FINAL
ADVANCE MITIGATION PLAN

LOWER WAPATO CREEK HABITAT PROJECT

Port of Tacoma

June 1, 2020
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Port of Tacoma

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Executive Summary

The Port of Tacoma (Port) proposes a habitat improvement project to restore Wapato Creek with a diverse mosaic of interconnected estuary, emergent, and forested wetlands and riparian habitat as advance permittee-responsible compensatory mitigation (hereafter referred to as advance mitigation) to mitigate for unavoidable impacts to wetlands and non-Endangered Species Act (ESA)-listed fish habitat resulting from future Port projects. The Lower Wapato Creek Habitat Project (LWCHP or Project) is located on 18.52 acres of Port-owned land approximately 0.46 mile from the mouth of Wapato Creek where it enters into the Blair Waterway (Commencement Bay). The LWCHP site consists of five tax parcels (Habitat Site: 03200130055, 0320013157, 0320013158, and 0320017003; Disposal Site: 0320011117) in the City of Fife and the City of Tacoma, Washington within Township 20 North, Range 03 East, Section 01, Willamette Meridian (Figure 1).

Under existing conditions, Wapato Creek enters the Project site through two undersized (60-inch), perched culverts that create a partial fish passage barrier where the creek crosses under 12th Street East. The ditched creek turns 90 degrees immediately after the culverts and flows west, parallel to 12th Street East; then the creek turns 90 degrees again and flows north, parallel to East Alexander Avenue, exiting the Project site at State Route (SR) 509. The existing stream buffer for Wapato Creek along 12th Street East is approximately 10 feet wide along the left bank and is dominated by grasses and invasive species. The stream buffer along East Alexander Avenue is approximately 70 feet wide and is also dominated by grasses and invasive species, as well as access roads to power poles within 10 feet of Wapato Creek. The creek has been constructed into a trapezoidal ditch and in-stream habitat is limited with no habitat structure or complexity; Wapato Creek is confined, straight, incised and artificial with no accessible floodplain. The Project site was previously filled with dredged materials and currently contains high densities of invasive and noxious weed species including reed canarygrass (*Phalaris arundinacea*), Scotch broom (*Cytisus scoparius*), Himalayan blackberry (*Rubus armeniacus*), and poison hemlock (*Conium maculatum*), among others.

The proposed restoration actions are intended to provide large-scale contiguous habitat restoration on a site containing Wapato Creek, a creek that discharges directly to Commencement Bay. This type of landscape-scale habitat restoration has a greater functional uplift to the ecosystem as opposed to conducting small, disconnected concurrent mitigation actions (on-site or off-site) throughout Port property on a project-by-project basis.

The proposed LWCHP design will reestablish a portion of the creek channel and associated features to as close to the historic creek location as possible, create diverse tidal and non-tidal wetland habitat functions, and provide forested riparian upland area for Wapato Creek. The Project will retain as many existing mature trees as possible and add a significant number of conifer trees where appropriate, provide a fence around the perimeter of the site and create a separation of the site from adjacent development by means of topographic diversity (hummocks and raised ground elevations). The Project will also remove an existing partial fish passage barrier (two 60-inch perched culverts) and install a full-span bridge at the 12th Street East crossing to provide unimpeded fish access and habitat connectivity upstream of the project, improve flood conveyance, and restore natural stream processes such as sediment movement.

The Project was originally proposed and partially permitted in 2014; however, it was put on hold prior to receiving all the permits and the previously-issued permits have expired. The proposed Project is similar to the originally-permitted project; however, improvements to the design have been completed since 2014. These improvements include a full-span bridge, narrowing the 12th Street East bridge section design from 80 feet to 50 feet, increasing the number of conifers in the forested riparian upland area, improving the vegetative buffer on the eastern boundary, reducing bank slopes, adjusting the channel and buffer elevations including additional hummocks for microtopographic diversity, and adding more Large Woody Material (LWM) for increased in-stream habitat complexity as well as channel and bank stability.

The 18.52-acre advance mitigation site will provide the following approximate creditable and non-creditable mitigation types and quantities:

- 10.02 acres of creditable aquatic resource re-establishment/upland enhancement
    - 2.91 acres of palustrine forested wetland (PFO) re-establishment
    - 4.04 acres of estuarine emergent wetland (EEM) re-establishment
    - 2.23 acres of stream channel/mudflat re-establishment
        - 1,040 linear feet (LF) of the existing degraded, artificially-ditched Wapato Creek channel into 1,875 LF of meandering creek channel
    - 0.84 acre of forested riparian upland enhancement (UPL), EEM, and/or PFO re-establishment (depending on actual post-construction conditions and final grading and planting design as discussed in this Advance Mitigation Plan)
- 8.50 acres of non-creditable area, including:
    - 7. 40 acres of forested riparian upland buffer
    - 0.88 acre of right-of-way (ROW)/vegetated filter strip
        - 0.03 acre of the Project is within the existing ROW and does not count towards the 18.52-acre site.
    - 0.20 acre of Wapato Creek channel/intertidal mudflat re-establishment and rehabilitation that does not count towards the creditable acreage
    - 0.05 acre of EEM rehabilitation that does not count towards the creditable acreage

These are the proposed initial mitigation types and quantities used to estimate the number of credits generated from the proposed Project. The Port will take a phased approach to credit generation based on actual on-site conditions that develop after construction. The actual number of wetland credits generated from the project will be determined after the Year 1 monitoring effort and report and before the first request for credit use. Based on subsequent monitoring events, the number of wetland credits generated for each habitat type may be updated accordingly to reflect on-site conditions.

The proposed two-year contractor warranty and irrigation system, and the proposed site protection, monitoring, maintenance and long-term stewardship will ensure the successful development of a sustainable ecosystem in an area that otherwise has limited fish and wildlife habitat. The proposed LWCHP advance mitigation will generate an estimated 9.35-10.02 acre-credits from aquatic habitat re-establishment and forested riparian upland enhancement.

According to the current project schedule construction will begin in 2021 and will be substantially complete in fall of 2022 at which time earthwork will be complete and the majority of plants will be installed. Year 0 as-built surveys for the LWCHP will occur in late 2022/early 2023. Monitoring will occur for 10 years starting during the 2023 growing season (Year 1) and extend through the

growing season of 2032 (Year 10). Throughout the monitoring period, an adaptive management plan will be implemented to help achieve the proposed goals, objectives, and performance standards. If necessary, contingency plans will be implemented.

This Advance Mitigation Plan (AMP) details the baseline conditions, the mitigation work plan, performance standards, and monitoring. This AMP also describes the mitigation credit and debit approach for the advance mitigation site, including how credits are determined for mitigation activities, how debits are determined for future unavoidable impacts, how credits will be released and made available for debiting, and how debited credits will be tracked in a ledger.

1 Introduction

The Port of Tacoma (Port) is proposing a habitat improvement project to restore 18.52 acres along the lower reach of Wapato Creek, located in an area locally known as the Tacoma Tideflats, mostly within the City of Tacoma and immediately adjacent to the City of Fife, Washington (Figure 1). The 12th Street E culverts and bridge replacement is mostly within the City of Fife. The site is referred to as the Lower Wapato Creek Habitat Project (LWCHP or Project) and includes 10.02 acres of creditable aquatic resource re-establishment and forested riparian upland enhancement (habitat restoration) to be used as advance permittee-responsible compensatory mitigation (hereafter referred to as advance mitigation) to mitigate for unavoidable impacts to aquatic resources (wetlands) and fish habitat (downstream of LWCHP on Wapato Creek) with no Endangered Species Act (ESA)-listed species resulting from future Port projects.

Approval of this Advance Mitigation Plan (AMP) is a component of the permit application package in support of the permit review for construction of the LWCHP from the U.S. Army Corps of Engineers (USACE), Washington State Department of Ecology (Ecology), Washington State Department of Fish and Wildlife (WDFW), and the City of Tacoma.

The LWCHP is located on and adjacent to the existing Wapato Creek channel, which is a perennial, fish-bearing stream, approximately 0.46 river mile (RM) upstream (south) of where Wapato Creek discharges into the Blair Waterway. The Blair Waterway is a U.S. Army Corps of Engineers (USACE) navigational channel with a direct connection to Commencement Bay. The drainage basin for Wapato Creek is approximately 3.5 square miles and includes most of the City of Fife and a portion of the lower Puyallup Valley (WSDOT 2019).

The LWCHP will restore habitat conditions by realigning the Wapato Creek channel to as close to its historic channel alignment as possible and re-establishing an estuarine emergent and palustrine forested wetland mosaic within the floodplain of Wapato Creek. Removal of fill and excavation of the creek channel will improve Wapato Creek and wetland connectivity, better fish habitat conditions by providing in-stream foraging and refuge habitats, increase floodwater storage capacity in the lower Wapato Creek basin, and create and enhance forested riparian upland. The restoration actions will also involve eradicating invasive vegetation and planting a diversity of native plant species.

The content of this AMP is consistent with the requirements for a concurrent mitigation plan according to the joint Ecology, USACE, and Environmental Protection Agency (EPA) guidance document *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (Ecology et al. 2006b). In addition, this report provides additional information as required and recommended in the *Interagency Regulatory Guide – Advance Permittee-Responsible Mitigation*, published by USACE, Ecology and WDFW (USACE et al. 2012), and other guidance as referenced below.

1.1 Project Purpose and Need

The purpose of the LWCHP is to provide advance mitigation to offset future Port development projects that impact wetlands and non-ESA-listed fish habitat (hereafter referred to as fish habitat) on lower Wapato Creek. Advance mitigation is a form of permittee-responsible compensatory mitigation constructed in advance of a permitted impact. Permittee-responsible mitigation is defined by 33 Code of Federal Regulations (CFR) 332.2 as "aquatic restoration, establishment,

enhancement and/or preservation activity undertaken by the permittee to provide compensatory mitigation for which the permittee retains full responsibility." Consistent with the joint guidance published by USACE, Ecology and WDFW (USACE et al. 2012), the purpose of the advance mitigation site is to provide mitigation in advance of impacts so the temporal loss of functions common with concurrent mitigation is eliminated or reduced.

The proposed restoration actions are intended to provide large-scale contiguous habitat restoration on a site containing Wapato Creek, a creek that discharges directly to Commencement Bay. This type of landscape-scale habitat restoration has a greater functional uplift to the ecosystem as opposed to conducting small, disconnected concurrent mitigation actions (on-site or off-site) throughout Port property on a project-by-project basis. Consolidating small wetland impacts into one, larger mitigation site will provide greater overall ecological and floodplain benefits to Wapato Creek and Commencement Bay. The LWCHP will create diverse estuarine habitat and tidal and non-tidal wetland functions not currently present along Wapato Creek and that are very limited within the Commencement Bay/Tacoma Tideflats area in general. It will also correct a partial fish passage barrier at the 12th Street East culverts, improve creek channel, floodplain, and wetland connectivity, and provide a forested riparian upland area. Additionally, the proposed two-year contractor warranty and irrigation system, and the proposed site protection, monitoring and maintenance actions will provide increased potential for successful development of a sustainable ecosystem in an area that otherwise has limited fish and wildlife use.

