected in March 2020 during design of the shoreline restoration for waste characterization purposes.

If sampling occurs below the ordinary high water mark (OHWM), the samples will be collected during low-tide conditions from the uplands, in a manner consistent with typical upland soil sampling. Samples will be compared to Sediment Management Standard (SMS) criteria in the construction completion report, and criteria for final evaluation in the RI/FS will be selected in coordination with Ecology. Waste characterization samples collected in March 2020, which may augment compliance monitoring, were collected following the same proposed sampling approach.

The required analyses, sample glassware, sample holding times, and preservatives are discussed further in Section 3.2 and summarized in Table 1 and Table 2.

3.1.2 Soil Sampling Approach—Low Area Excavation

In the Low Area, samples were already collected to characterize the area sufficiently to design the excavation. After completing the excavation, since some residual contamination may remain in-place, the Port will collect up to six soil samples from the bottom of the excavation, in the approximate locations shown on Figure 3. Samples will not be collected in areas where asphalt is present at the bottom excavation depth (potentially in the northeast portion of the excavation area). Five sidewall samples will also be collected from the excavation sidewalls on the Bay Wood Site (e.g., sidewall samples will not be collected from the retaining wall between the Bay Wood Site and the Jeld Wen site, or where shoreline restoration will remove the sidewall at the north end of the Low Area) at a frequency of approximately one sample per 100 linear feet of sidewall. Soil samples may be adjusted to areas of greater potential contamination based on field-screening observations. The proposed confirmation soil sampling locations are shown on Figure 3.

Samples will be analyzed for dioxins/furans, which were determined to be the primary contaminants in the Low Area during previous soil characterization activities. Analytical results of the composite samples will be used to evaluate the effectiveness of the interim cleanup activities and confirm in-place conditions after the excavation has been completed. Due to the extended timeframe for laboratory analysis of dioxins/furans, and the additional time to complete the data validation procedures, it is estimated that results will not be available for approximately one month after sample collection. As a result of the physical limitations on the extent of excavation boundaries, and the extended timeframe for developing the analytical data, the data will unlikely be useful for modifying excavation plans during the interim action, or “chasing” the contamination. As such, the proposed base sample locations are spaced throughout the area on a regular grid, so the sample results will adequately represent the soil remaining in-place to maximize the usefulness of the data for later incorporation into the RI data set.

3.1.3 Sample Collection Procedures

Personnel trained and experienced in sample collection procedures will collect and preserve samples at the Site, and transport the samples to ALS Laboratories for analysis. During sample collection, the sampler will wear clean, dedicated nitrile gloves to prevent cross-contamination. For samples documenting conditions at the base of each excavation area, a discrete sample representing the upper 1 ft remaining will be collected for analysis. For samples documenting conditions at the sidewall of an excavation area, a composite sample will be collected from the full depth of the excavation. Samples will be collected using a clean, decontaminated stainless-steel sampling spoon, and placed into a decontaminated stainless-steel bowl for homogenization before transfer to the appropriate laboratory-supplied sample containers. Any visible organic constituents (leaves, roots, etc.) will be removed from the sample prior to placement in sampling jars. The sample jars will be labeled with the sample location, placed into a cooler with ice to be maintained at a temperature below 6 degrees Celsius (°C), and sealed under chain of custody until submitted to an Ecology-accredited laboratory for analyses.

The following table summarizes sample glassware, preservation requirements, and the maximum time-limit for analysis to occur (hold time) in order to prevent sample degradation.

Table 1. Sample Glassware and Preservation

Analyses	Sample Container	Sample Preservation	Maximum Holding Time (Days)
Shoreline Restoration – Soil Samples			
Metals: *Arsenic, cadmium, copper, nickel, selenium, silver, thallium*	1 x 8-oz glass	Store cool below 6°C	6 months
Petroleum Hydrocarbons: *Diesel and Oil Range*	1 x 8-oz glass	Store cool below 6°C	14 days
Semivolatile Organic Hydrocarbons: *cPAHs*	1 x 8-oz glass	Store cool below 6°C	14 days to extract, then 40 days to analyze
Polychlorinated Biphenyls (PCBs; two samples at south end of shoreline only): *PCB Congeners*	1 x 8-oz amber glass	Store cool below 6°C	1 year
Dioxins/Furans	1 x 8-oz glass	Store cool below 6°C	1 year to extract, then 40 days to analyze
Low Area Excavation – Soil Samples			
Dioxins/Furans	1 x 8-oz glass	Store cool below 6°C	1 year to extract, then 40 days to analyze

Abbreviations and Acronyms:
°C = degrees Celsius
cPAH = carcinogenic polycyclic aromatic hydrocarbons
EPA = US Environmental Protection Agency
NWTPH = Northwest Total Petroleum Hydrocarbon
oz = ounce

3.1.4 Equipment Decontamination and Management of IDW

Sediment and soil sampling equipment (e.g., stainless-steel bowls, stainless-steel spoons, etc.) will be decontaminated before each use, or personnel will use dedicated equipment. Decontamination will use a three-step process, as follows:

- Scrub surfaces of equipment that would be in contact with the sample with brushes using an Alconox® and water solution.
- Rinse and scrub equipment with clean tap water.
- Rinse equipment a final time with de-ionized water to remove tap water impurities.

Following completion of field activities, if investigation derived waste (IDW) is generated, it will be limited to sample-sized aliquots of soil, or small amounts of rinse-water. This minor generation will be direct-loaded with contaminated soil for offsite disposal. Sample gloves, spoons, plastic equipment, and/or other single-use materials will be bagged and disposed with ordinary municipal solid waste.

3.2 Laboratory Analytical Methods

Soil samples will be submitted to ALS Laboratory in Everett, Washington for the analyses summarized in Table 2 below.

Table 2. Analytical Methods and Reporting Limit Goals

Analyses	Analytical Method	Reporting Limit Goal (1)
Shoreline Restoration – Sediment Samples		
Metals: *Arsenic, cadmium, copper, nickel, selenium, silver, thallium*	EPA Method 6020A	0.2, 0.1, 0.5, 0.5, 0.5, 0.2, 0.2 (milligrams per kilogram [mg/kg])
Petroleum Hydrocarbons: *Diesel and Oil- Range*	NWTPH-Dx	25/50 (mg/kg)
Semivolatile Organic Hydrocarbons: *cPAHs*	EPA Method 8270D	5 (micrograms per kilogram [µg/kg])
Polychlorinated Biphenyls (PCBs; two samples at south end of shoreline only): *PCB Congeners*	EPA Method 1668A	2.5 (pg/g)
Dioxins/Furans	EPA Method 1613B	1 (ng/kg)
Low Area Excavation – Soil Samples		
Dioxins/Furans	EPA Method 1613B	1 (ng/kg)

Notes:

1. The target reporting limits are only goals because instances may arise where sample concentration, heterogeneity of samples, or matrix interferences preclude achieving the desired reporting limits and associated quality control criteria. If this occurs, the laboratory will report the reason(s) for deviations from these reporting limits or noncompliance with quality control criteria.

3.3 Quality Assurance/Quality Control

The overall goal of the project quality assurance (QA) program is to provide a reasonable degree of confidence in project data and results through establishment of a rigorous system of quality and performance checks on data collection, analysis, and reporting activities, as well as to provide for appropriate and timely corrective action to achieve compliance with established performance and quality criteria. This section presents data quality objectives (DQOs) and the quality control (QC) procedures developed to meet these DQOs, sample handling and chain-of-custody procedures, laboratory control samples, performance and system audits, corrective actions, and data validation.

3.3.1 Data Quality Objectives

Results from these investigation activities will be used to document and evaluate current environmental conditions at the Site. The sample results must be precise, accurate, representative, complete, and comparable to a degree commensurate with this use.

The QA procedures presented are based on DQOs that were developed in accordance with Ecology guidelines (Ecology 2004). The target control limits (the range within which project data of acceptable quality should fall) for data quality will be laboratory acceptance limits generated according to EPA guidelines (EPA 2005). The target control limits will be used to evaluate data acceptability and are considered to be QC goals for data acceptance.

Precision

Precision is a measure of mutual agreement among individual measurements of the same property under prescribed conditions. Precision is best expressed in terms of the standard deviation or relative percent difference (RPD). QA/QC sample types that test precision include field and laboratory duplicates and matrix or blank spike duplicates. The estimate of precision of duplicate measurements will be expressed as RPD, which is calculated:

$$RPD = \left| \frac{D_1 - D_2}{(D_1 + D_2)/2} \right| x\,100$$

where:

D1 = first sample value

D2 = second sample value (duplicate).

The RPDs will be routinely calculated and compared with DQO control limits. RPD control limits for field duplicate samples will be 50 percent.

Accuracy

Accuracy is the degree of agreement of a measurement (or an average of measurements of the same property) X, with an accepted reference or true value T, usually expressed as the difference between the two values (X–T), the difference as a percentage of the reference or true value (100 (X–T)/T), or as a ratio (X/T). Accuracy is a measure of the bias in a system and is expressed as the percent recovery of spiked (matrix or surrogate spike) samples:

$$Percent\ Recovery = \frac{(Spiked\ Sample\ Result - Unspiked\ Sample\ Result)}{Amount\ of\ Spike\ Added} x\,100$$

The percent recovery will be routinely calculated and checked against DQO control limits.

Representativeness

Representativeness expresses the degree to which data accurately and precisely represent an actual condition or characteristic of a population. Representativeness can be evaluated using replicate samples, additional sampling locations, and blanks.

Completeness

Completeness is a measure of the proportion of data obtained from a task sampling plan that is determined to be valid. It is calculated as the number of valid data points divided by the total number of data points requested. The QA objective for completeness during this project will be 95 percent. Completeness will be routinely determined and compared to the DQO acceptable percentage.

Comparability

Comparability is an expression of the confidence with which one data set can be compared to another. QA procedures in this document will provide for measurements that are consistent and representative of the media and conditions measured. All sampling procedures and analytical methods used for the investigation sampling activities will be consistent to provide comparability of results for samples and split samples.

3.3.2 Data Evaluation and Reporting

The laboratory data will be validated and tabulated, and included in an Interim Action Completion Report summarizing all data collected and presenting the remaining sediment and soil conditions for the shoreline and Low Area. The data will subsequently be incorporated into the comprehensive data set under development as part of the RI process, and will be used in evaluating the potential need for future cleanup actions in the area. The data will be uploaded into Ecology's Environmental Information Management (EIM) system.

All RI data will be verified and validated to determine the results are acceptable and meet the DQOs described in Section 3.3.1. Prior to submitting a laboratory report, the laboratory will verify that all the data are consistent, correct, and complete, with no errors or omissions.

Validation of the data will be performed by Landau Associates following the guidelines in the appropriate sections of the EPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review (EPA 1999, 2004) and will include evaluations of the following:

- Chain-of-custody records
- Holding times
- Laboratory method blanks
- Surrogate recoveries
- Laboratory matrix spikes and matrix spike duplicates
- Blank spikes/laboratory control samples
- Laboratory duplicates
- Corrective action records
- Completeness
- Overall assessment of data quality.

In the event that a portion of the data is outside the DQO limits or the EPA guidance (EPA 2004, 1999, 2005, 2007), or sample collection and/or documentation practices are deficient, corrective action(s) will be initiated. Corrective will be determined by the Landau Associates data management team in consultation with the Landau Associates project manager, and may include any of the following:

- Rejection of the data and resampling
- Qualification of the data
- Modified field and/or laboratory procedures.

Data qualification arising from data validation activities will be described in the data validation technical memorandum, rather than in individual corrective action reports.

4.0 REFERENCES

Ecology. 2004. Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies. Olympia, WA: Washington State Department of Ecology.

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EPA. 2007. Considerations for Developing A Dosimetry-Based Cumulative Risk Assessment Approach For Mixtures Of Environmental Contaminants (Final Report). U.S. Environmental Protection Agency, Washington DC.

Shannon & Wilson. 2019a. Restoration Plan, Bay Wood Shoreline Interim Cleanup and Restoration, Everett, Washington. Shannon & Wilson, Inc.

Shannon & Wilson. 2019b. Test Pit Findings and Soils Management Plan, Bay Wood Shoreline Restoration, Everett, Washington. Shannon & Wilson, Inc.

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Miles

Data Source: Esri 2012

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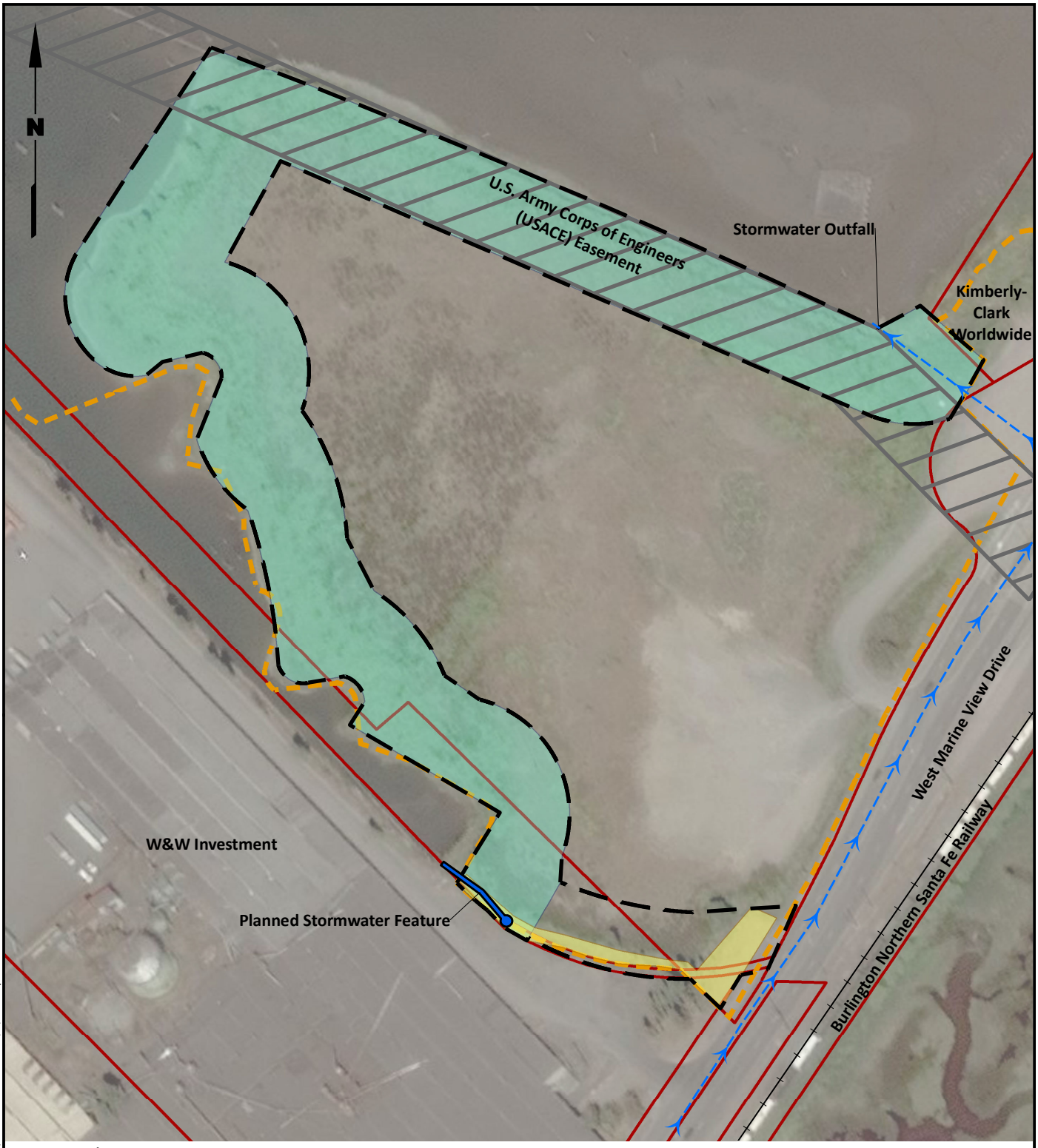
LANDAU ASSOCIATES

Bay Wood Products Compliance Monitoring Plan Everett, Washington	**Vicinity Map**	Figure 1



Legend

- Project Area
- Site Boundary (RI/FS 2018)
- Parcel Boundary
- Low Area
- Shoreline Restoration Area
- City of Everett Stormwater