1.2 History of Mitigation at the Port of Tacoma

The Port has a 30-plus-year history of successfully completing and maintaining habitat/mitigation projects and providing exceptionally high ecological value instead of only the minimum required. The Port created its first habitat mitigation project in 1986 (Gog-le-hi-te I). Since then, the Port has constructed, participated in or preserved over 20 sites, the most recent of which occurred in 2016 (Upper Clear Creek Mitigation Site [UCCMS] and associated Mitigation Bank). These habitat sites are a result of compensatory mitigation, impact remediation (Natural Resource Damage Assessment [NRDA] mitigation), or open space preservation provided as a public benefit. The Port's fundamental mitigation approach is rooted in the Puyallup Lands Claim Settlement of 1988. That approach is to build habitat mitigation in advance of its need (most permits give a project proponent five years after impact to build mitigation), and to focus on salmon recovery as opposed to narrower views of compensatory mitigation such as wetlands with no salmon habitat (minimum requirements). In 2014, the Port Commission memorialized this approach in the Port-Wide Mitigation Strategy (Port of Tacoma Resolution 2014-02).

A majority of the habitat mitigation sites have successfully completed a monitoring period to demonstrate that performance standards were achieved. A few sites are still undergoing monitoring and maintenance. Table 1 presents a chronological summary of the habitat sites the Port has participated in and the associated monitoring status.

Table 1. Existing Port Habitat Sites

Habitat Site	Size (acres)	Year[1]	Habitat Type[2]	Public Access?	Monitoring Status
Gog-le-hi-te I	3.97	1986	Estuarine intertidal/ riverine tidal	Yes	Complete
Slip 5 (Phase I)	2.50	1988	Estuarine intertidal	No	Complete
Slip 5 (Phase II)	0.20	1991	Estuarine intertidal	No	Complete
Mowitch NRDA[3]	3.17	1993	Estuarine intertidal/ riverine tidal	No	Complete
Milwaukee Waterway	30.00	1995	Estuarine intertidal and subtidal	No	Complete
Outer Hylebos[3]	1.60	1995/ 2011	Estuarine intertidal	No	Complete
Fairliner	3.35	1996	Estuarine intertidal and subtidal	No	Complete
Rhone-Poulenc[3]	1.25	1996	Estuarine intertidal	Yes	Complete
Clear Creek (Phase I)	9.70	1998	Riverine lower perennial	No	Complete
Clear Creek (Phase II)	6.50	2003	Riverine lower perennial	No	Complete
Gog-le-hi-te Habitat Improvement Action	1.13	2003	Estuarine intertidal/ riverine tidal	Yes	Complete
Slip 5 (Phase III)	7.00	2005	Marine intertidal and subtidal	No	Complete
Inner Hylebos Peninsula[3]	1.70	2005	Estuarine intertidal	Yes	Complete
Orting Habitat Preservation Area[3]	9.64	2005	Riverine lower perennial	Yes	Complete
Gog-le-hi-te II	8.38	2007	Estuarine intertidal/ riverine tidal	Yes	Complete
Julia's Gulch[3]	31.00	2007	Riverine upper perennial	Yes	Not required
APM Seaplane Ramp	0.29	2009	Estuarine intertidal	No	Complete
Dick Gilmur Public Access[4]	2.00	2010	Marine intertidal	Yes	Not required
Sound Refining Cove[3]	20.66	2011	Estuarine intertidal	No	Non-Port Action
Place of Circling Waters[5]	30.00	2011	Estuarine intertidal/ riverine tidal	Yes	In progress (2021)
EB-1B Alexander Avenue[6]	1.70	2014	Palustrine scrub-shrub	Yes	In progress (2024)
Upper Clear Creek[7]	40.00	2016	Riverine lower perennial	No	In progress (2026)

Notes:
[1] Year stated is generally the year the mitigation site was constructed, or preservation/conservation easement obtained for sites including Julia's Gulch and the Orting Property.
[2] Habitat type based of classification of wetlands and deepwater habitats of the United States (Cowardin et al. 1979).
[3] Some habitat sites include Port participation only. The Port may own the land but is managed by others (Mowitch NRDA, Sound Refining Cove, Julia's Gulch); deeded to another entity (Rhone-Poulenc, Orting Habitat Preservation Area); or is owned and maintained by another entity (Inner Hylebos, Outer Hylebos).
[4] Dick Gilmur Public Access consists of open space preservation and public access associated with proposed Saltchuk habitat site.
[5] Place of Circling Waters mitigation site is comprised of four individual sites: NRDA restoration at 14.25 acres, former owner violation at 3.36 acres, LAGS mitigation at 1.06 acres, and advance mitigation at 10.14 acres.
[6] The Port restored portions of the EB-1B wetland and associated buffer as part of a settlement agreement with EPA, Consent Decree No. 11-cv-05253 (W.D. Wa). It is considered a restoration site, not mitigation. The site is accessible by the public but it is not a designated public access area.
[7] Upper Clear Creek mitigation site is comprised of two individual sites: a settlement agreement with EPA, Consent Decree No. 11-cv-05253 (W.D. Wa) at 12.59 acres, and (future umbrella) mitigation bank site at ~28.50 acres.

2 Goals and Objectives

The Port is proposing to construct a permittee-responsible advance mitigation site, per the requirement (1.a.) set forth in the joint regulatory agency guidance (USACE et al. 2012). Advance mitigation at the LWCHP site is to mitigate for future Port projects located in the City of Tacoma within the vicinity of Commencement Bay.

The goal of the LWCHP is to restore ecological functions and processes in and near Wapato Creek. The advance mitigation plan has two central goals:

- Replace aquatic resource (wetland) acreage and functions that are lost or impacted by future Port projects.
- Offset impacts to fish habitat for non-ESA-listed fish species from future Port projects that impact Wapato Creek downstream of the LWCHP site.

Specific LWCHP site restoration objectives include the following:

- Objective 1: Restore Wapato Creek from a straight ditch to a meandering, tidally-influenced channel with a functioning floodplain and in-stream habitat features;
- Objective 2: Re-establish intertidal mudflats and hydrologically connected estuarine emergent and palustrine forested wetlands;
- Objective 3: Establish and preserve a dense forested riparian upland; and
- Objective 4: Improve fish passage at the 12th Street East crossing.

Performance standards will be used to measure whether or not an objective has been met. See Section 8 for details associated with how performance standards will measure success of each objective.

3 Geographic Service Area

When future Port development projects are planned and designed, each project will follow requirements for mitigation sequencing as outlined in the State Environmental Policy Act (SEPA) (Washington Administrative Code [WAC] 197-11-768); joint guidance from Ecology, USACE and EPA (Ecology et al. 2006a); and City of Tacoma Municipal Code (TMC) Critical Areas Protection Ordinance (CAPO) (TMC 13.11.270). The following mitigation sequence is required:

1. Avoid the impact altogether by not taking a certain action or parts of an action;
2. Minimize impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
3. Rectify the impact by repairing, rehabilitating, or restoring the affected environment;
4. Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action;
5. Compensate for the impact by replacing, enhancing, or providing substitute resources or environments; and/or
6. Monitor the impact and take appropriate corrective measures.

After following the mitigation sequence, credits generated at an advance mitigation site may be considered to provide compensation for unavoidable impacts to wetlands or fish habitat resulting from future Port projects that cannot be mitigated at the impact site. In these situations, wetland or fish habitat impacts will be characterized and quantified to determine the appropriate type and amount of debits that will result in a corresponding subtraction of credits generated at the advance mitigation site (see Section 11.3 Credit/Debit Accounting).

Unavoidable impacts to wetlands or fish habitat as a result of future Port projects and proposed use of credits from the LWCHP advance mitigation site will be subject to approval by the regulatory agencies (e.g., USACE, Ecology, WDFW, City of Tacoma) through standard permit review processes (e.g., Clean Water Action Sections 401 and 404, Hydraulic Project Approval, City of Tacoma CAPO and/or Shoreline Master Program). During the permit review process, regulators will evaluate whether the credits generated at the advance mitigation site are adequate and appropriate for the type and extent of aquatic resource impacts that result from future Port projects.

Joint regulatory guidance (1.g.) recommends providing a proposed boundary of the geographic area that is appropriate to be used for future impact locations (USACE et al. 2012). A review of Port-owned sites with potential to impact wetlands or fish habitat was conducted to identify the types of aquatic resources that may experience unavoidable impacts after going through mitigation sequencing. The potential future development sites within the geographic service area with possible habitat impacts include, but may not be limited to, those listed in Table 2.

Table 2. Potential Future Development Sites

Potential Development Sites with Possible Aquatic Impacts	Port Parcel(s)	Tax Parcel Number(s)	Impacted Habitat Type
EB-1B	10	0321363036	Palustrine / Estuarine
Pierce County Terminal (PCT)	13, 16	0320021002, 0320012066	Palustrine / Estuarine (Wapato Creek) / Stormwater Ditch
Parcel 15 (former Portac site)	15	5000350150	Estuarine (Wapato Creek)
Progress Rail	34	0320013143, 0320017021, 0320024099	Palustrine / Stormwater Ditch
Americold	35A	0320023065, 5190000024, 5190000040	Palustrine / Stormwater Ditch
Fabulich Center	35B	0320024099	Stormwater Ditch
Parcel 72 (1702 Port of Tacoma Road)	72	6965000380, 6965000390	Palustrine
Parcel 77 Auto Import Terminal	77	0321363013, 0321363033, 321363034, 0321363037	Palustrine / Estuarine
Parcel 85 (1451 Thorne Road)	85	6965000350	Palustrine
Parcel 114 (former PQ property)	114	0321263016, 2275200260	Stormwater Ditch
Parcel 117 (TPU or snail property)	117	0321263045, 03213502064	Palustrine / Stormwater Ditch

The Geographic Service Area has been developed to include areas in close proximity to the LWCHP site with similar biological and physical conditions. The Geographic Service Area includes the portion of Water Resource Inventory Area (WRIA) 10 – Puyallup-White within the Eastern Puget Riverine Lowlands ecoregion from Commencement Bay eastward to State Route (SR) 512/167, as shown on Figure 2, Geographic Service Area. The Eastern Puget Riverine Lowland ecoregion includes floodplains and terraces historically containing widespread riverine and wetland habitats. Many wetlands were drained to accommodate pastures, croplands and urban areas (Pater et al. 1998). Elevations range between 0 and 800 feet above sea level (King County 2020). All the potential development sites listed in Table 2 with possible impacts to aquatic resources are located in the Eastern Puget Riverine Lowland ecoregion of WRIA 10.

Mitigation needs at the potential development sites listed in Table 2 may include impacts to wetlands, lower Wapato Creek, or stormwater ditches. Palustrine wetlands within the potential development sites primarily consist of low- to moderate-functioning wetlands (Category III or IV) with low habitat value. The wetlands listed in Table 2 typically have a high density of invasive vegetation, and usually have minimal, reduced, and/or interrupted upland buffers based on multiple wetland delineation reports (most recently Grette Associates 2020). Creeks that may be impacted due to development include Wapato Creek (downstream of the proposed LWCHP area), which is channelized with limited habitat.

The existing conditions at the LWCHP site, which include a channelized, artificially-straightened segment of Wapato Creek, dense communities of invasive species, and low-functioning riparian buffers (minimal, reduced and interrupted) are similar to the conditions at the potential development sites with possible impacts (Table 2). The proposed restoration actions on one

contiguous site represent an ecologically appropriate alternative to conducting small-scale, on-site mitigation actions at individual sites within the Geographic Service Area.

4 Site Selection

The LWCHP advance mitigation site was selected using a watershed approach, per the requirement (1.b.) set forth in the joint regulatory agency guidance (USACE et al. 2012). In addition, the following demonstrated use of a watershed approach is consistent with 33 CFR 332.3(c) and Ecology's guidance *Selecting Wetland Mitigation Sites Using a Watershed Approach* (Ecology 2009). This approach considers long-term sustainability of proposed restoration actions, and suitability for replacing lost aquatic resource functions resulting from future Port projects.

Commencement Bay and the aquatic resources within the proposed Geographic Service Area have been highly impacted and altered over the last 150 years from activities associated with development of a deep-water port and upland industrial area, including dredge and fill activities. Wapato Creek historically flowed into Commencement Bay as part of the Puyallup River estuary but was disconnected when the Puyallup River was diked for agricultural and development purposes beginning in the mid- to late-1800s. These activities resulted in the loss of the majority of ecologically important mudflat and estuarine wetland habitat types, and led to the presence of relatively small, low-functioning, isolated wetlands with limited vegetative diversity.

Wapato Creek is now a direct perennial tributary to Commencement Bay; however, it is still considered to be part of WRIA 10 – Puyallup/White River watershed. Wapato Creek is tidally influenced throughout the LWCHP site and provides a permanent water source required to re-establish much-needed estuarine habitat. The size of the proposed advance mitigation site is well-suited for the re-establishment of multiple habitat types (intertidal mudflat, estuarine emergent wetland, forested wetland, and forested riparian upland). The LWCHP advance mitigation site contains the physical characteristics required to achieve the goals and objectives described in Section 2, and it is the only undeveloped parcel left on lower Wapato Creek.

The LWCHP is a complementary project to other habitat enhancement and fish passage barrier removal projects located upstream within the same Wapato Creek watershed (Figure 3).

The LWCHP also addresses the limiting factors identified in the *Salmon Habitat Limiting Factors Report for the Puyallup River Basin – Water Resource Inventory Area 10* (Kerwin 1999), as well as the restoration recommendations for Wapato Creek identified in the *Commencement Bay Natural Resource Restoration Plan* (Commencement Bay Natural Resource Trustees 1997), as described below.

The limiting factors for Wapato Creek identified in Kerwin (1999) include the following:

- Fish passage;
- Floodplain connectivity;
- Large woody debris/material (LWD/LWM);
- Pools;
- Side (off)-channel habitat;
- Substrate fines;
- Riparian;
- Water quality/quantity; and
- Estuarine habitat.

The recommendations for Wapato Creek restoration in the *Commencement Bay Natural Resource Restoration Plan* (Commencement Bay Natural Resource Trustees 1997) include the following target habitats for salmonid migration and spawning, waterfowl and wildlife use, and furbearing mammals:

- Freshwater channels;
- Wetlands; and
- Riparian corridors.

Based on the above-referenced restoration plans, the on-site physical characteristics to support restoration, and its proximity within the watershed, the LWCHP is the last, best place to build a tidally-influenced stream channel and floodplain wetland mosaic on the Wapato Creek system.

5 Baseline Conditions

Per the requirement (1.c.) set forth in the joint regulatory agency guidance (USACE et al. 2012), this section describes the current baseline conditions for the LWCHP advance mitigation site. The Project site is located approximately 0.46 mile upstream (south) of the mouth of Wapato Creek where it enters into the Blair Waterway (Commencement Bay). Historically, the LWCHP site was a tidally-influenced wetland with intertidal mudflats. The wetlands were converted to agricultural use in the first half of the 20th Century; the site was legally filled in the mid-1960s with dredge material from the expansion of the Blair and Hylebos Waterways and the Wapato Creek channel was rerouted to its present location (GeoEngineers 2010) (see Appendix B for historical aerials of the LWCHP site). Typical impacts to an area used for agriculture include annual plowing or tilling, soil compaction, water diversion or drainage, and oftentimes removal or disturbance to shrub and forested vegetation.

Based on Ecology (2009) guidance, the LWCHP site has a variety of landscape and site constraints related to hydrology, improving water quality, and habitat functions (wildlife and plant species richness). Table 3 presents these constraints and how they will be addressed by the LWCHP in support of improving watershed conditions.

Table 3. Status of Advance Mitigation Site Landscape and Site Constraints

Function	Constraint	How Constraint will be Addressed
Landscape Constraints		
Improving Hydrologic and Water Quality Functions	Stream next to or within the site been severely downcut so the site can no longer receive overbank flooding.	N/A. No downcutting within Wapato Creek adjacent to the project site contributes to lack of overbank flooding.
	Summer low flows significantly reduced through watershed impairments.	N/A. The Project will not address summer low flows.
Improving Habitat Function: Species Richness of Wildlife	Site is completely isolated from other habitats by roads, paved areas, or residential development with >1 dwelling/acre.	The Project is mostly isolated from other habitats as a result of surrounding development. The Project will replace undersized culverts with a full-span bridge which will create a fish and wildlife corridor to access upstream habitat.
	Site has a vegetated buffer too small to provide good habitat (i.e., less than 110 feet wide for more than -75% of the circumference).	Existing vegetated buffers along Wapato Creek are as small as 6 feet on the left bank and consists of invasive grass and blackberry. The Project will relocate Wapato Creek away from roads and install a dense assemblage of native plants to create a wider functioning buffer.
Improving Habitat Function: Species Richness of Plants	Surface waters coming into the site drain agricultural or residential areas (i.e., high nutrient inputs).	The Project will not reduce nutrient loads entering the site from off-site sources; however, creating a densely forested buffer and topographic relief/separation will contribute to reducing elevated nutrient inputs into Wapato Creek from adjacent land use activities (landscaping and residential areas). The significant amount of re-established wetlands and floodplain will provide additional contact surface

Function	Constraint	How Constraint will be Addressed
		and treatment for nutrient loads passing through the Project site.
	Septic systems present within 250 feet of the site.	There are no known septic systems within 250 feet of the site.
Site Constraints		
Improving Hydrologic Functions	Dike or other structure keeps overbank flooding from reaching the site.	The current configuration of Wapato Creek is constructed to prevent overbank flooding. The Project will reconfigure Wapato Creek to create connected floodplains to allow for regular inundation of the Project site.
	Site contains ditches or other conveyance that drain floodwaters too quickly.	The current configuration of Wapato Creek is a straight, ditched, channel, there is a drainage ditch along 12th Street East, on the east side of Wapato Creek, and the culverts that convey Wapato Creek are undersized which increase velocities as the creek enters the Project site. Wapato Creek will be reconfigured into a meandering creek channel to help slow flows and the 12th Street East ditch will be reconfigured to a vegetated filter strip to slow flows and provide stormwater treatment. The proposed bridge will improve flood conveyance caused by the constriction perpetuated by the existing culverts.
	Site contains fill that can be removed to increase overbank storage.	The site contains fill ranging from 3-12 feet that will be removed to increase overbank storage. The Project site will create a substantial increase in the flood storage capacity within the Wapato Creek Base Flood Elevation (BFE) and the Puyallup River Overtopping BFE, an increase of 28.61 acre-feet and 79.78 acre-feet, respectively (GeoEngineers 2020, Port of Tacoma 2021).
Improving Water Quality Functions	Dike or other structure keeps overbank flooding from reaching the site.	The current configuration of Wapato Creek is constructed to prevent overbank flooding. The Project will reconfigure Wapato Creek to create connected floodplains to allow for regular inundation of the Project site.
	On-site soils have been tilled, cultivated or grazed.	The site has been historically filled, the creek ditched and realigned, and was used for agriculture beginning in the early 20th Century. The site is mowed regularly but is no longer used for agriculture. The Project will remove compacted soils and the remaining soils onsite will be roughened and amended.
	Adequate source of water to provide surface ponding that lasts for at least 2 months but less than 10 months.	Wapato Creek, high groundwater table and tidal influence provide an adequate source of water, but Wapato Creek's current configuration does not allow for ponding. The Project will construct floodplain depressions, and combined with the reconfigured Wapato Creek channel and the re-established intertidal estuary, the site will allow for regular

Function	Constraint	How Constraint will be Addressed
		ponding and inundation not currently available onsite.
	Site is mostly without emergent or herbaceous species.	The majority of the existing site is upland area dominated by invasive and noxious weeds. Large portions of the site are dominated by reed canarygrass and other invasive weeds. The Project will remove fill containing root systems and seed banks, and replant the area with native emergent, shrub and tree species.
Improving Habitat Function: Species Richness of Wildlife	Site is constrained by an altered water regime (e.g., dikes, ditches, fill).	Wapato Creek is currently configured as an artificial ditch. The Project will reconfigure Wapato Creek back to as close to its historic channel alignment as possible, remove fill, and reconnect the floodplain and re-establish wetlands/estuary to provide a more natural and functioning ecosystem.
	Site is dominated by aggressive vegetation or cultivated species.	As stated above, large portions of the site are dominated by invasive and noxious weed species. The Project will remove these invasives and replant with a native assemblage of plants.
	Site lacks habitat structures appropriate for the hydrogeomorphic setting.	The site currently lacks habitat structures. The Project will install over 200 LWM structures and add topographic diversity to provide habitat complexity.
Improving Habitat Function: Species Richness of Plants	Site contains high levels of nutrients from past activities such as farming, grazing, or inputs from runoff.	Stormwater runoff will be intercepted by vegetated filter strips and topographic relief/separation constructed as part of the Project. The significant amount of re-established wetlands and floodplain will provide additional contact surface and treatment for nutrient loads passing through the Project site.
	Site is constrained by vegetation where aggressive or cultivated species are dominant.	See above.
	Site is constrained by the lack of nearby wetland that can provide a source of seed for re-colonization.	The Project will re-establish estuarine emergent and palustrine forested wetlands. The site is anticipated to be self-sustaining with native plants, and salt-tolerant seed sources will be available from vegetation growing downstream of the Project area.

Note: N/A = not applicable

5.1 Wapato Creek and Riparian (Buffer) Conditions

Wapato Creek currently enters the LWCHP site through twin, 60-inch-diameter, perched culverts and flows north under 12th Street East. The creek immediately turns 90 degrees to the west and flows parallel with 12th Street East as a channelized roadside ditch. As the creek approaches Alexander Avenue East, it turns another 90 degrees to the north and flows parallel to Alexander Avenue East north, exiting the Project site at State Route (SR) 509. Wapato Creek is tidally influenced throughout the LWCHP site as shown on Figure 4, Existing Conditions. The creek has been constructed into a trapezoidal ditch and in-stream habitat is limited with no structure or

complexity; Wapato Creek is confined, straight, incised and artificial with no accessible floodplain and no connected wetlands.

Wapato Creek is listed on the WDFW and Washington State Department of Natural Resources (DNR) Stream Classification mapping system as Type F, fish-bearing stream (WDFW 2020b, DNR 2020). Wapato Creek is on Ecology's 303(d) list under Category 5 for dissolved oxygen and bacteria, and Category 4C for instream flow (Ecology 2020).

The existing left bank stream buffer for Wapato Creek along 12th Street East is approximately 10 feet wide. The riparian area is dominated by grasses and invasive species. The stream buffer along East Alexander Avenue is approximately 70 feet wide and is also dominated by grasses and invasive species, and has access roads to power poles within 10 feet of Wapato Creek.