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 170 340

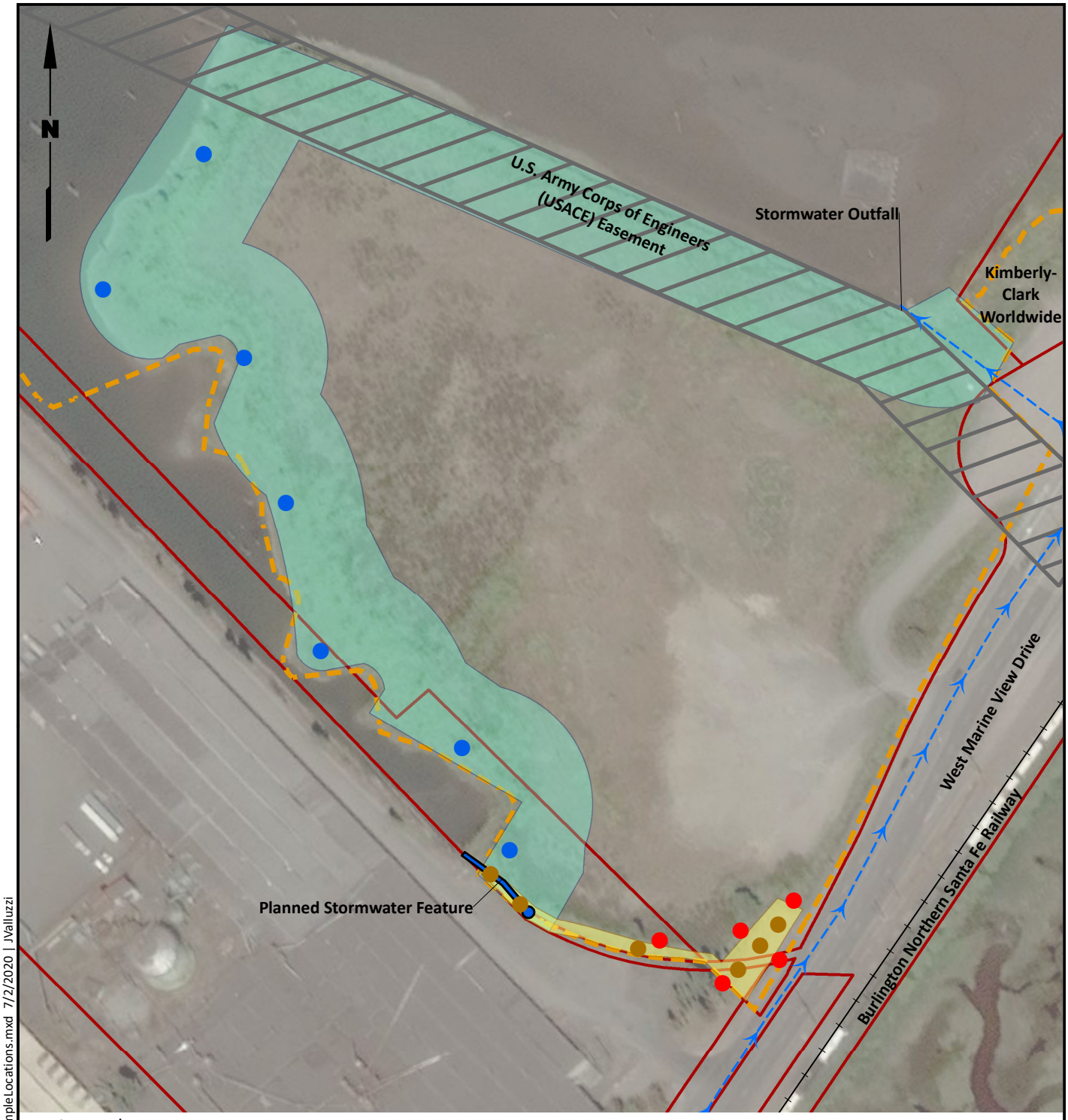
Scale in Feet

Data Source: Shannon & Wilson, Inc.; 2019; Geoengineers, 2018
Base Map Source: ESRI World Imagery, 2020

G:\Projects\147\053\010\013\CMP\F02 SitePlan.mxd 7/2/2020 | JValluzzi

LANDAU ASSOCIATES

Bay Wood Products Compliance Monitoring Plan Everett, Washington	**Site Plan**	Figure 2



Legend

- Shoreline Restoration Compliance Sample Location
- Low Area Excavation Compliance Sample Location (Base)
- Low Area Excavation Compliance Sample Location (Sidewall)
- City of Everett Stormwater
- Low Area
- Shoreline Restoration Area
- Site Boundary (RI/FS 2018)
- Parcel Boundary

Data Source: Shannon & Wilson, Inc.; 2019; Geoengineers, 2018
Base Map Source: ESRI World Imagery, 2020

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 170 340
Scale in Feet

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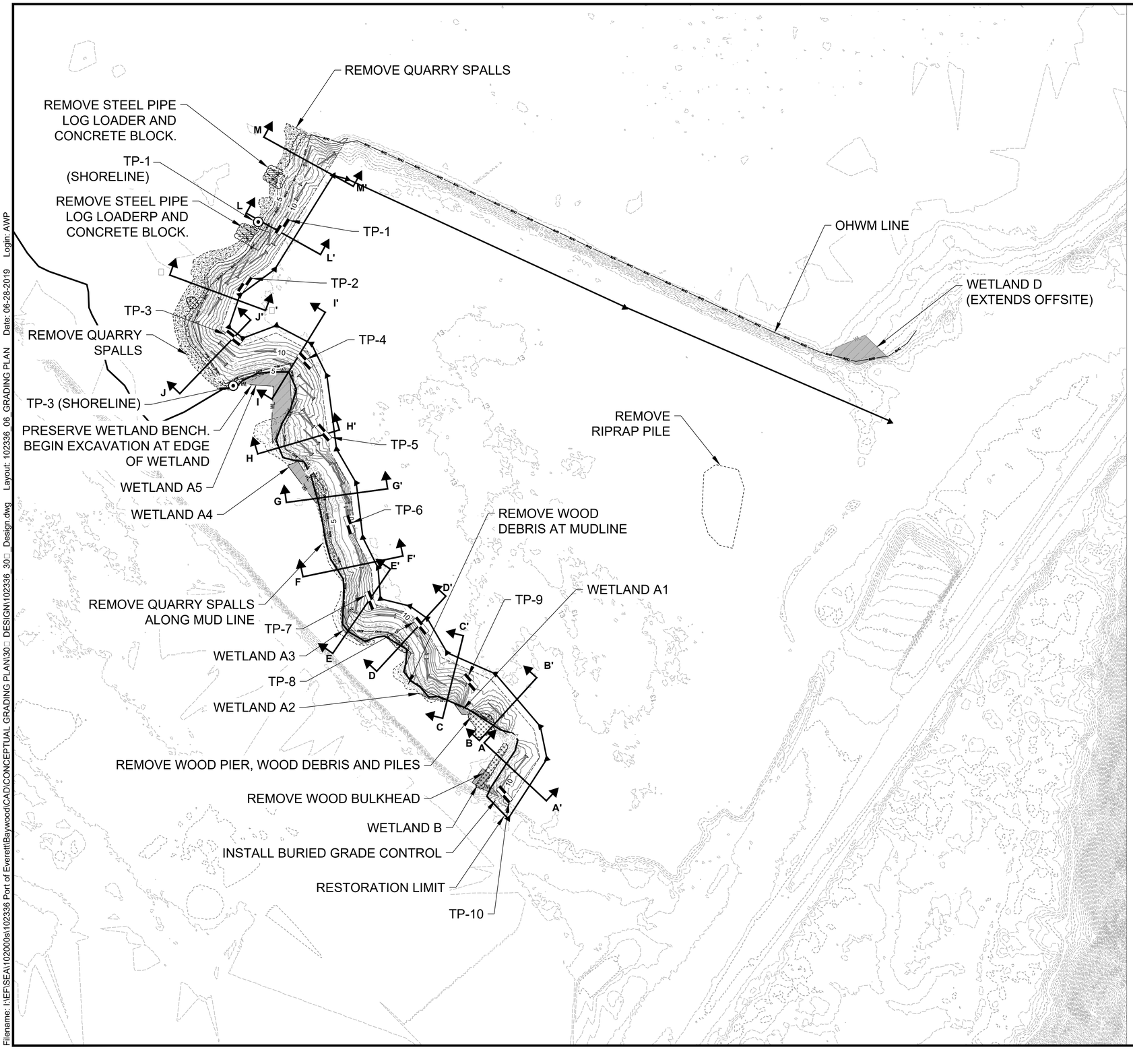
LANDAU ASSOCIATES

Bay Wood Products Compliance Monitoring Plan Everett, Washington	**Sample Locations**	Figure 3

APPENDIX A

March 2020 Test Pit Sampling Locations and Analytical Results



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0 75 150

Scale in Feet

NOTES

1. GRADE SHORELINE AREAS PER FINISHED CONTOURS PLUS 3 FEET OF OVEREXCAVATION, SEE SHEET13.

LEGEND

- MINOR DESIGN CONTOUR (1')
- MAJOR DESIGN CONTOUR (5')
- EXISTING MINOR CONTOUR (1')
- EXISTING MAJOR CONTOUR (5')
- GRADING LIMITS
- DEVELOPMENT BOUNDARY
- EXISTING EXTREME TIDE (8.6')
- EXISTING MHHL (5.4')
- OHWM LINE
- RESTORATION LIMIT
- MATERIAL REMOVAL OUTLINE
- WETLANDS
- QUARRY SPALL REMOVAL (MACHINE)
- QUARRY SPALL REMOVAL (SPECIAL HANDLING)
- MARINE WOOD DEBRIS REMOVAL (SPECIAL HANDLING)
- MARINE WOOD & STEEL STRUCTURE REMOVAL (MACHINE)
- LARGE WOODY DEBRIS (LWD)
- TP-1 — TEST PIT, APPROXIMATE LOCATION
- TP-1 (SHORELINE) — GRAB SAMPLE, APPROXIMATE LOCATION

TITLE: BAYWOOD SITE 30% DESIGN

CLIENT: PORT OF EVERETT

S & W JOB NUMBER: 102336-009

BY	DATE	REVISIONS
AWP	4/19/2019	30% DRAFT
AWP	06/07/2019	

30% DESIGN GRADING PLAN

DAVID R. CLINE — STATE OF WASHINGTON — 9326 — REGISTERED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
400 North 34th Street, Suite 100
Seattle, Washington 98103
P.O. Box 300303
(206) 632-8020 FAX: (206) 633-6777

DATE: 06/04/2019
DRAWN: AWP
CHECKED: DRC
JOB NO.: 102336

Fig. 1

This Drawing is Full Size when 22" x 34" or is Half Size when 11" x 17"

Filename: I:\EF\SEA\102000s\102336 Port of Everett\Baywood\CAD\CONCEPTUAL GRADING PLAN\30□ DESIGN\102336_30□ Design.dwg Layout: 102336_06_GRADING PLAN Date: 06-28-2019 Login: AWP

Table A-1
TP-9 and TP-10 Soil Analytical Results
Port of Everett Baywood

Analyte	RI/FS Soil Screening Level (a)	Field Sample ID, Laboratory SDG, Sample Date: TP-9-20 (4) EV20030118 3/19/2020	Field Sample ID, Laboratory SDG, Sample Date: TP-10-20 (0-6) EV20030118 3/19/2020
Total Petroleum Hydrocarbons (mg/kg; NWTPH-Dx)			
Diesel-Range Organics	2,000	**50**	25 U
Oil-Range Organics	2,000	**180**	**82**
Total Metals (mg/kg; SW-846 6020)			
Arsenic	NL	**16**	**5.5**
Cadmium	NL	0.10 U	0.10 U
Copper	NL	**74**	**20**
Nickel	NL	**37**	**37**
Selenium	NL	1.0 U	1.0 U
Silver	NL	**0.11**	0.10 U
Thallium	NL	1.0 U	0.37 U
Polychlorinated Biphenyls (mg/kg; SW-846 8082A)			
Aroclor 1016	NL	0.10 U	0.10 U
Aroclor 1221	NL	0.10 U	0.10 U
Aroclor 1232	NL	0.10 U	0.10 U
Aroclor 1242	NL	0.10 U	0.10 U
Aroclor 1248	NL	0.10 U	0.10 U
Aroclor 1254	NL	0.10 U	0.10 U
Aroclor 1260	NL	0.10 U	0.10 U
Aroclor 1268	NL	0.10 U	0.10 U
Total PCBs	NL	0.10 U	0.10 U
Polycyclic Aromatic Hydrocarbons (mg/kg; SW-846 8270D SIM)			
1-Methylnaphthalene	NL	0.020 U	0.020 U
2-Methylnaphthalene	NL	0.020 U	0.020 U
Acenaphthene	NL	0.020 U	0.020 U
Acenaphthylene	NL	0.020 U	**0.022**
Anthracene	NL	0.020 U	0.020 U
Benzo(a)anthracene	NL	0.020 U	**0.051**
Benzo(a)pyrene	NL	**0.022**	**0.043**
Benzo(b)fluoranthene	NL	**0.053**	**0.140**
Benzo(g,h,i)perylene	NL	**0.024**	**0.074**
Benzo(k)fluoranthene	NL	0.020 U	**0.031**
Chrysene	NL	**0.022**	**0.073**
Dibenzo(a,h)anthracene	NL	0.020 U	**0.020**
Fluoranthene	NL	**0.024**	**0.058**
Fluorene	NL	0.020 U	0.020 U
Indeno(1,2,3-cd)pyrene	NL	0.020 U	**0.057**
Naphthalene	0.25	0.020 U	0.020 U
Phenanthrene	NL	0.020 U	**0.033**
Pyrene	NL	**0.021**	**0.047**
cPAH TEQ (ND = 0)	0.14	**0.028**	**0.074**
Dioxins/Furans (ng/kg; SW-846 1613B)			
2,3,7,8-TCDD	NL	2.04 U	0.500 U
1,2,3,7,8-PeCDD	NL	5.87 U	2.50 U
1,2,3,4,7,8-HxCDD	NL	8.76 U	**0.971 J**
1,2,3,6,7,8-HxCDD	NL	**105**	1.50 U
1,2,3,7,8,9-HxCDD	NL	**24.5**	0.919 U
1,2,3,4,6,7,8-HpCDD	NL	**1240**	**30.2**
OCDD	NL	**7920**	**230**
2,3,7,8-TCDF	NL	3.82 U	**1.31**
1,2,3,7,8-PeCDF	NL	**4.15 J**	2.50 U
2,3,4,7,8-PeCDF	NL	**10.8**	2.50 U

Table A-1
TP-9 and TP-10 Soil Analytical Results
Port of Everett Baywood

Analyte	RI/FS Soil Screening Level (a)	Field Sample ID, Laboratory SDG, Sample Date	
		TP-9-20 (4) EV20030118 3/19/2020	TP-10-20 (0-6) EV20030118 3/19/2020
1,2,3,4,7,8-HxCDF	NL	**11.6**	0.831 U
1,2,3,6,7,8-HxCDF	NL	**8.25**	0.398 U
1,2,3,7,8,9-HxCDF	NL	3.75 U	2.50 U
2,3,4,6,7,8-HxCDF	NL	**16.5**	0.585 U
1,2,3,4,6,7,8-HpCDF	NL	**491**	**9.86**
1,2,3,4,7,8,9-HpCDF	NL	**15.3**	**1.16 J**
OCDF	NL	**952**	**82.2**
Total Tetra-Dioxins	NL	**6.31**	**12.8**
Total Penta-Dioxins	NL	**28.2**	**18.2**
Total Hexa-Dioxins	NL	**460**	**37.1**
Total Hepta-Dioxins	NL	**2220**	**53.7**
Total Tetra-Furans	NL	**9.08**	**12.0**
Total Penta-Furans	NL	**143**	**2.29 J**
Total Hexa-Furans	NL	**599**	**5.57**
Total Hepta-Furans	NL	**1480**	**35.5**
Total TEQ (ND = DL/2)	13 (b)	**42.4**	**1.41**

Notes:

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
Bold text indicates detected analyte.
Green shading indicates detected analyte exceeds applicable cleanup level.

(a) Vadose zone and saturated zones soil screening levels presented in draft RI/FS Table 4, Preliminary Soil Cleanup Levels, Geoengineers. June 22, 2018.
(b) Dioxin/furan TEQ soil screening level in the low area is based on the MTCA Method B human health health direct contact pathway (13 ng/kg); the Sitewide for dioxin/furan TEQ based on background concentrations is 5.2 ng/kg.

Abbreviations/Acronyms:

cPAH = carcinogenic polycyclic aromatic hydrocarbon
DL = detection limit
ID = Identification
mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
ND = nondetect
NL = not listed
NWTPH = Northwest Total Petroleum Hydrocarbon
PCBs = polychorinated biphenyls
RI/FS = remedial investigation/feasibility study
SDG = sample delivery group
SIM = selected ion monitoring
TEQ = toxicity equivalency quotient

Table A-2
S-W Test Pit Soil Analytical Results
Port of Everett Baywood

Analyte	RI/FS Soil Screening Level (a)	Field Sample ID, Laboratory SDG, Sample Date			
		TP-2-20 (TOE) EV20030117 3/19/2020	TP-5-20 EV20030117 3/19/2020	TP-6-20 (3-4) EV20030117 3/19/2020	TP-7-20 (3-6) EV20030117 3/19/2020
Total Petroleum Hydrocarbons (mg/kg; NWTPH-Dx)					
Diesel-Range Organics	2,000	180 U	**200**	**81**	**65**
Oil-Range Organics	2,000	**1,100**	**710**	**2,000**	**1,100**
Total Metals (mg/kg; SW-846 6020)					
Arsenic	NL	**1.8**	**4.1**	**4.6**	**4.2**
Cadmium	NL	0.10 U	**0.14**	**0.26**	**0.13**
Copper	NL	**12**	**55**	**37**	**60**
Nickel	NL	**6.7**	**15**	**22**	**26**
Selenium	NL	1.0 U	1.0 U	1.0 U	1.0 U
Silver	NL	0.10 U	0.10 U	0.10 U	0.10 U
Thallium	NL	0.89 U	0.82 U	0.80 U	0.91 U
Polycyclic Aromatic Hydrocarbons (mg/kg; SW-846 8270D SIM)					
1-Methylnaphthalene	NL	0.020 U	0.020 U	**0.027**	0.020 U
2-Methylnaphthalene	NL	0.020 U	0.020 U	**0.022**	0.020 U
Acenaphthene	NL	**0.028**	0.020 U	**0.043**	0.020 U
Acenaphthylene	NL	0.020 U	0.020 U	0.020 U	0.020 U
Anthracene	NL	**0.028**	0.020 U	0.020 U	0.020 U
Benzo(a)anthracene	NL	**0.078**	0.020 U	**0.061**	0.020 U
Benzo(a)pyrene	NL	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(b)fluoranthene	NL	**0.031**	0.020 U	**0.036**	0.020 U
Benzo(g,h,i)perylene	NL	**0.11**	0.020 U	**0.079**	**0.022**
Benzo(k)fluoranthene	NL	0.020 U	0.020 U	0.020 U	0.020 U
Chrysene	NL	**0.063**	0.020 U	**0.028**	0.020 U
Dibenzo(a,h)anthracene	NL	0.020 U	0.020 U	0.020 U	0.020 U
Fluoranthene	NL	**0.200**	0.020 U	**0.180**	0.020 U
Fluorene	NL	**0.038**	0.020 U	**0.061**	0.020 U
Indeno(1,2,3-cd)pyrene	NL	**0.026**	0.020 U	**0.034**	0.020 U
Naphthalene	0.25	0.020 U	0.020 U	0.020 U	0.020 U
Phenanthrene	NL	**0.075**	0.020 U	**0.130**	0.020 U
Pyrene	NL	**0.120**	0.020 U	**0.150**	0.020 U
cPAH TEQ (ND = 0)	0.14	**0.014**	0.020 U	**0.013**	0.020 U

Notes:

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

Bold text indicates detected analyte.

Green shading indicates detected analyte exceeds applicable cleanup level.

(a) Vadose zone and saturated zones soil screening levels presented in draft RI/FS Table 4, Preliminary Soil Cleanup Levels, Geoengineers. June 22, 2018.

Abbreviations/Acronyms:

cPAH = carcinogenic polycyclic aromatic hydrocarbon
ID = Identification
mg/kg = milligrams per kilogram
ND = nondetect
NL = not listed
NWTPH = Northwest Total Petroleum Hydrocarbon
RI/FS = remedial investigation/feasibility study
SDG = sample delivery group
SIM = selected ion monitoring
TEQ = toxicity equivalency quotient

APPENDIX C

Bay Wood Redevelopment and Shoreline Cleanup and Restoration Design Criteria Memorandum

SHANNON & WILSON

MEMORANDUM

TO: Port of Everett (Laura Gurley; Erik Gerking, LG; and Elise Gronewald, PE)

FROM: Shannon & Wilson (Katie Walter, PWS; Shelby Petro, PWS; and Dave Cline, PE)

DATE: June 20, 2019

PROJECT: Bay Wood Redevelopment and Shoreline Interim Cleanup and Restoration, Everett, Washington

PROJ. #: 102336-006

SUBJECT: Restoration Design Criteria

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1 INTRODUCTION

This memorandum is being provided on behalf of the Port of Everett (Port) to the City of Everett Planning Department (City) and the Washington State Department of Ecology (Ecology) Toxics Cleanup Program to provide design criteria for the proposed shoreline cleanup and restoration at the Bay Wood Property (Property). The proposed restoration is being planned as part of the Puget Sound Initiative environmental cleanup and in conjunction with and to support site redevelopment. The primary goals of the design criteria are to establish the basic parameters of the restoration that is intended to significantly improve ecological function of the shoreline as part of an interim remedial action with Ecology, and to fulfill the requirements of a critical area buffer reduction request to the City to support the future upland development of the Property. The Port of Everett is working with Ecology under a Model Toxics Control Act (MTCA) Agreed Order (No. 5490) to clean up and restore this Property as part of the State of Washington's Puget Sound Initiative.

In response to this technical memorandum, the Port is seeking written correspondence from the City and Ecology to confirm that the City, Ecology, and the Port agree that the design criteria described in this technical memorandum will govern the final design and performance of the restoration. This is with the express understanding that doing so will suffice in allowing for early City approval of a critical area buffer reduction to 50 feet in support of State Environmental Policy Act and Shoreline Management Act permit reviews. This will also suffice in allowing for Ecology's acceptance relative to meeting expectations of the Port's cleanup and restoration goals under the Agreed Order. All restoration work presented herein is anticipated to be a MTCA Interim Cleanup Action.

1.1 Project Location

The Property is located at 200 West Marine View Drive, Everett, Washington (Section 07, Township 29N, Range 05E) (Figure 1). The project area for this Restoration Design Criteria technical memorandum includes the shoreline of parcel no. 29050700100300 and the 50 feet extending upland from the top of bank of the shoreline (Figure 2). Adjacent land uses include tidal mudflats and vacant land owned by Kimberly-Clark Worldwide, Inc. to the north; West Marine View Drive, BNSF Railway railroad tracks, and Maulsby Swamp to the east; Jeld-Wen property to the south; and the Snohomish River to the west (Figure 2).

1.2 Project Description

The Port proposes to implement approximately 1,300 linear feet of shoreline restoration and 2,200 linear feet of buffer enhancement measures along the shoreline at the Property for the purposes described above. The Property shoreline is currently challenged by a low-functioning, publicly inaccessible shoreline that is overgrown with invasive plant species, has scattered industrial debris, has over-steepened shoreline embankment made of quarry spalls and wood debris, dilapidated creosote-treated bulkheads, and other unnatural features.

In general, the restoration work will involve removing invasive plant species, industrial debris, creosote-treated wood structures, and wood waste and sculpting significant portions of the shoreline by excavation and backfilling with habitat-friendly and geotechnically suitable material. It will also involve planting a variety of native plant species, installing large woody debris (LWD), and constructing a trail for public access purposes. Monitoring and maintaining the restoration until it has become established will also be included.

Note, the Property has some limitations that affect the extent of restoration that is possible. To the north, the U.S. Army Corps of Engineers (Corps) holds a 100-foot-wide easement on

the training wall structure that places practical limitations on the extent of work that can be done along the entire length of the northern shoreline area. To the south, the Jeld-Wen MTCA cleanup site boundary extends onto the Property shoreline and will place limits on the extent of the cleanup and restoration work. These limitations are described more thoroughly in the following sections.

This restoration work is expected to be done in conjunction with development of the upland portion of the Property and under appropriate administrative processes with Ecology, as required. The Port anticipates this restoration work being done under all applicable local, state, and federal permits and as a MTCA interim cleanup action.

1.3 Previous Land Use

The Property was the site of a sawmill and log processing yard from the 1940s through the 1990s. In the late 1990s, the site was significantly altered to rehabilitate it by the removal of bark, rock, and wood chips; the construction of a dike; and backfilling the upland areas with sand. All structures on the Property were removed. The Property has remained vacant since 1995 (GeoEngineers, 2018). Additional upland cleanup occurred between 2012 and 2013.

1.4 Model Toxics Control Act (MTCA) Cleanup Project Limits

The shoreline restoration area is located within the Bay Wood MTCA cleanup site boundaries (Figure 3). Within the narrow inlet that separates the Property from the Jeld-Wen-owned property to the south, Ecology has identified sediment contamination. In a letter from Ecology dated June 22, 2016, to Jeld-Wen, Ecology confirmed the sediment contamination located within the inlet is attributed to releases from the Jeld-Wen cleanup site (Kallus, 2016). The boundary of the Jeld-Wen contamination extends into the Port-owned Bay Wood property, including the shoreline restoration area being described as part of this document. The contaminated sediments on Port-owned property will be addressed as part of the future Jeld-Wen cleanup. While the intent of the shoreline restoration is to restore the Port-owned property that is only within the Bay Wood cleanup site, not within the Jeld-Wen cleanup site, the Port and Ecology are currently evaluating the possible removal of physical anthropogenic debris, specifically quarry spalls and wood, that is located on the Bay Wood shoreline but is within the Jeld-Wen cleanup site. The extent of and methods for removal of this debris as part of the Bay Wood restoration is under consideration and will be determined in close coordination with Ecology during the engineering design process. The added complexities of removal and handling of the debris

contaminated by Jeld-Wen-contaminated sediment and the associated administrative and legal processes and project cost implications, in addition to other factors, will be considered as part of this decision-making process.

1.5 Existing Conditions

Existing conditions at the project site were characterized based on site visits in January 2019 to delineate and characterize aquatic and upland habitats (Shannon & Wilson, 2019) and during a site walk with the Port (L. Gurley, E. Gerking, and E. Gronewald), the City (K. Stewart and S. Ingalsbe), Ecology (C. Abercrombie and S. Meng), and Shannon & Wilson (S. Petro, A. Summe, and D. Cline) on March 22, 2019.

The Property is located along the lower Snohomish River channel in a reach characterized by hardened banks, bulkheads, docks, pilings, industrialized areas, intensive water uses, and highly modified or artificially created habitats (City, 2016). The Property is vacant and vegetated with invasive species around the edges with sparsely vegetated areas and unvegetated, disturbed, sandy soils in the central portion of the upland area.

The project area consists of a degraded shoreline and disturbed upland buffer. Multiple defunct marine industrial structures, including mooring piles, piers, and bulkheads, are found along the entire site shoreline. Debris found along all aspects of the shoreline includes riprap, asphalt, concrete, steel pipe log skids, creosote timber piles, wire cables, trash, tires, wood debris and waste ranging from dimensional lumber to sawdust, and other miscellaneous anthropogenic materials. Mud and sand flats extend waterward of the project area into the Snohomish River estuary.

The northern shoreline is a riprap and pile "training wall" maintained by the Corps in a 100-foot-wide easement (Figure 3). The mudflats north of this shoreline are part of a future and final MTCA cleanup for the site (GeoEngineers, 2018). The western shoreline consists of slopes that are eroded by tides and wave action, exposing fill material and debris left over from prior land uses at the site. The southern shoreline follows an inlet channel and is relatively protected from wind and wave erosion. This shoreline includes areas of gentle slopes with vegetated wetlands in the upper tidal reaches in addition to areas with steep, unvegetated slopes. LWD is present on portions of the shoreline along the upper banks. Along this inlet channel are freshwater seeps that are exposed during low tide. At the terminus of the channel, a drainage channel and wetland lie behind failing bulkhead. The mud substrate of the inlet channel is contaminated and is part of a future MTCA cleanup on and adjacent to the Jeld-Wen property (GeoEngineers, 2018).

Three wetlands, Wetlands A, B, and D, were delineated within the project area on low-aspect slopes of the upper reaches of the shoreline (Figure 3; Shannon & Wilson, 2019). Wetlands A and B are within the proposed shoreline restoration area, and Wetland D is mostly offsite on the adjacent Kimberly-Clark property. Another area was previously identified as Wetland C; however, after further investigation and data gathering, its history indicates that the area is a stormwater drainage channel and a known location of illicit stormwater discharge from the neighboring property (SLR, 2018). Therefore, this area was not identified as a regulated wetland. In addition, it is outside of the restoration project area and therefore not discussed further in this memorandum (Shannon & Wilson, 2019). Exhibit 1-1 describes the wetland classifications, categorization, and regulatory buffer widths. Within the project area, the Snohomish River is designated as a Shoreline of the State and a Category I river (Everett Municipal Code [EMC] 19.33D.480). The river is afforded a 100-foot buffer from the top of the upper bank (EMC 19.33D.490). Regulatory buffers are further described in Section 2.

Exhibit 1-1: Wetlands Delineated in the Project Area

Wetland Name	Size (square feet)	USFWS Classification[a]	HGM Classification[b]	Ecology Category[c]	City of Everett Category[d]	Buffer Width (feet)[e]
A	4,390	E2EM1	Estuarine	II	III	50
B	501	E2EM1	Estuarine	II	III	50
D[f]	--	E2EM1	Estuarine	II	I	100

NOTES:

a. U.S. Fish and Wildlife Service (USFWS) classification is based on Cowardin (Federal Geographic Data Committee, 2013): estuarine intertidal emergent persistent wetland (E2EM1), palustrine emergent saturated wetland (PEMB), and palustrine emergent (PEM).

b. Hydrogeomorphic (HGM) classification is based on Brinson (1993).

c. Wetland categories are based on the Washington State Wetland Rating System for Western Washington, 2014 Update (Hruby, 2014).

d. Wetlands A, B, and D categories are in accordance with EMC 19.33D.440, because they are located within the shoreline management zone.

e. Wetland A, B, and D buffer widths are determined in accordance with EMC 19.33D.450, because they are located within the shoreline management zone.

f. Wetland D extends offsite; therefore, the total wetland size was not calculated and the classifications, categorization, and associated regulatory buffer widths are only estimates based on visual observations and a review of available information.

Wetland A is composed of five small wetland units (A-1 through A-5) along the inlet channel on the southern shoreline. Wetland A provides minimal functions at the site due to its size, position in the landscape, and site-specific characteristics. Situated just below the ordinary high water mark (OHWM) of the Snohomish River, the wetland is sparsely vegetated in mud substrate. It provides some habitat for aquatic invertebrates and foraging shorebirds but does not provide shade, litter, and woody debris recruitment or refugia for

fish or wildlife species. Furthermore, Shannon & Wilson field staff observed anthropogenic debris such as asphalt, fill material, concrete, rubber, and metal debris in portions of the wetland. The wetland provides some protection from tidal and wave erosion due to its vegetated structure; however, because the vegetation is emergent and not woody in structure, the wetland does not provide a high level of erosion control functions and could be lost during an erosive storm event (Shannon & Wilson, 2019). We note that the wetland in part is protected by the Corps training structure that causes sediment deposition in the channel. Unit A-5 within Wetland A has greater native vegetation cover, structure, and diversity and is located in a pocket of the shoreline, which provides refuge from wind and waves (Figure 3). This wetland unit provides greater habitat and erosion control functions than the other wetland units on site.

Wetland B provides minimal functions. Situated behind a decaying wooden bulkhead at the terminus of the inlet channel, Wetland B is inundated during high tides and captures sediments in depressions as the tide recedes. The wetland is sparsely vegetated with emergent vegetation and provides some habitat for foraging shorebirds but does not provide shade, litter, and woody debris recruitment or refugia for fish or wildlife species. Furthermore, it is heavily disturbed and anthropogenic debris such as concrete, wood, metal posts, and rubber and metal debris was observed in portions of the wetland. Because the wetland is confined behind the wooden bulkhead, it provides little erosion control from tides and wave action and portions of the wetland were observed to be eroding into the inlet channel between failing sections of the bulkhead (Shannon & Wilson, 2019).