Hydrogeology of the LWCHP site was initially evaluated in 2010 and 2018 to monitor surface and groundwater levels and to aid in the development of the proposed Project design. Surface water elevations of Wapato Creek range from approximately +7.5 to +15.0 feet mean lower low water (MLLW), with maximum daily fluctuations of over six feet. The highest surface water levels occur during winter high tides. Groundwater levels are shallowest on the eastern side of the LWCHP site, ranging from approximately +12.0 to +18.0 feet MLLW, and deeper (approximately +10.0 to +12.5 feet MLLW) in the center portion of the site, just east of Wapato Creek's current configuration. Groundwater exhibits significant seasonal fluctuations (five feet or more), but very little daily fluctuation with tidal variation (no more than 0.15 foot in any location within the LWCHP site) (GeoEngineers 2010 and 2018). *Note: for purposes of this AMP, MLLW elevations are referenced to the fixed Port of Tacoma Vertical Datum (PoTVD). The elevation 0 feet MLLW in PoTVD is equal to -2.67 feet North American Vertical Datum of 1988 (NAVD88), and -0.28 foot MLLW in the tidal datum (epoch 1983-2001).*

Salinity testing conducted by GeoEngineers on March 12, 2020 identified a tidally-influenced saltwater wedge up to the existing 12th Street East culverts. Salinity readings were taken approximately 40 feet downstream (north) of the 12th Street East culverts' outlet during a high tide of +13.0 feet MLLW at approximately 7:00 AM on March 12, 2020. The observed salinities were >20.0 parts-per-thousand (ppt) within 24 inches of the water surface. The average salinity for Puget Sound (Commencement Bay) is 28-30 ppt (Kerwin 1999), which indicates the LWCHP site has the potential to support estuarine habitat once restoration activities are complete. Table 4 identifies observed salinity measurements taken during the testing event on March 12, 2020.

Table 4. Salinity Readings Downstream of Existing Culverts

Water Depth (feet)	Salinity (ppt)
0.5	0.30
1.0	0.42
1.5	0.80
1.8	2.20
2.0	25.09
3.0	28.28

Additional salinity data were collected after the draft AMP was submitted to the regulatory agencies to further evaluate the influence of tidal waters. Salinity data were collected from September to December 2020 at multiple elevations and locations within and near the LWCHP

site and is documented in the Salinity Monitoring Report (GeoEngineers 2021a). Salinity was observed at elevation +13 feet MLLW in concentrations high enough that it may negatively affect the establishment of palustrine forested wetland at elevation +13 feet MLLW; however, the data indicate the salinity concentrations will support salt-tolerant vegetation to elevation +13 feet MLLW. The data appear to confirm the lower limits of the proposed estuarine emergent vegetation should remain at +11 feet MLLW. Based on the additional data collected, the expected frequency and duration of oligohaline conditions (0.5 - <5.0 ppt) above elevation +13.5 feet MLLW is not expected to exert a controlling force on the establishment of salt-tolerant vegetation at the site (GeoEngineers 2021a). A transitional planting zone between elevations +13 and +14 feet MLLW with a mix of salt and freshwater plant species will ensure plant survival and the ability to adapt to varying salinities and potential changing conditions. Salt-tolerant vegetation occurs at low-bank elevation, including saltgrass (*Distichlis spicata*) and seaside arrowgrass (*Triglochin maritima*). The presence of salt-tolerant vegetation in the low-bank elevation and salt-sensitive vegetation (reed canarygrass [*Phalaris arundinacea*]) at higher bank elevations also indicates that a saltwater wedge forms during high tides, in which denser saltwater is situated below the freshwater originating from upstream.

5.2 Wetland Conditions

Several small, isolated, non-jurisdictional depressions that display wetland characteristics are located in the northern and eastern portions of the proposed Project site. These depressions were determined non-jurisdictional by the USACE in 2008, 2013, and again in 2020, and by Ecology in 2011 and again in 2020 (see Appendix C, Current and Previous Wetland Jurisdictional Determinations). The City of Tacoma also indicated in 2009 that the wetlands are, by definition, artificial wetlands, and will complete an updated jurisdictional determination during the 2020 permitting process (see Appendix C).

5.2.1 Wetland Vegetation

The depressional areas contain hydrophytic vegetation consistent with palustrine emergent wetlands. The majority of the vegetation within the depressions is dominated by reed canarygrass and redtop (*Agrostis gigantea*), both introduced grass species that tend to become invasive. Native rushes (*Juncus* spp.) and hardhack (*Spirea douglasii*) were also observed during previous site investigations (Grette Associates 2008).

5.2.2 Wetland Hydrology

The depressional areas displayed hydrology consistent with depressional wetlands during previous site investigations (Grette Associates 2008). Direct precipitation and surface water runoff appeared to be the primary sources of water to the depressions. Observations of hydrology indicators include ponding (inundation), water marks, water-stained leaves, and oxidized rhizospheres.

Groundwater data were collected between September 2016 and August 2020 to identify the proposed design elevations that would support wetland hydrology. These data were supplemented with groundwater modeling later in 2020 to confirm the original design would support wetland hydrology to elevation +16 feet MLLW. The modeling results indicate that groundwater occurred up to an elevation of between +13 and +14 feet MLLW in the eastern portion of the site, approximately +12 feet MLLW in the central portion of the site, and below +12 feet MLLW in the

western portion of the site (GeoEngineers 2021b). Based on these results, design elevations for the wetland areas were lowered to between +13 and +15 feet MLLW to increase the likelihood that the proposed wetland areas would maintain positive wetland hydrology (GeoEngineers 2021b).

5.2.3 Wetland Soils

Soils throughout the LWCHP site are mapped as fill material. The surface layers of soil are consistent with the mapped series (Grette Associates 2008). Soils consist of a layer of fill (generally 3-6 feet thick) that overlies native soils consisting of silts, silty sands, and sands; occasionally an organic horizon separates the fill from the underlying native soils (see Figure 5) (GeoEngineers 2010). Hydric soil indicators observed within the depressional areas during previous site investigations include redox dark surface (F6), with low-chroma soil matrix colors and distinct mottles within 6-10 inches of the surface (Grette Associates 2008).

5.3 Upland Vegetation

Existing vegetation within the upland area of the Project site includes several existing small, isolated forested areas, primarily composed of black cottonwood (*Populus balsamifera*) with some other native tree species scattered throughout. The remaining portions of the upland area are dominated by invasive and noxious weed species including reed canarygrass, Himalayan blackberry (*Rubus armeniacus*), Scotch broom (*Cytisus scoparius*), English ivy (*Hedera helix*), and poison hemlock (*Conium maculatum*). Soils in the upland area consist of sandy silt and silty sand, which is consistent with the dredged fill material that was placed on the Project site and is estimated to be approximately 4-6 feet thick in most of the upland area and approximately 6-12 feet thick in the location of the historic creek channel alignment (Figure 5 and GeoEngineers 2010).

5.4 Fish and Wildlife Use

Based on its proximity to the Puyallup River and Hylebos Creek, and its location within the range of tidal influence, Wapato Creek has the potential to support rearing and foraging habitat for resident and migratory fish, including salmonids. Puget Sound Distinct Population Segment (DPS) steelhead trout (*Oncorhynchus mykiss*) have been documented in Wapato Creek (WDFW 2020b); however, National Marine Fisheries Service (NMFS) is not aware of documented steelhead use within Wapato Creek during at least the past 20 years and does not consider Wapato Creek to provide suitable habitat for steelhead (Fisher 2013 pers. comm. 16 April). Coho (*O. kisutch*) and fall chum (*O. keta*) salmon, have also been documented in Wapato Creek (WDFW 2020b), as well as sea-run coastal cutthroat trout (*O. clarki clarki*) and several other non-salmonid resident and migratory fish species. Salmonid species have been found to benefit from foraging and rearing opportunities found in estuarine habitats (Koski 2009, Simenstad et al. 1982), including freshwater tidal wetlands on non-natal streams nearly one mile from the main river channel (Levings et al. 1995).

WDFW conducted an assessment on October 1, 2019 on the twin, perched culverts at the 12th Street East crossing with Wapato Creek. The Level A Culvert Assessment Report identified the culverts as a partial barrier for chum, coho, steelhead, sea-run coastal cutthroat and resident trout (WDFW 2019). The Barrier Priority Index Report from the same 2019 assessment estimated the

potential habitat gain for rearing habitat for coho, steelhead, sea-run coastal cutthroat if the barrier was removed was over 27,600 square meters (WDFW 2019).

Several habitat factors in the Wapato Creek basin are identified as limiting naturally producing self-sustaining runs of salmonids (Kerwin 1999). Table 5 presents these habitat limiting factors and how they will be addressed by the advance mitigation project, as required by the joint regulatory agency guidance (1.e.) (USACE et al. 2012).

Table 5. Wapato Creek Salmon Habitat Limiting Factors

Limiting Factor	How Limiting Factor will be Addressed
Fish Passage	The partial fish passage barrier on Wapato Creek (twin perched culverts under 12th Street East) will be replaced with a full-span bridge to provide unimpeded access to upstream habitat.
Floodplain Connectivity	The LWCHP will restore floodplain connectivity by removing the fill that was placed during dredge operations and when Wapato Creek was diverted from its historical channel. This is anticipated to increase flooding frequency in the floodplain.
LWD/LWM	The LWCHP will install approximately 230 LWM structures within and adjacent to the proposed channels and throughout the floodplain.
Pools	The LWCHP will install LWM structures within the realigned Wapato Creek channel with the intent of forming scour pools.
Side (Off)-Channel Habitat	The LWCHP will maintain a portion of the existing Wapato Creek channel along East Alexander Avenue as a side channel and various side channels and braided channels will be present at different tidal elevations.
Substrate Fines	Not applicable. The low-gradient floodplain nature of the Wapato Creek reach where the proposed Project is located is not conducive to support gravels and is not appropriate for spawning habitat. Substrate fines are an inherent feature of this system and are not a limiting factor on the LWCHP site.
Riparian	The LWCHP will greatly improve riparian conditions by planting native emergent, groundcover, shrub, and forested vegetation communities.
Water Quality	The LWCHP will improve water quality conditions by increasing the frequency of overbank flooding and surface water contact time with floodplain vegetation thereby promoting pollutant removal. In addition, the LWCHP will improve water temperature and dissolved oxygen conditions by providing additional shading to Wapato Creek.
Water Quantity	Not applicable. The LWCHP does not involve measures to increase water quantities in Wapato Creek.
Estuarine	The LWCHP will remove fill from previous dredge operations and re-establish 6.27 acres of intertidal mudflats and estuarine emergent wetlands.

Wildlife use is extremely limited due to surrounding land uses and lack of habitat complexity within the existing LWCHP site. An established red-tailed hawk (*Buteo jamaicensis*) nest is known to occur in one of the existing black cottonwood trees, and great blue herons (*Ardea herodias*) utilize the Wapato Creek channel for hunting prey. Waterfowl and shorebirds have been observed utilizing Wapato Creek. Coyotes (*Canis latrans*) and several small mammals have also been observed by Port Maintenance personnel during vegetation maintenance activities. Beaver activity was observed in Wapato Creek in 2019. WDFW does not list any Priority Habitats or Species besides the fish species discussed above (WDFW 2020a).