Wetland D is an estuarine wetland located north of the project area and Corps training wall on a low-aspect slope. The wetland is densely vegetated along the lower and intermediate slope with emergent vegetation that provides erosion control, water filtration, and sediment stabilization and deposition functions in addition to habitat for invertebrates, foraging shorebirds, and upland wildlife species. The wetland areas at the top of the slope are vegetated with shrubs that provide shade, litter, woody debris recruitment, refugia, and food production for local wildlife species (Shannon & Wilson, 2019). This wetland will serve as a reference site for designing a shoreline restoration vegetation structure and a native species planting palate.

The upland shoreline is disturbed from previous land uses and excavation and fill activities. The area is currently vegetated with predominantly invasive species, including scotch broom (*Cytisus scoparius*) and Himalayan blackberry (*Rubus armeniacus*). A few native trees are present along the shoreline, including red alder (*Alnus rubra*) and Pacific crabapple (*Malus fusca*). The remainder of the upland portion of the Property consists of sparsely

vegetated areas and unvegetated, disturbed, sandy soils. The uplands provide marginal habitat for wildlife species, including small mammals, passerines, and waterfowl, in addition to foraging habitat for birds of prey such as hawks (Shannon & Wilson, 2019).

The potential for providing habitat is limited by landscape restrictions including being cut off from Maulsby Swamp by West Marine View Drive and BNSF railroad tracks and environmental stressors, including surrounding industrial land uses and boat traffic in the river. In addition, the surrounding intertidal mudflats are part of proposed cleanup actions (GeoEngineers, 2018).

2 BUFFER REDUCTION

The Port is requesting a critical area (i.e., wetland and stream) buffer reduction from the City, to be vested under the existing Shoreline code (EMC 19.33D) to support redevelopment of the upland portion of the Property. Under this code, the largest critical area buffer within the restoration area on site is 100 feet, extending upland from the top of the shoreline bank. The Port is requesting a buffer reduction of 50 feet (or 50% of the standard 100-foot buffer) to a 50-foot critical area buffer for Wetland D and the Snohomish River. Wetlands A and B are by code already afforded a 50-foot buffer and therefore not included in this buffer reduction request. The following sections describe the relevant City code, Planning Director Interpretations (PDIs), and the development objectives that drive this buffer reduction request.

2.1 Development Objectives

The Port is currently reviewing possible commercial and industrial uses for site redevelopment by others. The Port is requesting the critical area buffer reduction on behalf of the developer to maximize developable land on the Property.

Within the City's Shoreline Master Program (City, 2016), the Shoreline Public Access Plan (SPAP) describes the City's goal to provide public access to the shoreline along the Snohomish River. At the Property, the SPAP proposes a spur trail along the north shore within the Corps training wall easement. At a minimum, the proposed project trail will meet the SPAP concept with a trail that will connect to a trail along West Marine View Drive and include a lookout at the end of the spur with views to the north and west of Mount Baker and the Snohomish River.

2.2 Code Review

Wetlands and streams are regulated by the City through the critical areas ordinance and Shoreline Master Program (City, 2016). The shoreline management zone includes areas within 200 feet of the OHWM of waters of the state, including the section of the Snohomish River within the project area and wetlands contiguous with the shoreline. In the City's Shoreline Master Program, the project area below the top of bank is designated as an aquatic conservancy zone, and the area landward of the top of bank is designated as urban industrial zone (City, 2016). Critical areas (e.g., wetlands and streams) within the 200-foot shoreline management zone are subject to the guidelines outlined in the City's shoreline overlay district zoning code (EMC 19.33D). Wetlands A, B, and D are contiguous with the shoreline and are within shoreline jurisdiction and are therefore rated under the Everett shoreline code. Critical areas outside of the 200-foot zone are subject to the critical areas chapter of the zoning code (EMC 19.37). There are no critical areas on this site that are outside of the 200-foot zone.

The following sections of EMC and PDIs are relevant to the project site, proposed shoreline cleanup and restoration, and buffer reduction request:

EMC 19.33D.440 – Wetland delineation and rating
Wetlands A and B are rated as Category III, because they are not associated with a documented habitat of primary association, are not high-quality native wetlands, are less than 1 acre in size, and although they are estuarine wetlands, their functions are minimal and can be replaced through shoreline restoration efforts focused on functional uplift. Wetland D is rated as Category I, because it is a relatively high-quality estuarine wetland with functions that would be harder to replace. Wetland D is located within a future MTCA cleanup area that is under an Agreed Order.

EMC 19.33D.450 – Standard wetland buffer width requirements
Category I wetlands are afforded a 100-foot buffer, and Category III wetlands are afforded a 50-foot buffer (Figure 3).

EMC 19.33D.480 – Stream rating
The Snohomish River is used by salmonids and is listed in the City's Shoreline Master Program (City, 2016) and is therefore a Category I river.

19.33D.490 – Standard Stream Buffer Requirements
The critical area buffer is measured from the top of bank (Figure 3). The Snohomish River is afforded a 100-foot buffer at the project site. Per code, the buffer may be less than 100 feet

with the incorporation of public access. For a standard stream buffer width reduction, the City's Planning Director may reduce the standard buffer when there has been "substantial legal alteration" of the buffer. As described in Section 1, the project area was previously significantly disturbed, and vegetation was eliminated. The planning director may allow a buffer reduction (rather than buffer averaging) when the proposal includes a buffer enhancement plan that improves the functional values of the buffer and stream. Section 4 describes design criteria for buffer enhancement at the project site. Buffers are not allowed to be reduced more than 50% of the standard buffer; therefore, the Port requests a buffer reduction from 100 feet to 50 feet. This is further described in PDI 01-005.

Planning Director's Interpretation (PDI) 01-005

PDI 01-005 provides clarification on the interpretation of code and outlines the parameters under which the City allows for buffer reductions. The prior alterations at the project site meet the legal alteration criteria for "The activity predates the City's Environmental Sensitive Areas Ordinance (EMC 1/31/91) (and has not been substantially revegetated with native vegetation)." In addition, the buffers at the project site are substantially altered from past uses, grading, and placement of fill material such that the buffer is vegetated with primarily invasive species (Himalayan blackberry and scotch broom) covering more than 75% of the buffer area. Clearing of the buffer was part of an authorized action and revegetation with native species has not occurred.

The enhancement plan that accompanies the buffer reduction request must increase the functions and values of the wetland and/or stream and include a monitoring, maintenance, and assurance device. Section 4 outlines the proposed design criteria for buffer restoration and enhancement.

3 GOALS AND OBJECTIVES

To meet the requirements of cleanup and to satisfy the buffer reduction request, the Port proposes to clean up and restore the shoreline at the project site and enhance the buffer to improve the ecological functions at the site and provide public access. The actions described in the design criteria in Section 4 support the following goals and objectives. Goals and objectives are based on the City's Shoreline Master Program (City, 2016), the recovery actions for the Snohomish Estuary found in the Snohomish River Basin Salmon Conservation Plan (Snohomish Basin Salmon Recovery Forum, 2005), and the Snohomish Estuary Wetland Integration Plan (SEWIP; City, 1997).

While not an explicit requirement, the Port is participating in the Puget Sound Partnership (PSP) action agenda through its local integrating organization (Snohomish-Stillaguamish; Local Integrating Organization [LIO]), and as part of this shoreline cleanup and restoration, the Port would like to draw the connection of the importance of this work to the LIO Ecosystem Recovery Plan (LIO, 2017). This proposed work addresses several of the priority ecosystem components identified in the recovery plan, including removal of shoreline armoring/nearshore restoration, improving chinook salmon habitat, good governance, cultural well-being, sense of place, outdoor activity, and sound stewardship.

3.1 Goal 1 – Shoreline Cleanup

Clean up the shoreline by removing anthropogenic debris to restore the shoreline to a more natural state. See preliminary plans and sections, Sheets 2 and 3 (Appendix A).

Objective 1.1: Remove bulkheads and replace with soft shore stabilization measures.

Objective 1.2: Remove debris, including dimensional lumber and wood chips, log skids, riprap rock (quarry spalls), asphalt, concrete, and trash to the extent feasible.

3.2 Goal 2 – Shoreline Restoration

Restore the degraded shoreline habitat to improve habitat for fish and wildlife species, specifically aquatic habitat to support juvenile salmonids using the Snohomish River estuary. See preliminary plans (Appendix A).

Objective 2.1: Restore shoreline grades to a gradual slope that can support native intertidal and riparian vegetation on the west- and south-facing shorelines. The north-facing shoreline will not be graded.

Objective 2.2: Install LWD to stabilize the slope and provide habitat.

Objective 2.2: Restore and expand estuarine wetlands along the shoreline to create saltmarsh habitat.

3.3 Goal 3 – Buffer Enhancement

Establish native riparian vegetation community along the shoreline that includes long-term sources of LWD to support productive shoreline habitat. See preliminary plans and sections, Sheets 2 through 4 (Appendix A).

Objective 3.1: Reestablish native riparian plant communities along the shoreline.

Objective 3.2: Reintroduce LWD through plantings and wood placement.

3.4 Goal 4 – Public Access

Create public access/use opportunities consistent with the City of Everett's Shoreline Master Plan Public Access Plan (2016).

Objective 4.1: Integrate trails and amenities for public access into shoreline restoration actions, as appropriate considering development requirements, safety considerations, availability of space, restoration goals, existing easements, etc.

4 PROPOSED RESTORATION ACTIONS

The Port proposes to enhance and restore the western and southern shorelines and enhance the upland buffer of the entire site to meet cleanup requirements and to support the buffer reduction request. The following sections describe the design criteria for each proposed action. All restoration actions proposed will be performed by land-based equipment.

4.1 Shoreline Cleanup

p-,Anthropomorphic debris within the restoration area will be removed to the extent feasible. Debris includes such things as asphalt, concrete, steel pipe log skids, wire cables, and trash. The bulkhead at the end of the inlet channel will be removed and soft shore stabilization measures implemented. To the extent feasible, and as agreed upon by the Port and Ecology during final design, debris such as dimensional lumber and wood chips, log skids, riprap rock (quarry spalls), asphalt, concrete, and trash will be removed from the western and southern shorelines.

A portion of the southern shoreline adjacent to the Jeld-Wen property will be part of the future cleanup implemented by Jeld-Wen. This area is defined by Ecology and will be delineated as part of the design process. While the intent of the shoreline restoration is to restore the Port-owned property that is only within the Bay Wood cleanup site, not within the Jeld-Wen cleanup site, the Port and Ecology are currently evaluating the possible removal of quarry spalls and dimensional lumber that are located on the Bay Wood shoreline but are within the Jeld-Wen cleanup site. The extent of and methods for removal

of this debris as part of the Bay Wood restoration is under consideration and will be determined in close coordination with Ecology during the engineering design process.

These actions will support Goal 1, Shoreline Cleanup, and Objectives 1.1 and 1.2.

4.2 Shoreline Restoration

The existing western and southern shorelines will be graded back to a more natural slope as much as possible, while also ensuring shoreline stabilization, and planted with native vegetation to create fish and wildlife habitat. This section describes the grading along the shoreline in addition to the net wetland effects anticipated in the restoration efforts.

4.2.1 Shoreline Grading

The northern shoreline within the Corps' easement area will not be graded. The western shoreline immediately adjacent to the Corps' training wall within the easement may have restrictions on what restoration actions can be undertaken. Further coordination with the Corps is underway. Restoration in the easement area will be limited to buffer enhancement, described below. The remaining portion of the western shoreline and the entire southern shoreline will be graded to lay the shore back to an approximate 7:1 slope, with some areas steeper and some flatter. LWD will be installed at the high-tide elevation to provide erosion control, slope stability, and habitat. The slopes will be planted with native vegetation to support intertidal and riparian habitat, described below (Appendix A, Preliminary Plans).

The shoreline restoration design will follow, as feasible and applicable, Washington State Aquatic Habitat Guidelines Program's Marine Shoreline Design Guidelines (Johannessen and others, 2014), the City's Shoreline Master Program (City, 2016), and the SEWIP (City, 1997). Criteria used for the shoreline restoration design may include (but not be limited to):

- Confirmation of the shoreline restoration boundary assumed 50 feet from top of existing bank
- Tidal, storm surge flood, wind, and boat wave conditions
- Stable shore slopes and grades
- Contaminated soils and sediment avoidance boundaries
- Avoidance and minimization of shoreline restoration actions having potential wetland impacts
- Slope excavation backfill material types and specifications

- Debris removal criteria (e.g., types, methods, depths, and best management practices [BMPs] to remove old log skids, concrete, asphalt, wood piles, piers, and bulkheads)
- Placing natural erosion control/stabilization structures (e.g., LWD, buried revetment)
- Vegetation establishment (saltmarsh, backshore, and riparian/upland) at appropriate elevations (this is interconnected with wetland and buffer section, below)
- Erosion protection landward of the southeast bulkhead removal and existing channel

4.2.2 These actions will support Goal 2, Shoreline Restoration, and Objectives 2.1 and 2.2. Net Wetland Effects

The shoreline restoration may temporarily impact existing estuarine wetlands but will , restore existing wetlands after grading the shoreline to a natural slope, and expand wetlands along the shoreline to create intertidal saltmarsh habitat Wetlands A-1 through A-4 will be preserved where feasible but may be temporarily impacted in order to tie the new slope grade into existing topography at wetland locations. Wetland B will be removed during bulkhead removal and slope grading and replaced during slope restoration through native planting. Replaced and enhanced areas of Wetlands A and B will be expanded along the shoreline with native wetland plantings in areas not currently functioning as estuarine wetlands, thus creating a larger area of intertidal saltmarsh habitat (Appendix A, Preliminary Plans).

Impacts to wetlands will be avoided and minimized in accordance with EMC 19.33D.460. For example, where debris is located with wetlands on appropriate slopes, hand removal will be recommended instead of using machines. Where wetlands will be impacted to adjust the shoreline slope, soils will be stockpiled and replaced on the restored shoreline to maintain the native seed bank. In areas with contaminated soils or invasive species, the soil will not be reused.

Impacts to emergent wetlands will be mitigated at a ratio of 1.25:1 (restored areas to impact area) per EMC 19.33D.460. Native wetland vegetation appropriate for tidal elevations will be installed to expand and connect wetlands along the shoreline, creating larger areas of intertidal saltmarsh habitat to support fish and wildlife species. At places along the southern shoreline, the restoration will mirror the existing pocket wetland landscape position and vegetation structure of Wetland A-5. Wetland D will serve as a reference site for the planting pallet of native species to be installed within the shoreline restoration area.

Through implementation of avoidance and minimization measures and mitigation for wetland impacts, the shoreline restoration will be designed such there is no net loss of

wetlands or wetland functions, with an overall functional lift to wetland habitat. The wetland areas will be maintained and monitored in accordance with EMC 19.33D.460 and any other permit conditions from local, state, and federal authorities authorizing the restoration activities.

These actions will support Goal 2, Shoreline Restoration, and Objective 2.3.

4.3 Buffer Enhancement

A 50-foot critical area buffer will be measured from the top of bank of the current shoreline along the entire Bay Wood site from the Jeld-Wen property in the south, along the inlet channel to the west and the Corps training wall to the north, and to the Kimberly-Clark property to the east to establish the shoreline restoration boundary. A portion of this buffer will be excavated as part of the shoreline restoration (described above) and planted with wetland or riparian vegetation. The remaining buffer area uplands will be enhanced by removing the existing invasive species (e.g., Himalayan blackberry and scotch broom), and native species will be installed to create a shrub and forest riparian community. The riparian zone within the restoration area is anticipated to be between 15 to 20 feet in width. Existing native trees will be retained on site to the greatest extent feasible. If the trees must be removed for shoreline restoration, then the trees shall be removed and placed on site as LWD to create habitat features for wildlife species to the extent feasible. Additional LWD will be placed at the upper tidal limits on the edge of the riparian zone to provide shoreline stability and habitat.

Within the Corps' easement on the northern shore, there may be a limited restricted planting zone. The Corps has indicated that appropriate native plants, excluding trees, may be planted for enhancing the buffer within the easement. will be planted with riparian vegetation, including trees, shrubs, and groundcover.

Once established, the riparian vegetation along the entire shoreline will provide shade, litter, and woody debris recruitment and a continuous native riparian corridor along the water for wildlife foraging, refuge, and nesting. While this riparian buffer is narrow, it is a significant ecological functional lift from the current disturbed, degraded, non-native buffer condition. The proposed upland development will manage stormwater on site and will not discharge stormwater to the shoreline buffer.

In accordance with EMC 19.33D.450.C and 19.33D.500.F, the City may require fencing or other structural protection at the edge of the buffer to minimize encroachment into and disturbance of the wetland and/or stream and buffer area. The City may also require

information signs in conspicuous locations on the fence or edge of the buffer to identify the area as an environmentally sensitive area and the importance of maintaining it in a clean and undisturbed condition.

In accordance with EMC 19.33D, maintenance and monitoring shall be required for all projects where wetland mitigation and buffer enhancement is required. Monitoring requirements will be based upon the performance standards defined by the project. Monitoring of the shoreline restoration and buffer enhancement will occur over a 10-year period to protect and support the restored ecological integrity of the site. Monitoring reports will be submitted at the end of years 1, 3, 5, 7, and 10 following installation, or for a duration and frequency as required by state and federal permits issued for the project. Maintenance will occur annually and as specified in annual monitoring reports to address site conditions (i.e., removal of invasive species). Long-term stewardship will be considered to address environmental stressors and urban site impacts.

These actions will support Goal 3, Buffer Enhancement, and Objectives 3.1 and 3.2.

4.4 Public Access

At a minimum, a spur trail will be constructed along the north shore within the Corps' easement to create public access and use opportunities, as proposed in the Shoreline Master Plan Public Access Plan (City, 2016). The trail will be located away from the water edge of the buffer to protect the aquatic habitat from human intrusion and potential degradation. Native vegetation will be installed in the buffer along the trail so as to minimize future trail maintenance (e.g., species will be selected that will not quickly grow into the trail and require trimming). The trail specifications will meet City and Corps (where located within the easement) requirements. A viewpoint will be included at the end of the spur trail. At this viewpoint, native vegetation will be installed within the enhanced buffer to facilitate views of the river (i.e., low-growing vegetation that will not block views).

These actions will support Goal 4, Public Access, and Objective 4.1.

4.5 Contamination Contingency Plan

A Contamination Contingency Plan will be developed prior to implementing the restoration project. This plan will describe what will be done if previously unknown contamination is encountered (e.g., petroleum staining, chemical odors, discolored soil, sheen, etc.). The plan will define the boundaries of known contamination to be avoided, in addition to the known debris planned for removal as part of the restoration so that expectations and boundaries

are clearly established. The plan will provide an assurance that although the restoration schedule may be altered in order to address any unknown contamination issue, the restoration will be completed. The plan will be developed with Ecology and will complement the Interim Action Work Plan and the elements contained within that plan.

4.6 Materials Management Plan

The design will include a materials handling, management, and disposal plan. The plan will include characterization of the types of materials, estimated quantities, site handling, disposal, and reuse recommendations. The project team assumes that shoreline excavations may encounter wood waste and other wood debris, concrete, steel cable, riprap, coarse aggregate fill surface material, topsoil, and vegetation. The materials handling plan will identify which materials may be salvaged and reused on the upland development area (e.g., coarse backfill aggregate) or within the shoreline restoration (e.g., riprap buried as backshore protection or trees placed as LWD).

5 CONCEPTUAL RESTORATION OPTIONS

This section includes descriptions of the conceptual design for various portions of the shoreline restoration project. Typical sections that may be included in the shoreline restoration plan are included in Appendix A, Preliminary Plans. Existing conditions are shown on Sheet 1; an overview of shoreline restoration activities and removal of debris is shown on Sheet 2 (debris locations will be revised following additional survey at the site). Typical sections are shown on Sheet 3 and profiles at various cross sections are shown on Sheets 4 through 8. The 50-foot buffer depicted on the plan sets will be revised after additional survey is processed to more clearly delineate the top of bank. Design criteria outlined in Section 4 would be applied as the conceptual design progresses into final.

5.1 Typical Sections AA through EE – Southern Shoreline

The southern shoreline typical design includes removal and grading of the upper portions of the bank to a stable slope configuration based on other natural and stable shorelines in the area. The shoreline grading will include overexcavation and backfill with clean sands and gravel and native wetland and riparian plantings above the mean tide level. Placement of LWD will occur at either the high or extreme tide debris line elevation or both. The southern shoreline has less exposure to wind fetch, wind, and boat waves; therefore, buried riprap for shoreline stabilization is not included in this area. Opportunities exist along this shoreline to incorporate existing wetland benches into the design (e.g., Wetland A-5). The

wetland benches will be expanded where the shoreline restoration boundary allows, as described in Section 4. Quarry spalls, pilings, concrete, riprap, marine industrial debris, and other anthropogenic debris will be removed from the shoreline areas where accessible by land-based equipment. Excavations will occur primarily outside of the contaminated sediment zones as defined by the approximate restoration boundary between Bay Wood and Jeld-Wen properties, and potentially below that boundary as agreed upon by the Port and Ecology during the design phase. The means, methods, and BMPs will be expanded during the next design phase of the project.

In the southernmost area of the project, Wetland B and a drainage channel lie behind an existing, failing bulkhead. The bulkhead will be removed with grading and erosion protection measures (to be identified during later design phase) installed in the south drainage channel. The channel does not have a typical section design at this time. The design configuration, bulkhead removal, and BMPs of this area will be developed during the next design phase of the project.

5.2 Typical Sections FF and GG – Western Shoreline

The western shoreline typical design includes removal and grading of the upper portions of the bank to a stable slope configuration based on other natural and stable shorelines in the area. The shoreline grading will include overexcavation and backfill with clean sands and gravel and native wetland and riparian plantings above the mean tide level. Placement of LWD will occur at either the high or extreme tide debris line elevations or both. The west shoreline aspect has increased exposure to wind fetch, wind waves, and boat waves. A buried riprap erosion protection trench will be included as a contingency feature to limit and stop shoreline erosion in the higher-energy area, if it were to occur. Quarry spalls, pilings, concrete, riprap, marine industrial debris (e.g., metal log skids), and other anthropogenic debris will be removed from the shoreline areas. Excavations will occur primarily outside of the contaminated sediment zones as defined by the approximate restoration boundary between Bay Wood and Jeld-Wen properties, and potentially below that boundary as agreed upon by the Port and Ecology during the design phase.

6 ASSUMPTIONS AND LIMITATIONS

This technical memorandum is meant to describe the general proposed approach and criteria to be considered and incorporated in the shoreline restoration at the Property. The design may change and evolve based on regulatory agency and tribal input, additional

survey results, soil profile examination and laboratory testing, geotechnical investigations, contaminated soils remediation designs, hydrodynamic modeling, or other constraints yet to be determined.

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Enc. Figure 1 – Vicinity Map
Figure 2 – Site Map
Figure 3 – Existing Conditions
Appendix A – Preliminary Plans

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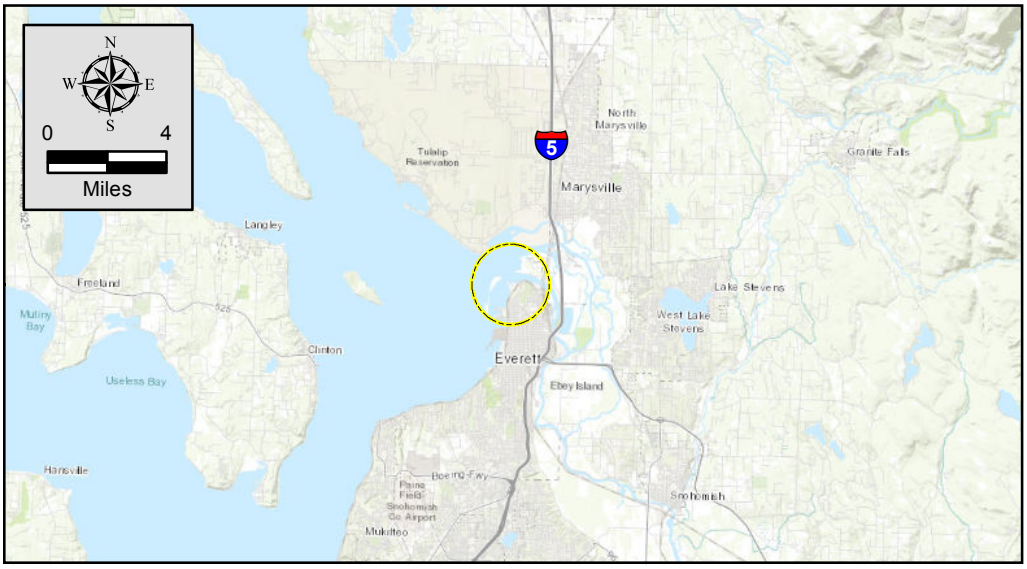

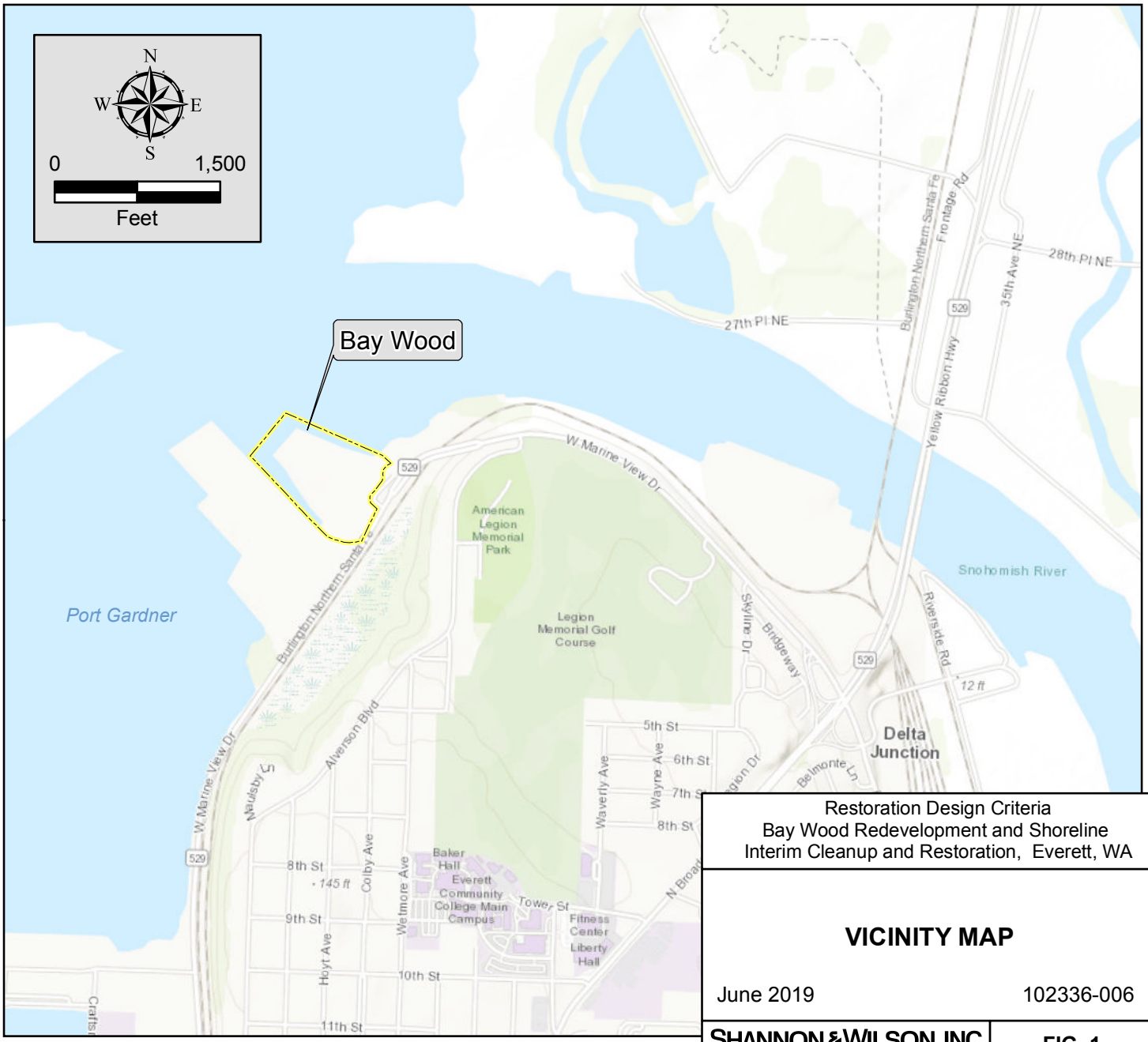

Restoration Design Criteria
Bay Wood Redevelopment and Shoreline
Interim Cleanup and Restoration, Everett, WA

VICINITY MAP

June 2019 102336-006

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1

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LEGEND

- Project Area
- Corps Wall
- Tax Parcels

Restoration Design Criteria
Bay Wood Redevelopment and Shoreline
Interim Cleanup and Restoration, Everett, WA

SITE MAP

June 2019 102336-006

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 2

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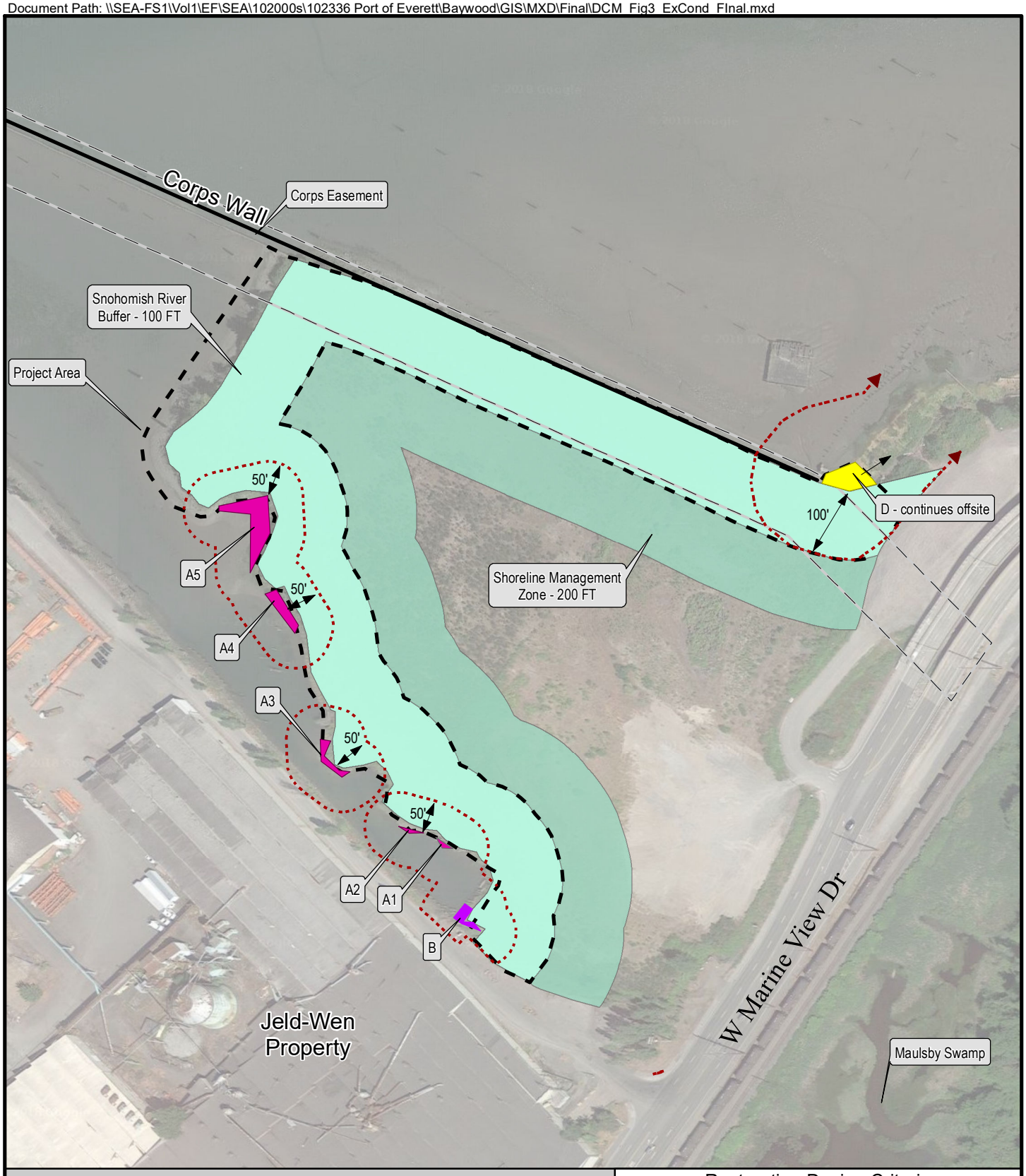

LEGEND

- Wetland A
- Wetland B
- Wetland D
- Snohomish River Buffer (100ft)
- Shoreline Management Zone (200ft)
- Wetland Buffer
- Project Area
- Parcel