6 Mitigation Work Plan

The LWCHP advance mitigation site will increase functions, values and areal extent of wetland and fish habitat within the Wapato Creek estuary. The LWCHP restoration actions will increase the water quality, hydrologic and habitat functions of the site through the re-establishment of historically lost, locally significant habitat types. The aquatic resources associated with the LWCHP include the following Cowardin Classes of Wetland and Deepwater Habitats in the lower Wapato Creek watershed: riverine tidal streambed cobble-gravel/mud (Wapato Creek); estuarine intertidal unconsolidated mud (intertidal mudflats); estuarine intertidal emergent persistent wetlands (estuarine emergent wetlands or EEM); and palustrine forested evergreen/deciduous wetlands (forested wetlands or PFO) (Cowardin et al. 1979). For purposes of this AMP, the Cowardin classification for EEM will include both saltwater and freshwater tidal fringe, as defined by the Hydrogeomorphic (HGM) classification in Ecology's Wetland Rating System for Western Washington (2014); see Section 12 for additional discussion. In addition, forested riparian upland (UPL) habitat will be re-established and enhanced. The re-established habitats of the LWCHP have been designed to function as synergistic components of a single, naturally functioning ecosystem providing the maximum functional lift possible to wetlands, fish habitat, wildlife, and the floodplain as a whole. The Port chose these restoration actions for this location instead of the minimum standard for replacing isolated Category III wetlands with no fish habitat. The re-establishment of these habitat types will be completed in advance of other development projects with potential impacts to wetlands or fish habitat.

The proposed Project includes two primary habitat elements:

- Fish passage improvement through the replacement of two undersized, perched culverts at the Wapato Creek crossing at 12th Street East with a full-span bridge; and
- Re-establishment of wetland and fish habitat through relocation of Wapato Creek and construct a diverse complex of associated floodplain and wetland habitats historically present in the Commencement Bay intertidal mudflats and Puyallup River estuary.

In addition to improving fish passage, the proposed bridge will improve flood conveyance and reduce the impacts of habitat fragmentation caused by the constriction perpetuated by the existing culverts. This will create an aquatic and riparian fish and wildlife corridor that extends from upstream of the Project area, through the LWCHP site and into the downstream Wapato Creek corridor. Correcting fish passage barriers is an important step in the recovery of anadromous fish species.

The re-establishment of wetland and fish habitat will be achieved through a variety of design elements that will provide habitat diversity, complexity and interspersion. The design includes creation of sinuous edge habitat, as well as intermixed hummock and wetland habitat that is essential to re-establishing habitat interspersion and complexity in lower Wapato Creek. These habitat features have been designed to function as an interconnected ecosystem unit that provides key habitat functions for all life stages of avian, wildlife, and fish species, especially anadromous salmonids. Intertidal stream channels, mudflats, estuarine emergent wetlands, as well as freshwater forested wetlands and forested riparian habitats provide essential fish and wildlife functions such as foraging opportunities, refuge, osmoregulation, flood protection and food web interconnections. These habitats also work together to provide key ecosystem services such as flood attenuation, water quality functions, sediment sorting, and biodiversity. The design has focused on re-

establishment of critical habitat functions and features as close to historic, pre-disturbance locations and conditions as possible within this highly developed urban/industrial location.

The re-established habitats listed above are designed to function as complementary components of a single, naturally functioning ecosystem providing substantial habitat functional lift. The different habitat types, including the tidal stream channel and mudflats, are designed as individual components of a larger mosaic of locally important aquatic resource habitats. The mosaic is designed to allow natural dynamic physical processes to adjust the habitat types over time based on changing climate and creek conditions. The proposed Project site is not intended to be static and guarantee specific amounts of specific types of habitat. Rather, the site will be dynamic and designed to adapt and mature into a natural, self-sustaining wetland and stream complex with approximately 10.02 acres of creditable area (wetland/aquatic resource re-establishment and/or forested riparian upland enhancement), and approximately 8.50 acres of non-creditable area, of which 7.59 acres is non-creditable on-site buffer. The proposed Project will be achieved through design and implementation of the proposed construction, site protection, monitoring, maintenance, and stewardship. The LWCHP will increase the potential for successful development of a larger sustainable ecosystem in an area that otherwise is devoid of wetlands and has limited opportunities for functioning fish and wildlife habitat. The LWCHP will generate advance mitigation credits for wetlands and fish habitat. Per the requirement set forth in the joint regulatory guidance (1.d.), Table 6 provides the proposed restoration actions and the associated acreages (creditable and non-creditable) (USACE et al. 2012). Figure 6 demonstrates the proposed habitat types and their associated creditable and non-creditable acreages.

Table 6. Proposed Restoration Action and Acreages[1,2]

Restoration Action	Habitat Type	Creditable Area (acres)	Non-Creditable Area (acres)	Total Area (acres)
Re-establishment	Wapato Creek Channel/ Intertidal Mudflat	2.23	0.02	2.25
	EEM	4.04	-	4.04
	PFO	2.91	-	2.91
Rehabilitation	Wapato Creek Channel/ Intertidal Mudflat	-	0.18	0.18
	EEM	-	0.05	0.05
Enhancement	Forested Riparian Upland	0.84	7.40	8.24
	ROW/Vegetated Filter Strip[3]	-	0.85	0.85
	TOTAL:	**10.02**	**8.50**	**18.52**

[1] Acreages listed here are preliminary estimates. The Port's phased mitigation plan approach will determine credits generated for each wetland type after the Year 1 monitoring effort. See Section 7.3 for more detail.

[2] The total on-site acreage for the Project is 17.67 acres. An off-site right-of-way (ROW) (0.85 acre) will be transferred to the City of Fife. On-site non-creditable buffer area is approximately 7.59 acres, excluding approximately 0.05 acre of TPU access pads (with an 0.01 acre rounding error).

[3] ROW category also includes TPU access pads as non-creditable area.

6.1 Geographic Boundaries

The LWCHP advance mitigation site is located on 18.52 acres of triangularly-shaped Port-owned land approximately 0.46 mile south from the mouth of Wapato Creek where it enters into the Blair Waterway (Commencement Bay). The LWCHP site consists of two five tax parcels (Habitat Site: 03200130055, 0320013157, and 0320013158, and 0320017003; Disposal Site: 0320011117) in the City of Fife and the City of Tacoma, Washington within Township 20 North, Range 03 East, Section 01, Willamette Meridian (Figure 1).

The site is bordered to the north by SR 509 and Port industrial property (Port Parcel 15, currently a truck-staging queue and import vehicle storage facility); to the east by the Prologis Park Tacoma industrial warehouse facility; to the west by East Alexander Avenue and Progress Rail Services (locomotive maintenance facility); and to the south by 12th Street East, the Omega Morgan industrial facility, and Tribal Trust properties including private residences.

6.2 Design Elements (Construction Methods)

The proposed design will include the following elements:

- Replacement of twin undersized, 60-inch diameter, perched culverts with an approximately 50-foot wide full-span bridge;
- Realign and increase the length of Wapato Creek, including additional retained off-channel habitat within the existing Wapato Creek channel alignment; and
- Re-establish broad floodplain corridor that includes an interconnected mosaic of intertidal mudflats, estuarine emergent wetlands, palustrine forested wetlands, and enhanced forested riparian upland that surrounds the site.

6.2.1 Timing and Sequencing

Restoration work at the LWCHP will be conducted over a two-year period. Figures 7-12 provide Project details, including the culvert removal and bridge installation, the grading plan and the planting plan.

The first year of construction (expected to be 2021) will include re-grading the site and replacing the culverts with a full-span bridge. Wapato Creek will be rerouted through the site and 178 LWM structures, plus 29 rootwads and 23 standing snags, will be installed throughout the estuarine and forested wetlands areas. Portions of the existing Wapato Creek channel alignment will be filled, and a vegetated filter strip will be constructed along 12th Street East to the east and west of the new Wapato Creek bridge. The Project site will be stabilized with wetland and upland seed mixes and/or plugs and erosion control blankets, as needed. The Project site will be observed until the following year to monitor post-construction hydrology, including water depth, inundation and salinity levels and durations to confirm planting zones.

The second year of construction (expected to be 2022) will include installing the temporary irrigation system and all of the plants according to the planting plan (Figure 10B) and any additional salt-tolerant emergent vegetation (e.g., plugs, broadcast and/drilled seed) between +11.0 and +13.0 feet MLLW and freshwater emergent species installed (e.g., plugs, broadcast and/or drilled seed) between +13.0 and +15.0 feet MLLW. This plant installation work for the second

year of construction is expected to be bid in early 2022 to allow time for the contractor to order and/or contract to grow the plants before the dormant planting season in the Fall of 2022.

The in-water work will occur during the approved in-water work window for all work below the High Tide Line (HTL) / Ordinary High Water Mark (OHWM) of the active Wapato Creek channel. The active Wapato Creek channel is the channel that actively conveys Wapato Creek from upstream of the Project to downstream of the Project. In-water work generally includes culvert replacement/bridge construction work, connection/diversion of Wapato Creek into the new stream channel, and mudflat construction. Work areas may be isolated from the active channel by use of coffer dams, super sacks, or similar devices. Planting may occur at any time above the tidal water elevation.

A general estimate of construction activities and sequencing for the Wapato Creek 12th Street East Bridge and the Wapato Creek Wetland Restoration work is provided below. This may be revised based on the contractor's means and methods, work sequencing, and stream bypass/exclusion/diversion plans.

6.2.1.1 Construction Sequencing for Wapato Creek 12th Street East Culvert Replacement

1. Ensure copies of all permits and conditions from local, state and federal agencies are present on-site for the duration of the work.
2. Hold a pre-construction meeting with the Port of Tacoma, City of Tacoma, and City of Fife and applicable utility companies.
3. Establish clearing limits and install silt fence, sediment and erosion control systems, and high visibility perimeter fence.
4. Install construction entrance and staging area.
5. Locate, relocate or protect existing utilities within Project area in coordination with utility companies.
6. Close the 12th Street East roadway during bridge replacement construction and/or implement the traffic control plan prepared for the Project as directed by the City of Fife.
7. Isolate the work area with cofferdams upstream and downstream and install temporary flow diversion system sufficient to carry flow and any fish around the work area to a point downstream (when necessary based on the contractor's means and methods, work sequencing, and stream bypass/exclusion/diversion plans.).
8. Prior to or during the dewatering of the work area, remove fish per WSDOT Fish Exclusion Protocols and Standards as well as conditions from the WDFW Hydraulic Project Approval (HPA) using qualified professionals.
9. Excavate roadway and roadway embankment. Tracked excavators, dump trucks and other heavy equipment will be used.
10. Remove and dispose of existing culverts (when necessary based on the contractor's means and methods, work sequencing and stream bypass/exclusion/diversion plans.). Tracked excavators, dump trucks and other heavy equipment will be used.
11. Complete grading for finished streambed elevation under bridge and install streambed material at the 12th Street East crossing location. Tracked excavators and small construction equipment such as skid-steers and mini-excavators will be used.
12. The Port will provide 2 days advance notice to WDFW to inspect the placed streambed material within the bridge footprint (bridge stream channel). If the bridge stream channel is not inspected within 5 business days, it will be considered approved.