N W E S

0 100 200 Feet

Restoration Design Criteria
Bay Wood Redevelopment and Shoreline
Interim Cleanup and Restoration, Everett, WA

EXISTING CONDITIONS

June 2019 102336-006

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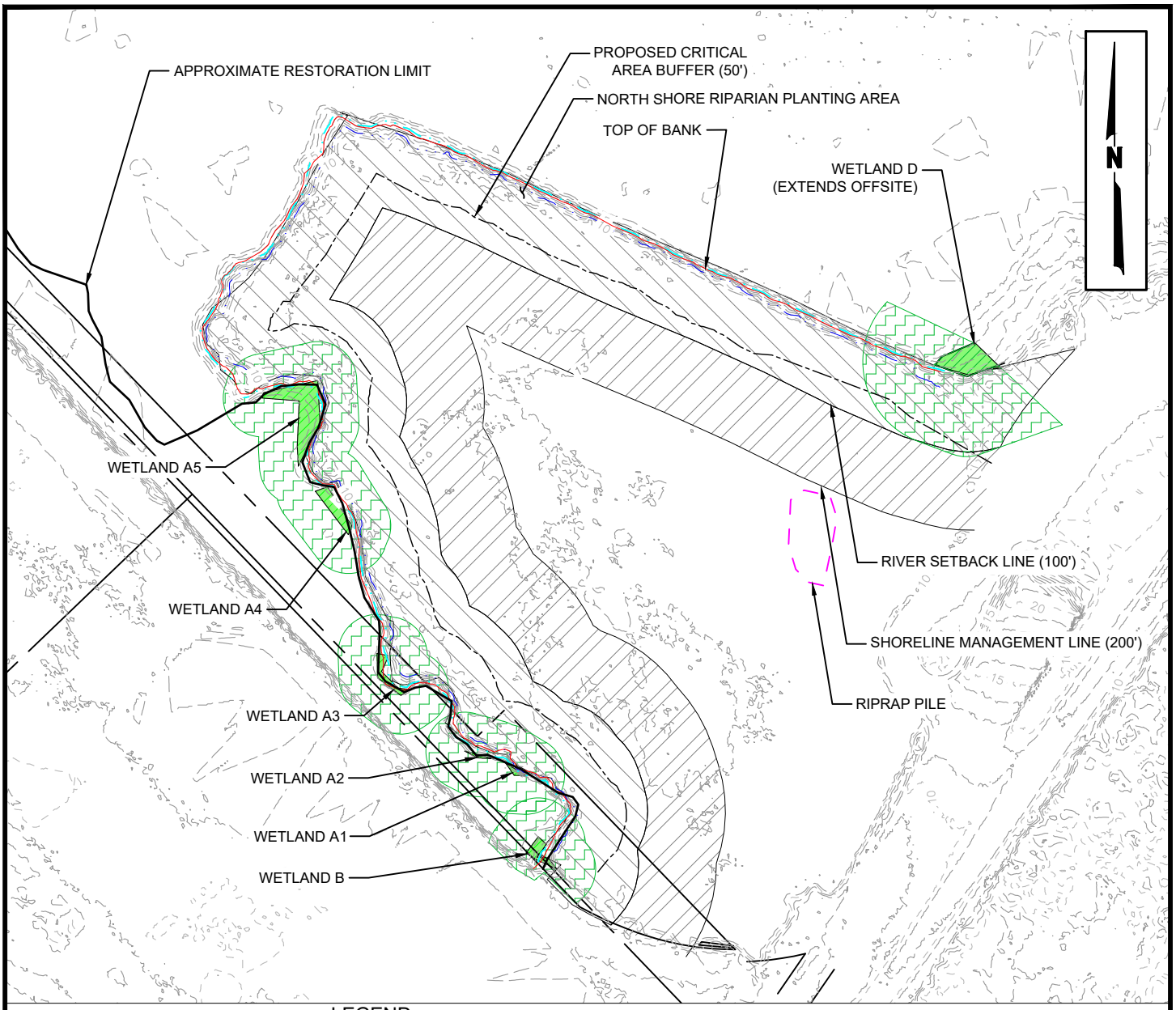
FIG. 3

Appendix A

Preliminary Plans



LEGEND

- EXISTING MINOR CONTOUR (1')
- EXISTING MAJOR CONTOUR (5')
- PROPOSED CRITICAL AREA BUFFER (50')
- EXISTING EXTREME TIDE (9')
- EXISTING MHHL (5.2')
- TOP OF BANK
- APPROXIMATE RESTORATION LIMIT
- PARCEL LINES
- WETLANDS
- WETLAND BUFFER
- RIVER SETBACK (100')
- SHORELINE MANAGEMENT ZONE (200')

0 200 400

Scale in Feet

NOTES

1. VERTICAL PROJECT DATUM: NGVD29.
2. HORIZONTAL PROJECT DATUM: NAD83 WASHINGTON STATE PLANES, NORTH ZONE, US FOOT.
3. PROPOSED CRITICAL AREA APPROXIMATED FROM TOP OF EXISTING BANK.
4. PUGET SOUND LiDAR CONSORTIUM (PSLC) CEDAR RIVER WATERSHED & FLOODPLAIN LiDAR, 2014.
5. LiDAR CONVERTED FROM NAVD88 TO NGVD29.

S&W JOB NO: 102336-006

CLIENT: PORT OF EVERETT

PROPOSED PROJECT:
BAYWOOD REDEVELOPMENT & SHORELINE INTERIM CLEANUP & RESTORATION - DESIGN CRITERIA

LOCATION: EVERETT, WA

TITLE: PRELIMINARY EXISTING CONDITIONS

DATE: JUNE 2019

SHEET 1 OF 9

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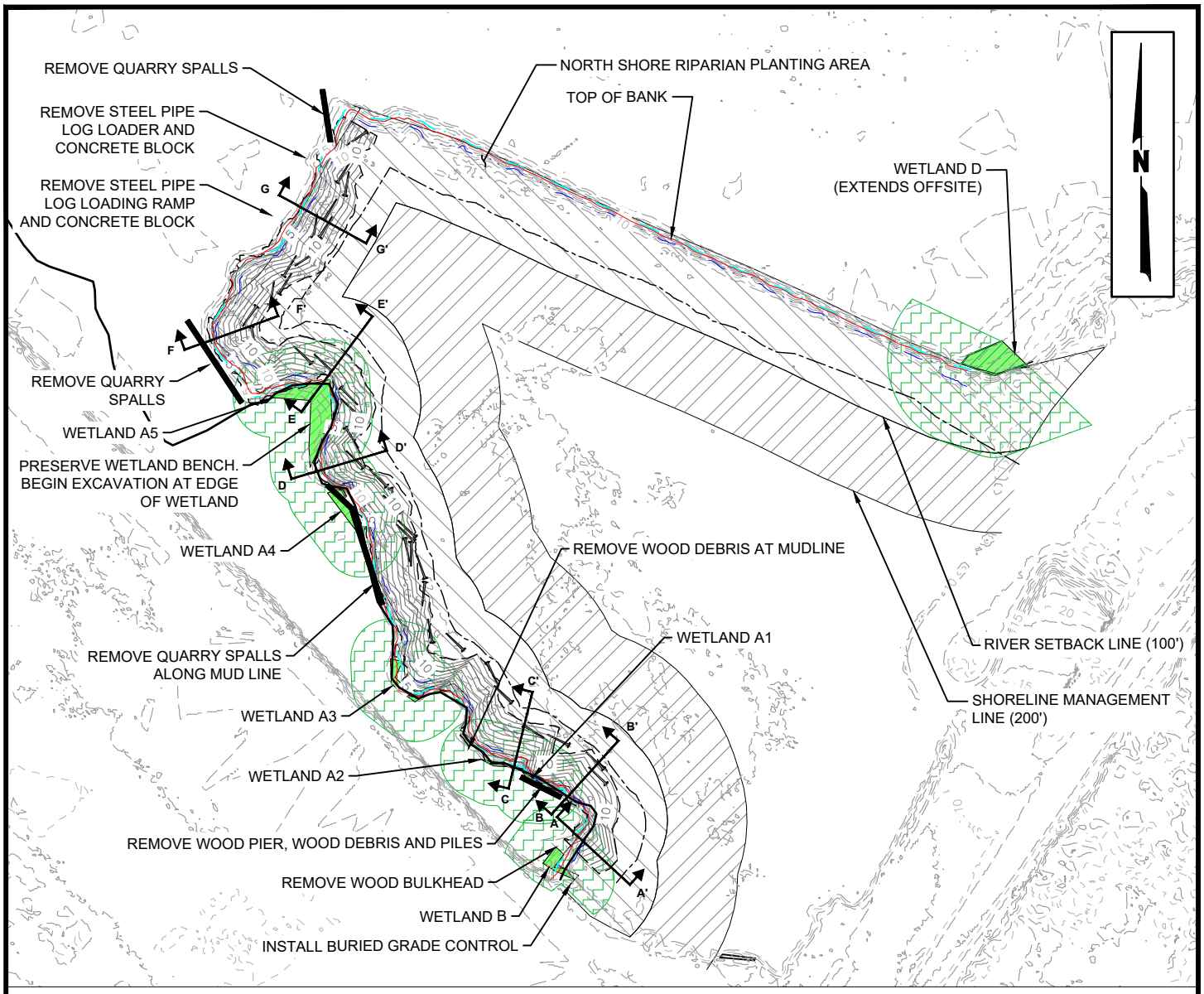

LEGEND

- EXISTING MINOR CONTOUR (1')
- EXISTING MAJOR CONTOUR (5')
- PROPOSED MAJOR CONTOUR (5')
- PROPOSED MINOR CONTOUR (1')
- PROPOSED CRITICAL AREA BUFFER (50')
- EXISTING EXTREME TIDE (9')
- EXISTING MHHL (5.2')
- TOP OF BANK
- APPROXIMATE RESTORATION LIMIT
- PARCEL LINES
- WETLANDS
- WETLAND BUFFER
- RIVER SETBACK (100')
- SHORELINE MANAGEMENT ZONE (200')
- LARGE WOODY DEBRIS (LWD)

0 200 400

Scale in Feet

NOTES

1. VERTICAL PROJECT DATUM: NGVD29.
2. HORIZONTAL PROJECT DATUM: NAD83 WASHINGTON STATE PLANES, NORTH ZONE, US FOOT.
3. PROPOSED CRITICAL AREA APPROXIMATED FROM TOP OF EXISTING BANK.
4. PUGET SOUND LiDAR CONSORTIUM (PSLC) CEDAR RIVER WATERSHED & FLOODPLAIN LiDAR, 2014.
5. LiDAR CONVERTED FROM NAVD88 TO NGVD29.

S&W JOB NO: 102336-006

CLIENT: PORT OF EVERETT

PROPOSED PROJECT:
BAYWOOD REDEVELOPMENT & SHORELINE INTERIM CLEANUP & RESTORATION - DESIGN CRITERIA

LOCATION: EVERETT, WA

TITLE: PRELIMINARY GRADING PLAN

DATE: JUNE 2019
SHEET 2 OF 9

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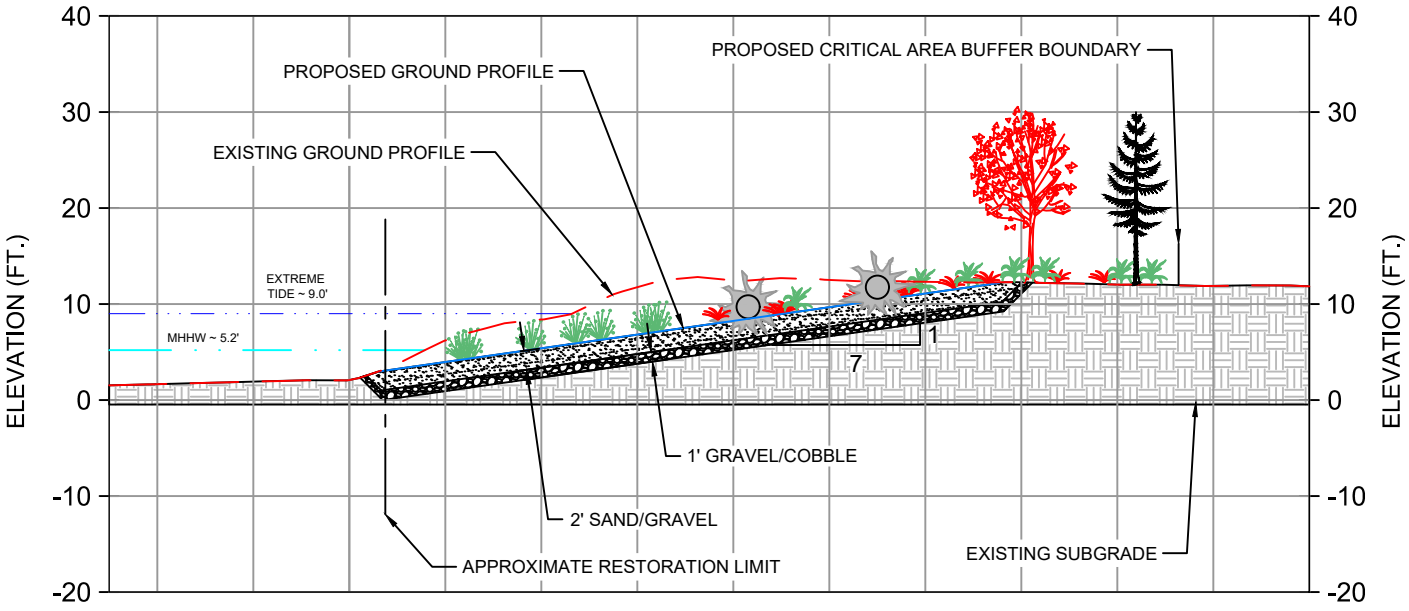


TYPICAL SECTION A-A' - E-E'

LEGEND

- EXISTING GROUND (LiDAR)
- DESIGN GRADE (7:1 SLOPE)
- EXTREME TIDE (9..0')
- MHHW (5.2')
- MTL (0.6')
- APPROXIMATED RESTORATION LIMIT
- SEDGE/RUSH
- TREES
- SHRUBS
- DUNE GRASS/GROUND COVER
- LWD
- SAND & GRAVEL
- GRAVEL & COBBLE
- EXISTING SUBGRADE

0 20 40

Scale in Feet

NOTES

1. VERTICAL PROJECT DATUM: NGVD29.
2. HORIZONTAL PROJECT DATUM: NAD83 WASHINGTON STATE PLANES, NORTH ZONE, US FOOT.
3. PROPOSED CRITICAL AREA APPROXIMATED FROM TOP OF EXISTING BANK.
4. PUGET SOUND LiDAR CONSORTIUM (PSLC) CEDAR RIVER WATERSHED & FLOODPLAIN LiDAR, 2014.
5. LiDAR CONVERTED FROM NAVD88 TO NGVD29.

S&W JOB NO: 102336-006

CLIENT: PORT OF EVERETT

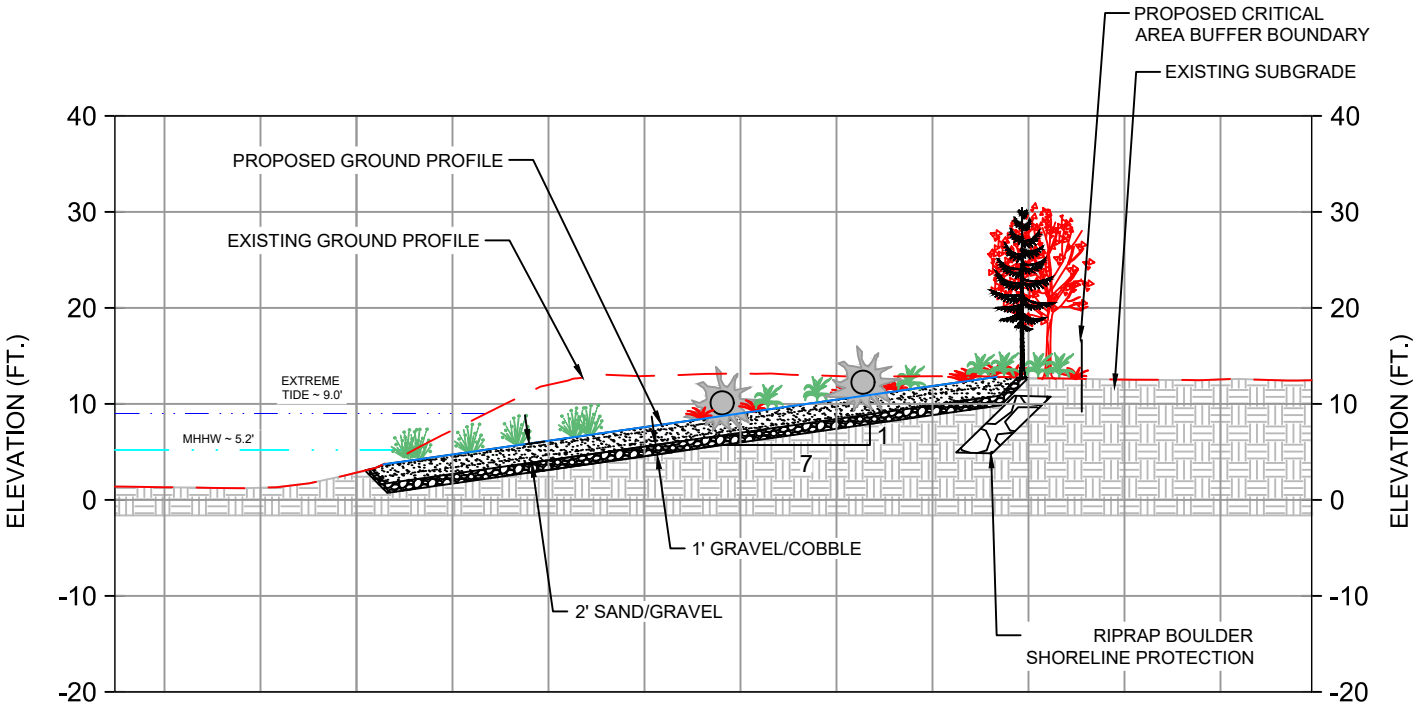
PROPOSED PROJECT:
BAYWOOD REDEVELOPMENT & SHORELINE INTERIM CLEANUP & RESTORATION - DESIGN CRITERIA

LOCATION: EVERETT, WA

TITLE: PRELIMINARY TYPICAL SECTION A-A' - E-E'

DATE: JUNE 2019

SHEET 3 OF 9



TYPICAL SECTION F-F' - G-G'

LEGEND

- EXISTING GROUND (LiDAR)
- DESIGN GRADE (7:1 SLOPE)
- EXTREME TIDE (9..0')
- MHHW (5.2')
- MTL (0.6')
- APPROXIMATED RESTORATION LIMIT
- SEDGE/RUSH
- TREES
- SHRUBS
- DUNE GRASS/GROUND COVER
- LWD
- SAND & GRAVEL
- GRAVEL & COBBLE
- EXISTING SUBGRADE
- RIPRAP

0 20 40

Scale in Feet

NOTES

1. VERTICAL PROJECT DATUM: NGVD29.
2. HORIZONTAL PROJECT DATUM: NAD83 WASHINGTON STATE PLANES, NORTH ZONE, US FOOT.
3. PROPOSED CRITICAL AREA APPROXIMATED FROM TOP OF EXISTING BANK.
4. PUGET SOUND LiDAR CONSORTIUM (PSLC) CEDAR RIVER WATERSHED & FLOODPLAIN LiDAR, 2014.
5. LiDAR CONVERTED FROM NAVD88 TO NGVD29.

S&W JOB NO: 102336-006

CLIENT: PORT OF EVERETT

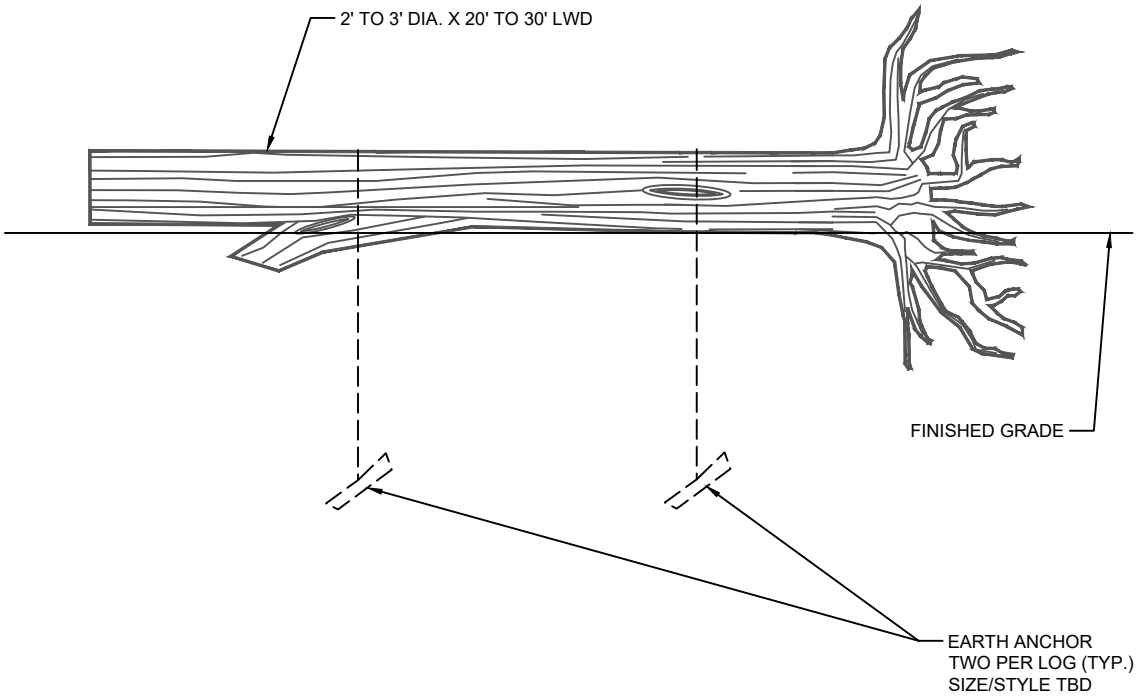
PROPOSED PROJECT:
BAYWOOD REDEVELOPMENT & SHORELINE INTERIM CLEANUP & RESTORATION - DESIGN CRITERIA

LOCATION: EVERETT, WA

TITLE: PRELIMINARY TYPICAL SECTION F-F' - G-G'

DATE: JUNE 2019

SHEET 4 OF 9



S&W JOB NO: 102336-006

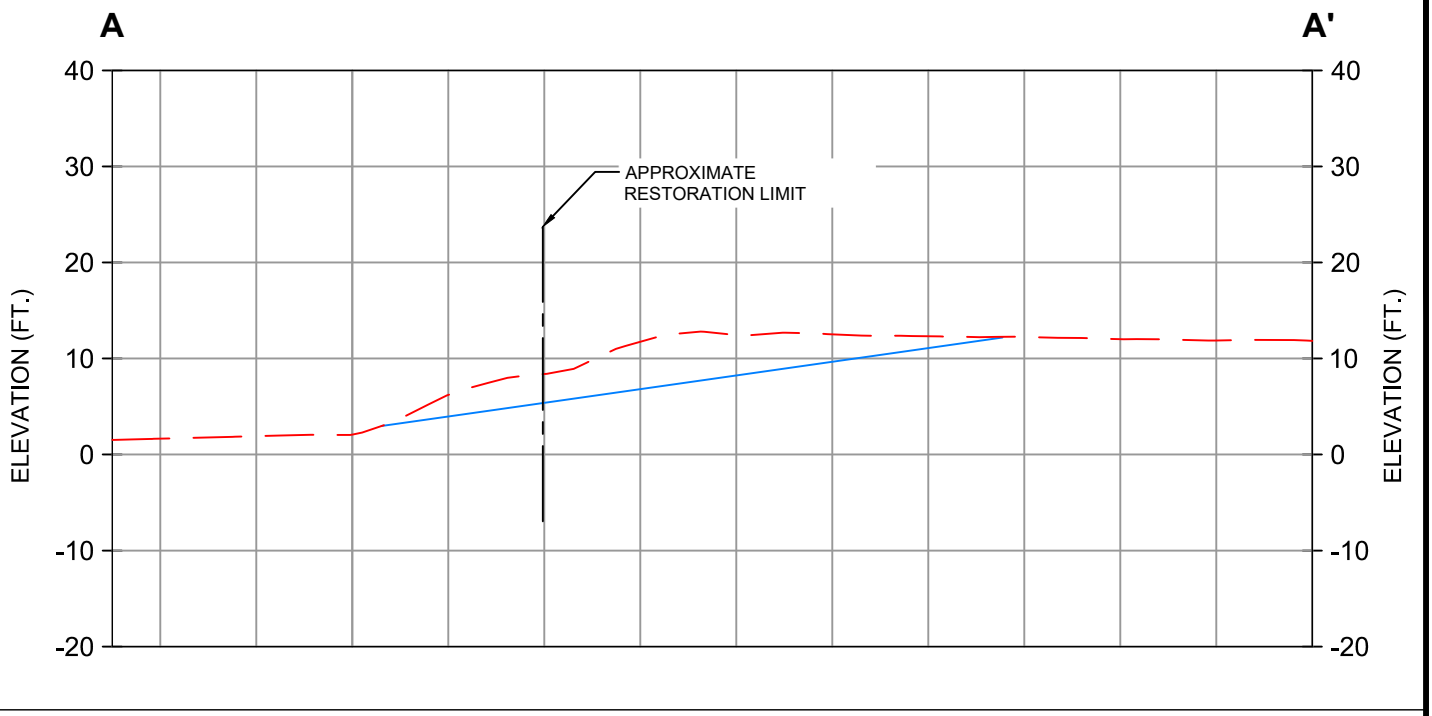
CLIENT: PORT OF EVERETT

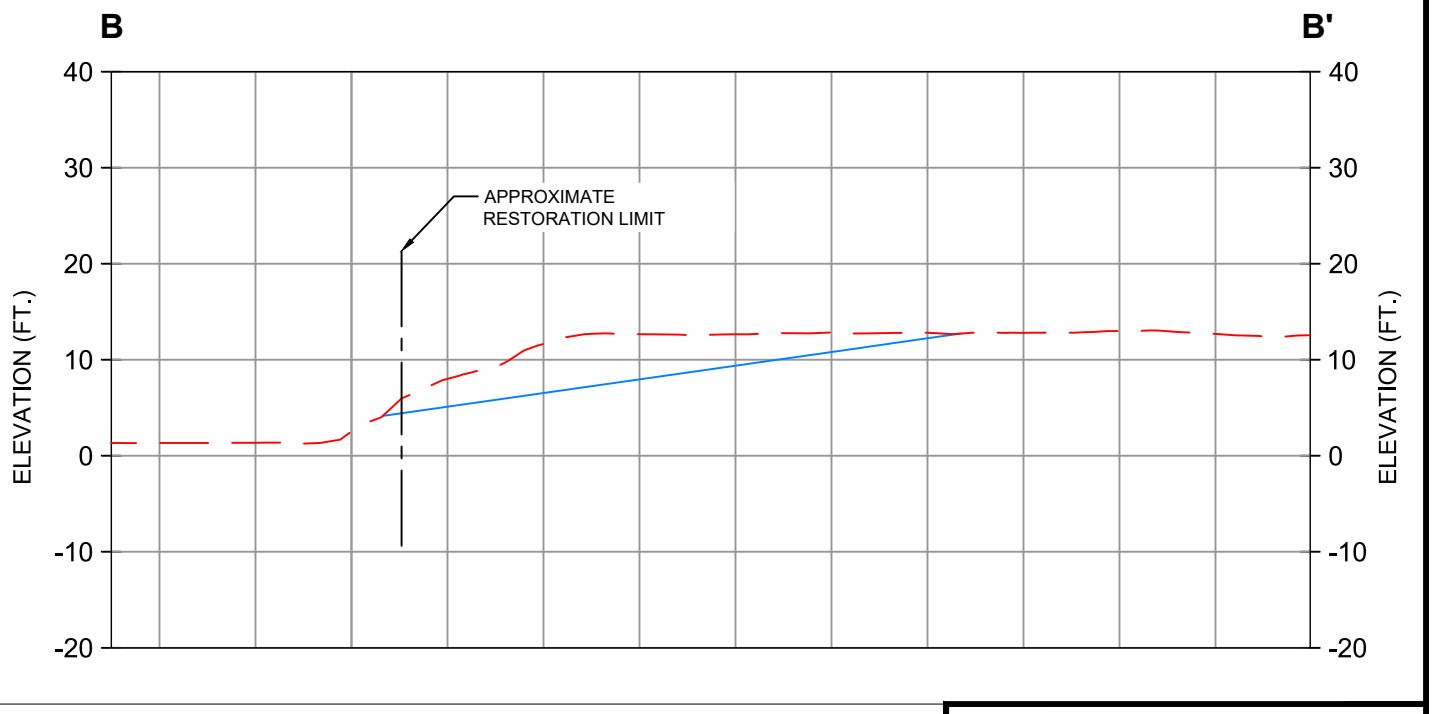
PROPOSED PROJECT:
BAYWOOD REDEVELOPMENT &
SHORELINE INTERIM CLEANUP &
RESTORATION - DESIGN CRITERIA