13. Once new streambed material is approved, creek will be reconnected through new channel under bridge.
14. Install concrete-filled, steel piles per geotechnical engineer's findings and recommendations. Tracked drill rig, dump trucks and other heavy equipment will be used.
15. Form, install reinforcing steel, and pour concrete for abutment caps over pile and wingwalls. Concrete trucks, pump trucks and other construction equipment will be used.
16. Backfill roadway subgrade and wingwalls. Tracked excavators, dump trucks and other heavy equipment will be used.
17. Set precast concrete slab elements for bridge. Cranes and other construction equipment will be used.
18. Form, install reinforcing steel and pour concrete for bridge deck. Concrete trucks, pump trucks and other construction equipment will be used.
19. Form, install reinforcing steel and pour concrete for approach slabs. Concrete trucks, pump trucks and other construction equipment will be used.
20. Construct roadway subgrade and finished roadway. Tracked excavators, dump trucks and other heavy equipment will be used.
21. Form, install reinforcing steel and pour concrete for bridge parapets. Concrete trucks, pump trucks and other construction equipment will be used.
22. Reopen 12th Street East.

6.2.1.2 Construction Sequencing for Wapato Creek and Wetland Restoration

1. Ensure copies of all permits and conditions from local, state and federal agencies are present on-site for the duration of the work.
2. Hold a pre-construction meeting with the Port of Tacoma, City of Tacoma, and City of Fife and applicable utility companies.
3. Establish clearing limits and install silt fence, sediment and erosion control systems and high visibility perimeter fence.
4. Install construction entrance and staging area.
5. Locate, relocate or protect existing utilities within Project area in coordination with utility companies.
6. Clear and grub areas designated for excavation and construction.
7. Conduct rough grading leaving berms of material to isolate grading activities from the existing stream channel. Tracked excavators, dump trucks and other heavy equipment will be used. Stockpile material to be used to fill the old Wapato Creek area. Dispose of excess material at the Disposal site.
8. Pump any turbid water collecting in excavated areas to a temporary infiltration area on the south side of the Project site or the vegetated swale along the Disposal site or Baker tanks located within the staging areas. This water will not be discharged into Wapato Creek, Fife Ditch or the 12th Street Ditch without first obtaining permits and conducting any necessary settling, treatment and sampling.
9. Conduct finish grading of Project site and new stream channel per grading plan (except stockpile and staging areas). Tracked excavators, dump trucks and other heavy equipment will be used.
10. Install LWM and streambed material.
11. Amend subsoil in all areas at elevation +11 feet MLLW and above, excluding the areas with existing canopy, with 4 inches of wood chips tilled to a depth of 18 inches.

12. Install estuary emergent seed and erosion control fabric (jute mat) from +11 to +13 feet MLLW and 6 inches of bioretention mix above +11 feet MLLW, excluding the areas with existing canopy. Seed wetland and upland areas per vegetation plan. Install 2 inches of bioretention mix over existing soil in the supplemental understory planting zone (i.e., areas with existing canopy).
13. Remove temporary sediment and erosion control measures associated with the internal site, new stream channel or phased work areas.
14. Re-direct Wapato Creek into the new stream channel by removing berms in accordance with WDFW HPA.
15. Fill in the old Wapato Creek channel and 12th Street East ditch and create a vegetated filter strip to elevations shown in the plan set and in accordance with WDFW HPA. Remove staging area and conduct finish grading, install LWM, soil amendment, and seed staging and stockpile areas per vegetation plan.
16. Install temporary, permanent and final stabilization where appropriate leaving construction access for landscape contractor.
17. Observe salinity, water levels, inundation depth and durations across new Project site topography and make adjustments to the planting plan and planting schedule accordingly.
18. Install vegetation per the final planting plan and final planting schedule during the dormant season (October through March following final grading).
19. Install and connect temporary irrigation for forested wetland and upland areas per irrigation plans. Operate irrigation for the first 2 years during summer growing season (approximately June 1 to September 30), and then remove.
20. Remove any remaining temporary erosion and sediment control (TESC) features from the Project area after the site is stabilized.
21. Perform as-built survey and submit to Port for review and approval.

6.2.2 Erosion and Sediment Control Measures

Due to the size of the LWCHP (greater than one acre), the Project will require a Construction Stormwater General Permit (CSGP) issued by Ecology. The CSGP requires the Permittee to create and implement a Stormwater Pollution Prevention Plan (SWPPP) which identifies Best Management Practices (BMPs) to prevent erosion and sediment-laden water from discharging to Waters of the U.S. The SWPPP will be a living document and will be updated based on site conditions and weather events.

The Project will be designed to comply with the latest version of Ecology's Stormwater Management Manual for Western Washington (currently 2019). Erosion and Sediment Control (ESC) measures will be implemented prior to any ground-disturbing activities and must be maintained through the entirety of the Project until the site is permanently stabilized. ESC BMPs may include, but are not limited to, the following:

Table 7. ESC Construction BMPs

Construction Source Control BMPs	Construction Runoff BMPs
BMP C101: Preserving Natural Vegetation	BMP C201: Grass-Lined Channels
BMP C102: Buffer Zones	BMP C220: Inlet Protection
BMP C103: High-Visibility Fence	BMP C233: Silt Fence
BMP C105: Stabilized Construction Entrance	BMP C234: Vegetated Strip
BMP C120: Temporary and Permanent Seeding	BMP C235: Wattles
BMP C121: Mulching	BMP C240: Sediment Trap
BMP C122: Nets and Blankets	BMP C251: Construction Stormwater Filtration
BMP C125: Topsoiling/Composting	
BMP C140: Dust Control	
BMP C150: Materials on Hand	
BMP C153: Material Delivery, Storage, and Containment	
BMP C160: Certified Erosion and Sediment Control Lead	

6.2.3 Grading Plan

The majority of the grading for the LWCHP will be associated with channel realignment and reconnecting the floodplain. Currently, elevations at the LWCHP site average around +20.0 feet MLLW (outside the existing Wapato Creek channel). After grading activities, site elevations will range from +8.0 to +25.0 feet MLLW to support the new creek channel alignment as well as provide microtopographic complexity for the desired vegetation communities. Table 8 describes the different grading activities associated with the LWCHP. All quantities/acreages are approximate until the design is finalized. The Project Update Memo (Port of Tacoma, 2021) describes design changes that occurred since the original joint aquatic resources permit application (JARPA) and potential refinements prior to construction.

Table 8. Grading Activities for the LCWHP

Activity	Amount of Material (Cubic Yards)	Impacted Area (Square Feet or Acres)
Excavation for culvert removal / bridge construction	500 CY	4,220 SF (0.10 acre)
Fill for bridge construction	225 CY for structural fill	4,220 SF (0.10 acre)
Fill for streambed material	495 CY for bridge 7,100 CY for new creek channel	1,463 SF for bridge 2.43 acres for new creek channel
Excavation for new Wapato Creek channel/floodplain and wetland and buffer restoration	190,000 CY	16.95 acres
Fill for existing Wapato Creek channel conversion to vegetated filter strip	9,200 CY	24,000 SF (0.55 acre)
Fill for existing Wapato Creek channel conversion to intertidal mudflat	130 CY	3,664 SF (0.08 acre)
Fill for 12th Street East Ditch conversion to vegetated swale	2,550 CY	11,400 SF (0.26 acre)
Fill to restore wetlands/buffers (bioretention mix and mulch)	12,400 CY bioretention mix 12,200 CY soil amendment 400 CY mulch	15.3 acres 16 acres of jute mat
LWM and snag placement	178 pieces LWM 29 rootwads 23 standing snags	LWM and snags will be sized and placed per plan

Note: CY = cubic yards, SF = square feet

6.2.4 Soil Management

All fill material to be placed onsite will come from the on-site soils excavated to create the restored creek channel alignment and wetlands, or from LWM, topsoil/bioretention mix, mulch, structural fill, and streambed material from approved sources. Excavated soils will be re-used on the Project site to fill the abandoned channel and the ditch along 12th Street East to create vegetated filter strips/swales, to create microtopography (hummocks), to create raised buffers to separate off-site topography, and to create intertidal mudflat/ off-channel habitat along East Alexander Avenue in the existing section of the creek channel; excess material not reused onsite will be transported off-road and placed on an adjacent Port property (tax parcel no. 0320011117) as shown on Sheet 4 of the JARPA/Permit Drawings or another approved location.

On-site subsoils at elevation +11 feet MLLW and above, with the exception of the areas with existing canopy, will be amended by placing 4 inches of wood chips tilled to a depth of 18 inches, and recompacted to 85 percent. The wood chip amended subsoil will then be topped with 6 inches of bioretention mix and compacted to 85 percent. The supplemental understory planting zone (i.e., the area underneath the existing tree canopy) will have 2 inches of bioretention mix placed over the existing soil. Amending the soils and placing bioretention mix will provide a cap over any existing non-native seedbank and make it less hospitable to invasive weed seed deposits.

6.2.5 Wapato Creek Channel and Mudflat

The proposed Project will increase the length of Wapato Creek from 1,040 linear feet (LF) to approximately 1,875 LF, with an additional 350 LF of retained off-channel habitat in the existing Wapato Creek channel. The creek channel will be reconfigured from a straight, confined, incised, and artificially-ditched trapezoidal channel with no habitat structure, complexity, floodplain, or connected wetlands to a meandering intertidal creek channel/estuary complex with re-established wetlands, floodplain, and restored habitat diversity, complexity and interspersion. The floodplain reconnection is anticipated to create an intertidal mudflat up to +11.0 feet MLLW. The restored Wapato Creek channel and its associated intertidal mudflat are components of the re-established wetland complex, and will be approximately 2.25 acres (of which 0.02 acre is non-creditable). The proposed sinuous Wapato Creek channel will also include streambed substrate (approximately 7,100 CY) and LWM in high energy areas to provide opportunity for juvenile salmonid refuge from predators and high flows and provide initial stability as the site becomes established. The reconfigured Wapato Creek channel and its associated intertidal mudflat will range in elevation from +8.0 to +11.0 feet MLLW, with a thalweg provided throughout the channel to provide additional habitat complexity at low water elevations. The reconfigured Wapato Creek channel will be allowed to change naturally, potentially creating backchannels, tidal channels, microtopography, sedimentation/accretion, erosion, cut-banks, benches and other hydraulically-driven habitat features. The creek is not designed to be armored or confined to a specific area and orientation; however, erosion or sloughing that prevents water from properly conveying through the site and/or creates a fish barrier will be addressed as part of adaptive management/contingency measures (Section 12).

Approximately 713 LF of the existing straightened and simplified Wapato Creek channel will be filled along 12th Street East and will function as a vegetated filter strip to intercept road stormwater runoff before entering the habitat site. The remaining portions of Wapato Creek along East Alexander Avenue (approximately 350 LF) will tie into the proposed re-established Wapato Creek channel as off-channel habitat. Approximately 117 LF of the 350 LF will be partially filled to act as intertidal mudflat and estuarine emergent wetland to the south.

6.2.6 Large Woody Material

Approximately 230 pieces of LWM will be placed throughout the LWCHP site including in-channel, wetland, and forested riparian upland structures. LWM will be Douglas-fir, western red-cedar, or other approved coniferous species. LWM structure design details are available in the JARPA drawings.

LWM structures in the LWCHP design include the following:

- Bank logs, root wads, fallen trees (163)
- Revetment logs (44)
- Snags (23)

In-stream LWM is intended to provide additional habitat complexity as well as channel and bank stability. Each of these LWM structures contains root wads, and when installed within the channel, will be exposed to flow. Over time, scour around these structures is anticipated to form pools which will enhance in-stream rearing and refuge habitat for juvenile and adult fish. In key areas within the realigned Wapato Creek channel, a combination of bank logs, revetment logs, and root wads

will be formed into a LWM matrix and backfilled with streambed gravel to provide additional channel and bank stability.