LOCATION: EVERETT, WA

TITLE: PRELIMINARY LWD DETAIL

DATE: JUNE 2019
SHEET 5 OF 9





LEGEND

- EXISTING GROUND (LiDAR)
- DESIGN GRADE (7:1 SLOPE)
- APPROXIMATE RESTORATION LIMIT

NOTES

1. VERTICAL PROJECT DATUM: NGVD29.
2. HORIZONTAL PROJECT DATUM: NAD83 WASHINGTON STATE PLANES, NORTH ZONE, US FOOT.

0 20 40

Scale in Feet

S&W JOB NO: 102336-006

CLIENT: PORT OF EVERETT

PROPOSED PROJECT:
BAYWOOD REDEVELOPMENT & SHORELINE INTERIM CLEANUP & RESTORATION - DESIGN CRITERIA

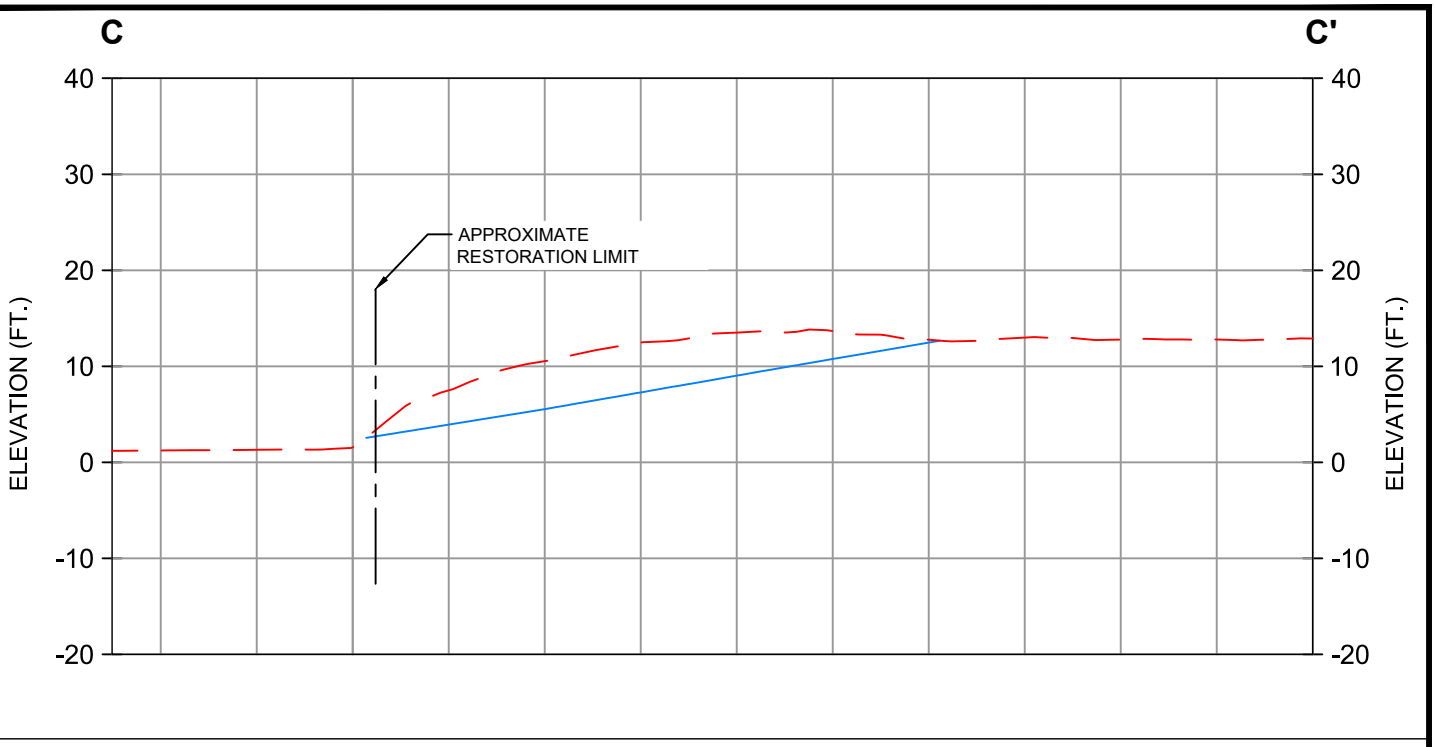
LOCATION: EVERETT, WA

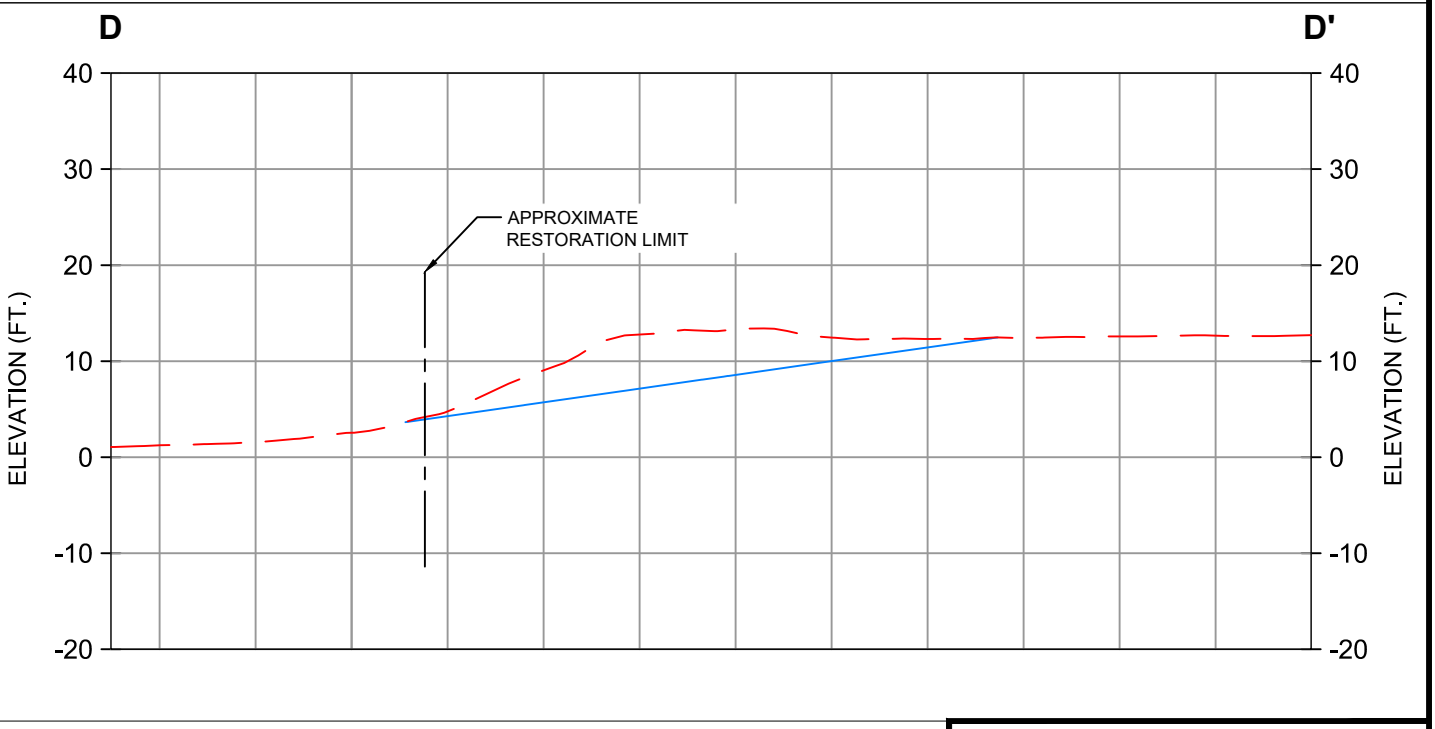
TITLE: PRELIMINARY SECTION VIEW A-A' - B-B'

DATE: JUNE 2019

SHEET 6 OF 9

Filename: I:\EF\SEA\102000s\102336 Port of Everett\Baywood\CAD\CONCEPTUAL GRADING PLAN\102336_Design Grade - 8.5X11.dwg Layout: 102336_05_SECTIONS A & B Date: 06-20-2019 Login: AWP





LEGEND

- EXISTING GROUND (LiDAR)
- DESIGN GRADE (7:1 SLOPE)
- APPROXIMATE RESTORATION LIMIT

NOTES

1. VERTICAL PROJECT DATUM: NGVD29.
2. HORIZONTAL PROJECT DATUM: NAD83 WASHINGTON STATE PLANES, NORTH ZONE, US FOOT.

0 20 40

Scale in Feet

S&W JOB NO: 102336-006

CLIENT: PORT OF EVERETT

PROPOSED PROJECT:
BAYWOOD REDEVELOPMENT & SHORELINE INTERIM CLEANUP & RESTORATION - DESIGN CRITERIA

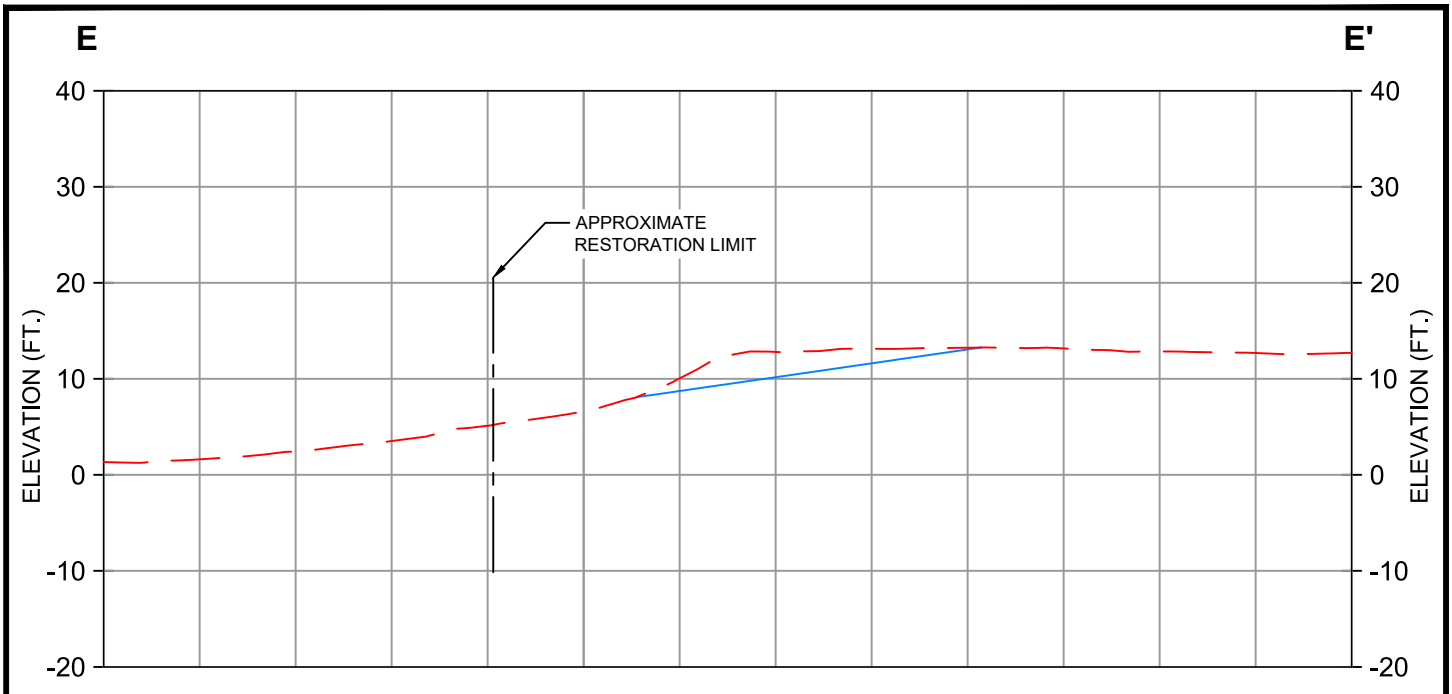
LOCATION: EVERETT, WA

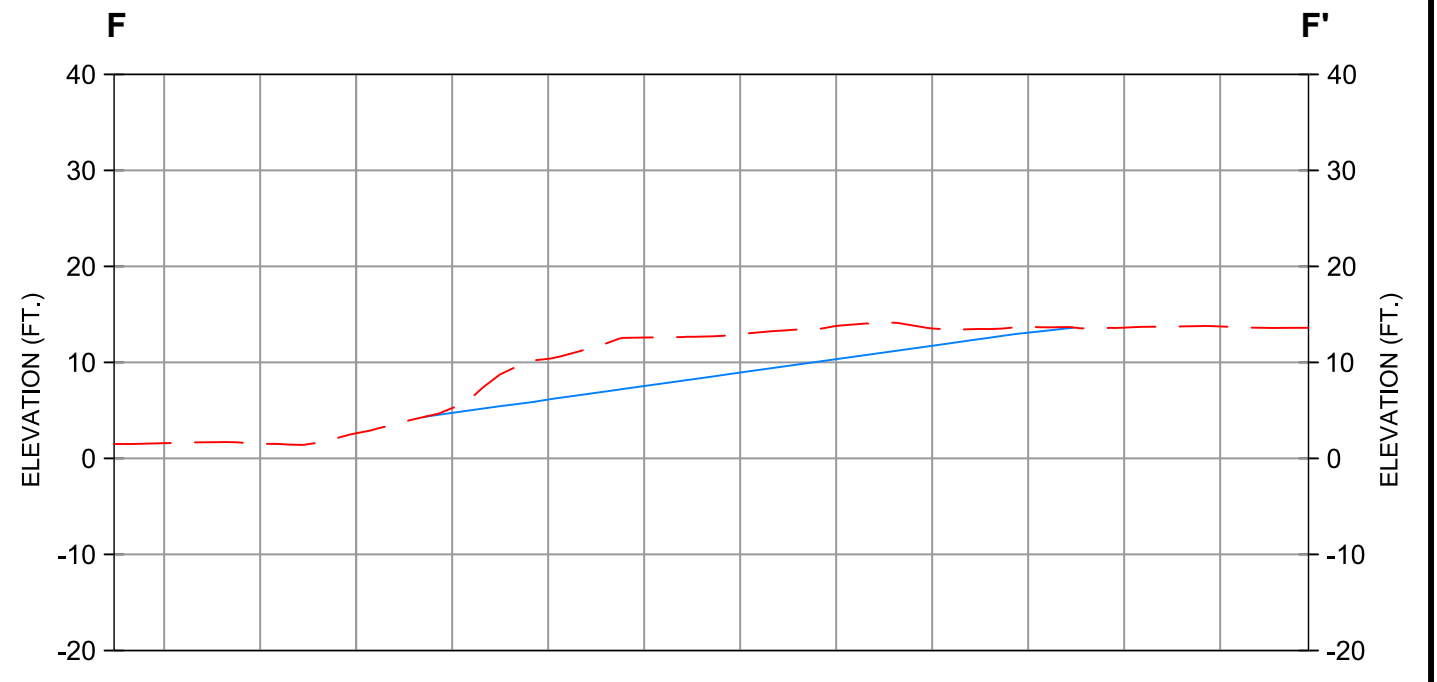
TITLE: PRELIMINARY SECTION VIEW C-C' - D-D'

DATE: JUNE 2019

SHEET 7 OF 9

Filename: I:\EF\SEA\102000s\102336 Port of Everett\Baywood\CAD\CONCEPTUAL GRADING PLAN\102336_Design Grade - 8.5X11.dwg Layout: 102336_06_SECTIONS C & D Date: 06-20-2019 Login: AWP





LEGEND

EXISTING GROUND (LiDAR)

DESIGN GRADE (7:1 SLOPE)

APPROXIMATE RESTORATION LIMIT

NOTES

1. VERTICAL PROJECT DATUM: NGVD29.
2. HORIZONTAL PROJECT DATUM: NAD83 WASHINGTON STATE PLANES, NORTH ZONE, US FOOT.

0 20 40

Scale in Feet

S&W JOB NO: 102336-006

CLIENT: PORT OF EVERETT

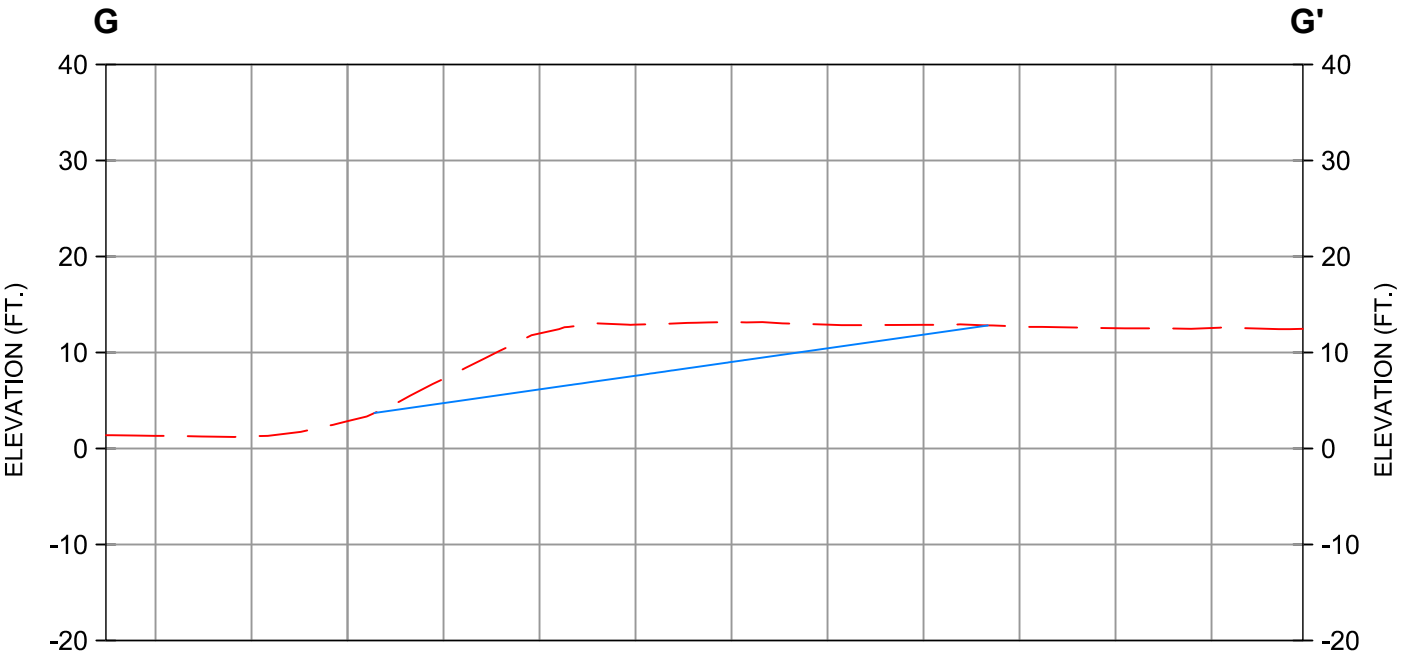
PROPOSED PROJECT:
BAYWOOD REDEVELOPMENT & SHORELINE INTERIM CLEANUP & RESTORATION - DESIGN CRITERIA

LOCATION: EVERETT, WA

TITLE: PRELIMINARY SECTION VIEW E-E' - F-F'

DATE: JUNE 2019

SHEET 8 OF 9



LEGEND

EXISTING GROUND (LiDAR)

DESIGN GRADE (7:1 SLOPE)

NOTES
1. VERTICAL PROJECT DATUM: NGVD29.
2. HORIZONTAL PROJECT DATUM: NAD83 WASHINGTON STATE PLANES, NORTH ZONE, US FOOT.

0 20 40

Scale in Feet

S&W JOB NO: 102336-006

CLIENT: PORT OF EVERETT

PROPOSED PROJECT:
BAYWOOD REDEVELOPMENT & SHORELINE INTERIM CLEANUP & RESTORATION - DESIGN CRITERIA

LOCATION: EVERETT, WA

TITLE: PRELIMINARY SECTION VIEW G-G'

DATE: JUNE 2019

SHEET 9 OF 9