LWM structures outside the realigned Wapato Creek channel will include wetland structures and forested riparian upland structures, including standing snags. These LWM structures will provide hydraulic residence, support hydraulic complexity and the natural formation of topographic complexity, as well as provide essential wildlife forage and shelter opportunities. In addition, any trees that have to be removed during grading will be stockpiled and may be used to create brush piles in the PFO and/or UPL for additional habitat complexity and small mammal refuge.

6.2.7 Culvert Removal/Bridge Replacement

The LWCHP will replace twin, undersized, 60-inch diameter perched culverts with a full-span bridge at the 12th Street East crossing to provide unimpeded fish passage to the upstream reach of Wapato Creek. The proposed bridge will also improve flood conveyance and reduce the impacts of habitat fragmentation caused by the constriction perpetuated by the existing culverts. This will create an aquatic and riparian fish and wildlife corridor that extends from upstream of the proposed Project, through the LWCHP advance mitigation site and into the downstream Wapato Creek corridor. Correcting fish passage barriers is an important step in the recovery of anadromous fish populations.

The current culvert structure consists of two perched concrete culverts, with a riprap headwall upstream and a concrete headwall downstream. The culverts are approximately 45 feet long and estimated to be a 33 percent fish passage barrier (WDFW 2019). The proposed new bridge will be a full-span bridge that is approximately 41 feet (perpendicular to the Wapato Creek channel) by 50 feet (parallel to flow/Wapato Creek channel) supported by twelve vibratory driven 24 inch diameter concrete-filled steel tubes/piles. Removing the culverts will not only remove the partial fish barrier (elevation drop), it will also reduce flow velocities through the passage, improve flood conveyance and estuary connectivity, and remove the long, dark tunnel that fish currently have to travel through to access upstream habitat.

The means and methods for the culvert removal/bridge replacement will be the Contractor's responsibility; however, once the culverts are removed, the streambed will be excavated to the appropriate elevation and streambed material will be installed within the bridge footprint. The streambed material will consist of a coarser mix of cobbles, gravel and sand. The streambed material will be approximately three feet thick, with a one-foot deep thalweg. This will provide additional channel and bank stability, as well as ensure fish passage year-round, including summer low-flow and winter high-tide, high-flow events.

6.2.8 Estuarine Emergent Wetland

The estuarine emergent wetland areas proposed for the LWCHP site will provide sinuous edge habitat along the Wapato Creek realignment and maximize the interspersion between the creek channel, the intertidal mudflats and higher wetland elevations within the proposed Project site. The approximately 4.04 acres of estuarine emergent wetlands will improve water quality as well as increase forage opportunities for anadromous and resident fish and wildlife species.

The estuarine emergent wetland re-establishment design was based on tidal elevations observed at the LWCHP site. The estuarine emergent wetlands are anticipated to transition from saltwater tidal fringe to freshwater tidal fringe, as defined by Ecology's HGM classification in the Wetland Rating

System for Western Washington (2014). Anticipated saltwater and freshwater tidal fringe conditions are discussed further in Section 12. The estuarine emergent wetland vegetation zone includes species with a range of salt tolerances to allow more salt-tolerant vegetation to establish at lower elevations with higher salinities, and less salt-tolerant vegetation to establish in areas with lower salinities. Elevations from approximately +11.0 feet MLLW to approximately +13.0 feet MLLW are estimated to have enough inundation frequency and duration to support salt-tolerant plant species. Emergent species tolerant of periodic freshwater inundation will be installed between +13.0 and +15.0 feet MLLW. These elevations were selected based on the groundwater data and known tidal elevations and salinity measurements collected at the LWCHP site to provide confidence that wetland conditions will be achieved. Figure 10A includes the Phase 1 planting plan for the emergent seed mix. Figure 10B includes the Phase 2 planting plan for the estuarine emergent wetland plant zones. Tables 9 and 10 provide seed mixes proposed for the LWCHP wetlands. These seed mixes may be further refined/updated based on site conditions and/or seed availability.

Table 9. Emergent Seed Mix

Common Name	Scientific Name	Wetland Status[1]
Lyndby's Sedge	*Carex lyngbyei*	OBL
Slough Sedge	*Carex obnupta*	OBL
Awlfruited Sedge	*Carex stipata*	OBL
Creeping Spikerush	*Eleocharis palustris*	OBL
Tapered Rush	*Juncus acuminatus*	OBL
Baltic Rush	*Juncus balticus*	FACW
Daggerleaf Rush	*Juncus ensifolius*	FACW
Hardstem Bulrush	*Scirpus acutus*	OBL
Tule	*Scirpus americanus*	OBL
Saltmarsh Bulrush	*Scirpus maritimus*	OBL

[1]Wetland indicator status based on USACE (2018).

Table 10. Lower Seed Mix for Transition Zone (includes EEM, PFO and UPL)

Common Name	Scientific Name	Wetland Status[1]
Douglas Aster	*Aster subspicatum*	FACW
California Brome	*Bromus carinatus*	UPL
Slough Sedge	*Carex obnupta*	OBL
Tufted Hairgrass	*Deschampsia cespitosa*	FACW
Common Spikerush	*Eleocharis palustris*	OBL
Blue Wildrye	*Elymus glaucus*	FACU
Western Mannagrass	*Glyceria occidentalis*	OBL
Puget Sound Gumweed	*Grindelia integrifolia*	FACW
Beach Pea	*Lathyrus maritimus*	FACU
Silky Beach Pea	*Lathyrus littoralis*	FACU
Short-Spur Seablush	*Plectritis congesta*	FACU
Canby Bluegrass	*Poa sanbergii*	FACU
Pacific Silverweed	*Potentilla pacifica*	OBL
Henderson's Checkerbloom	*Sidalcea hendersonii*	FACW

[1]Wetland indicator status based on USACE (2018).

To ensure success of installed vegetation, observations will be made to identify how salinities have changed based on the new topography and to observe the distribution of planted and volunteer salt-tolerant vegetation. If observations indicate a significant deviation in the distribution of both seeded and naturally-colonized salt-tolerant vegetation, adjustments to the proposed planting schedule may be made.

6.2.9 Palustrine Forested Wetland

To maximize the ecological functions and values, and to create high-functioning habitat, approximately 2.91 acres of forested wetland areas are proposed along the fringes of, and interspersed with, the emergent wetlands on elevated hummocks. Forested wetlands will be planted with a diverse assemblage of native woody tree and shrub species to provide densely vegetated habitat and a source of long-term LWM input. The configuration of the proposed forested wetland areas will maximize habitat interspersion and complexity and provide significant forested cover over much of the site. This interspersion of habitat types will also provide shade to reduce water temperatures in Wapato Creek and provide sources of allochthonous inputs.

The palustrine forested wetland design for the LWCHP was based on existing site observations, including on-site groundwater levels, as well as proposed elevations after construction. Based on recorded groundwater elevations and the groundwater seepage modeling, the forested wetland area is proposed in the eastern portion of the site, where groundwater modeling indicates sufficient hydrology. The forested wetland area extends from +13 feet MLLW to between +14 feet and +15 feet MLLW (Figures 13-14) (GeoEngineers 2018, 2021b). These groundwater levels are not currently tidally influenced, as described in Section 5.1. Proposed palustrine forested wetland areas will receive hydrology from direct precipitation, the high groundwater levels, and tidal inundations

up to approximately +14.3 feet MLLW. As demonstrated from previous wetland delineations on the LWCHP site, hydric soils can and do form if there is sufficient hydrology (Grette Associates 2008). Hydrophytic vegetation to support forested wetland conditions will be planted during Year 2 of construction. Vegetation will include both tree and shrub species and will be planted in a gradient with species transitioning from plants that are more tolerant to inundation to less frequent inundation as the elevation increases on the LWCHP site. Based on the Puyallup Tribe of Indians' project requirements identified in their July 22, 2019 letter to the Port, the Project design has preserved as many existing mature trees as possible (approximately 144 trees preserved) and have included as many conifers as possible in the palustrine forested wetland and the forested riparian upland while maintaining a diverse community of shrubs and trees. Figures 10-12 include the planting plan, planting typical and planting schedule for the palustrine forested wetland areas. Table 11 presents the proposed list of trees and shrubs within the palustrine forested wetland planting zone. Table 10 in Section 6.2.8 is the proposed seed mix for the understory. The plants identified in these lists may be further refined/updated based on site conditions and/or plant availability.

Table 11. Palustrine Forested Wetland Tree and Shrub Species

Common Name	Scientific Name	Wetland Indicator Status[1]
Tree Species		
Oregon Ash	*Fraxinus latifolia*	FACW
Sitka Spruce	*Picea sitchensis*	FAC
Western Red-Cedar	*Thuja plicata*	FAC
Western Crabapple	*Malus fusca*	FACW
Live Stakes		
Hooker's Willow	*Salix hookeriana*	FACW
Pacific Willow	*Salix lucida*	FACW
Scouler's Willow	*Salix scouleriana*	FAC
Sitka Willow	*Salix sitchensis*	FACW
Shrub Species		
Redosier Dogwood	*Cornus sericea*	FACW
Black Hawthorn	*Crataegus douglasii*	FAC
Black Twinberry	*Lonicera involucrata*	FAC
Pacific Ninebark	*Physocarpus capitatus*	FACW
Nootka Rose	*Rosa nutkana*	FAC
Hardhack	*Spirea douglasii*	FACW

[1]Wetland indicator status based on USACE (2018).

To ensure success of installed vegetation, observations will be made to monitor post-construction hydrology, including water depth, inundation, and durations. Additional planting or planting zone revisions may occur based on these observations.

6.2.10 Forested Riparian Upland

The interconnected mosaic of intertidal mudflats, estuarine emergent wetlands, and palustrine forested wetlands will be protected by a forested riparian upland area that surrounds the LWCHP site. Approximately 8.24 acres of forested riparian upland will be created and/or enhanced to filter pollutants and provide screening from adjacent development areas (of which 0.84 acre will be creditable as forested riparian upland enhancement). The native woody vegetation (trees and shrubs) will roughen surfaces, slowing surface runoff and increase the ability to remove sediments, nutrients and toxins from surface flows prior to entering Wapato Creek. Although, surface flows from adjacent areas will be limited based on the Project design (topographic elevations) and surrounding conditions as discussed earlier.

Portions of the proposed advance mitigation site currently have forested areas, primarily composed of black cottonwood with several Pacific madrone (*Arbutus menziesii*) and quaking aspen (*Populus tremuloides*) also present in the understory. The existing mature early-successional trees at the LWCHP site are the primary component of the existing upland habitat and will be retained to the greatest extent feasible (approximately 144 trees preserved). Additional native deciduous and coniferous trees, as well as a dense native shrub understory will be installed to maximize habitat functions. The dense woody vegetative community will provide increased terrestrial insect foraging opportunities for fish, as well as food and refuge opportunities for semi-aquatic and terrestrial wildlife.

The forested riparian upland vegetative community (habitat type) design is comprised of three separate planting zones: transitional planting zone, upland zone, and supplemental understory planting zone. The transitional planting zone will consist of both facultative and upland species and be planted on a gradient as the site topography changes. The plants have been selected based on their tolerance of this transitional zone from the wetland to the higher elevations (i.e., from wetter to drier upland conditions). The transitional zone will be planted from elevation +15.0 to +19.0 feet MLLW. The upland zone and the supplemental understory planting zone will be planted from elevation +19.0 feet MLLW to the boundaries of the LWCHP site. The upland zone will include a combination of deciduous and coniferous trees and a dense assemblage of understory shrub species. The supplemental understory planting zone will provide supplemental plantings of the same trees and shrubs planned for the upland zone; however, the plantings will be of differing densities since the supplemental understory planting zone already has well-established, trees present. Figures 10-12 include the planting plan and planting schedule for the upland plant zones. Tables 12 and 13 present the proposed list of trees and shrubs within each forested riparian upland planting zone. Table 14 presents the proposed seed mix for the upland areas. The plants identified in these tables may be further refined/updated based on site conditions and/or plant availability.

Table 12. Transitional Planting Zone for Forested Riparian Upland

Common Name	Scientific Name	Wetland Indicator Status[1]
Tree Species		
Red Alder	*Alnus rubra*	FAC
Oregon Ash	*Fraxinus latifolia*	FACW
Sitka Spruce	*Picea sitchensis*	FAC
Western Red-Cedar	*Thuja plicata*	FAC
Live Stakes		
Scouler's Willow	*Salix scouleriana*	FAC
Shrub Species		
Black Hawthorn	*Crataegus douglasii*	FAC
Pacific Ninebark	*Physocarpus capitatus*	FACW
Nootka Rose	*Rosa nutkana*	FAC
Pea-Fruit Rose	*Rosa pisocarpa*	FAC
Snowberry	*Symphoricarpos albus*	FACU

[1]Wetland indicator status based on USACE (2018).

Table 13. Forested Riparian Upland Planting Zone

Common Name	Scientific Name	Wetland Indicator Status[1]
Tree Species		
Red Alder	*Alnus rubra*	FAC
Black Cottonwood	*Populus balsamifera*	FAC
Douglas-Fir	*Pseudotsuga menziesii*	FACU
Western Red-Cedar	*Thuja plicata*	FAC
Shrub Species		
Vine Maple	*Acer circinatum*	FAC
Western Hazelnut	*Corylus cornuta*	FACU
Tall Oregon Grape	*Mahonia aquifolium*	FACU
Western Crabapple	*Malus fusca*	FACW
Bald-Hip Rose	*Rosa gymnocarpa*	FACU
Pea-Fruit Rose	*Rosa pisocarpa*	FAC
Snowberry	*Symphoricarpos albus*	FACU

[1]Wetland indicator status based on USACE (2018).

Table 14. Upper Seed Mix

Common Name	Scientific Name	Wetland Indicator Status[1]
Common Yarrow	*Achillea millefolium*	FACU
Silver Bur Ragweed	*Ambrosia chamissonis*	FACU
Pearly-Everlasting	*Anaphalis margaritacea*	FACU
Coastal Wormwood	*Artemisia suksdorfii*	FACU
Douglas Aster	*Aster subspicatum*	FACW
Tufted Hairgrass	*Deschampsia cespitosa*	FACW
Blue Wild Rye	*Elymus glaucus*	FACU
Common Woolly Sunflower	*Eriophyllym lanatum*	UPL
Showy Fleabane	*Erigeron speciosus*	FACU
Beach Strawberry	*Fragaria chiloensis*	FACU
Puget Sound Gumweed	*Grindelia integrifolia*	FACW
Meadow Barley	*Hordeum brachyantherum*	FACW
Two Color Lupine	*Lupinus bicolor*	UPL
Seashore Lupine	*Lupinus littoralis*	UPL
Bigleaf Lupine	*Lupinus polyphyllus*	FAC
Short-Spur Seablush	*Plectritis congesta*	FACU
Canby Bluegrass	*Poa sandbergii*	FACU
Pacific Silverweed	*Potentilla pacifica*	OBL
Lance Selfheal	*Prunella vulgaris var. lanceolate*	FACU
Henderson's Checkerbloom	*Sidalcea hendersonii*	FACW
Sterile Wheat Grass	*Triticum aestivum*	UPL

[1] Wetland indicator status based on USACE (2018).

To ensure success of installed vegetation, observations will be made to monitor post-construction site conditions and plant survival. Additional planting or planting zone revisions may occur based on these observations.

6.3 Invasive Plant Species Control

As described in Sections 5.2 and 5.3, the LWCHP site has populations of non-native, invasive and noxious weeds including, but not necessarily limited to reed canarygrass, Himalayan blackberry, Scotch broom, English ivy, and poison hemlock. The Washington State Noxious Weed Control Board considers Scotch broom and poison hemlock Class B noxious weeds, and reed canarygrass, Himalayan blackberry and English ivy Class C noxious weeds (Washington State Noxious Weed Control Board 2020). Key components to successfully restoring the LWCHP site include eradicating the invasive plants and revegetating with dense communities of native trees, shrubs, forbs and grasses.

Large portions of the LWCHP site are infested with reed canarygrass. In accordance with the Washington State Integrated Pest Management Plan for Freshwater Emergent Noxious and Quarantine Listed Weeds (WSDA 2013), the approach to eradicating reed canarygrass at the LWCHP involves mechanical, cultural and chemical methods. Currently, the on-site management of reed canarygrass populations (and other noxious weeds) includes mostly mechanical methods (in the form of mowing), with chemical control (glyphosate or imazapyr) in strategic locations, typically only when in proximity to other noxious weeds.

The primary method for permanent eradication of reed canarygrass and other noxious weeds located on the LWCHP site will be cultural, in the form of site modification and competitive planting. The ideal depth for removal of the bulk mass of reed canarygrass roots is 18 inches. The

majority of the Project site (outside of the forested riparian upland area) will have at least three feet of excavation to form the new Wapato Creek alignment, intertidal mudflats, estuarine emergent wetlands and palustrine forested wetlands. The changed site contours will eliminate reed canarygrass habitat and the re-establishment of intertidal mudflats will discourage reed canarygrass regrowth – a salt-sensitive species. After grading is completed, the site will be seeded with native grasses and forbs which can outcompete non-native and noxious weeds, and dense communities of native trees and shrubs will be planted which can shade out the sun-loving reed canarygrass.

In areas where excavation to 18 inches is not feasible and/or if reed canarygrass and/or noxious weeds are observed after construction is complete, secondary methods for permanent eradication of reed canarygrass and/or noxious weeds may include mechanical (e.g., hand pulling and shading), cultural (e.g., competitive planting), and/or chemical controls.

Ongoing weed management will be an integral part of the Port's adaptive management of the Project site. Section 12 provides additional detail on the Port's adaptive management and contingency plans.

7 Determination of Credits and Credit Use Schedule

The method for determining advance mitigation credits at the LWCHP site is based on compensatory wetland mitigation ratios for Western Washington, in accordance with the joint regulatory agency policies and guidance (Ecology et al. 2006a). The ratio method is the default method for determining credits, as described in the Washington State Rule on wetland mitigation banks (WAC 173-700-312 through 173-700-320, and 173-700-410) and the Federal Rule on compensatory mitigation (33 CFR 332.3(f)(2)). The ratio method is suitable for the LWCHP advance mitigation site because wetland mitigation activities will occur in advance of any unavoidable impacts to wetlands from future Port projects, similar to a mitigation bank.

The determination of credits, including how the advance mitigation credits are generated by the LWCHP, and the credit use schedule have been developed and proposed below based on applicable mitigation regulatory guidance documents (Ecology et al. 2006a, USACE et al. 2012, Ecology and USACE 2013), the Port's approved Place of Circling Waters Advance Permittee-Responsible Mitigation Plan (similar estuary restoration project on Hylebos Creek), and guidance from Ecology (P. Johnson 2020, pers. comm. 7, 9, 14, and 21 December).

7.1 Wetland Credit Generation

The Port proposes to calculate wetland credits generated by the LWCHP as Acre-Credits using the mitigation ratio method (Ecology and USACE 2013). The credits are generated based on the increase in functions, values, and areal extent of aquatic systems on the LWCHP site resulting from the re-establishment of estuarine habitat, palustrine forested habitat, and enhancement of associated uplands on the LWCHP site. Approximately 7.59 acres of buffer on the LWCHP site will be non-creditable (Figure 6).

The most commonly used method for determining (generating) potential credits relies on establishing ratios based on the planned acreage for each mitigation activity (Ecology and USACE 2013). This "ratio method" is used to determine the potential credits generated at the LWCHP site based on the planned acreage of mitigation activity to the potential credit generated. The Project will generate two types of wetland credits; EEM wetland credits and PFO wetland credits. Since the restoration action proposed for the LWCHP is re-establishment for the wetland areas, for every one acre of re-establishment activity, one potential acre-credit is generated (1:1, acre of re-establishment activity to acre-credit). The forested riparian upland enhancement will generate PFO credits at a 5:1 ratio (five acres of enhancement activity is equal to one acre-credit). Table 15 presents the potential credits generated for the LWCHP site based on mitigation activity (re-establishment/enhancement) acreages and the proposed credit generation ratio.

Table 15. Wetland Credit Generation

Advance Mitigation Activity	Area of Mitigation Activity (acres)	Credit Generation Ratio	Potential EEM Wetland Credits (Acre-Credits)	Potential PFO Wetland Credits (Acre-Credits)
Estuarine Wetland Re-establishment[1]	6.27	1:1	**6.27**	**N/A**
Palustrine Wetland Re-establishment[2]	2.91	1:1	**N/A**	**2.91**
Forested Riparian Upland Enhancement[2]	0.84	5:1	**N/A**	**0.17**
Total	**10.02**	**N/A**	**6.27[1]**	**3.08-3.75[2]**

[1]Wapato Creek Channel/Intertidal Mudflat and EEM. Acreage is an estimate only. Acreage will be determined after the Year 1 monitoring effort to properly document actual on-site conditions. See Section 7.3 for more detail.
[2]Acreage for PFO and UPL an estimate only. This habitat type may develop into PFO and/or UPL. This will be determined after the Year 1 monitoring effort to properly document actual on-site conditions. See Section 7.3 for more detail.

The proposed credit generation ratios are within the recommended range presented in the Credit Guide for Wetland Mitigation Banks (Ecology and USACE 2013). The LWCHP proposed credit generation ratios are on the low end of the range; however, they are justified based on the following factors: expected lift in function, restoration of ecological processes, likelihood of success, rarity of habitat types/limiting factors, and anticipated development of a Category I estuarine wetland.

7.1.1 Expected Lift in Function

An immediate lift in water quality, hydrologic, and habitat functions is anticipated after construction through the re-establishment of historically lost, locally significant habitat types.

7.1.1.1 Water Quality

Wapato Creek will be relocated from its current position immediately adjacent to 12th Street East and within 70 feet of East Alexander Avenue and re-meandered through the center of the LWCHP site. In its current location along 12th Street East, Wapato Creek lacks a functional buffer (approximately 10 feet), and receives stormwater input directly from the roadway. This pollutant source will be largely removed from Wapato Creek through relocating the creek away from the roadway and installing a vegetated filter strip along 12th Street East and topographic separation from the LWCHP. The site will be seeded with native wetland and upland seed mixes, planted with a diverse assemblage of native emergent, shrub and tree species, and include LWM structures throughout the proposed creek channel and the floodplain wetland areas. Additionally, densely planted forested riparian upland habitat will be enhanced around the aquatic habitat areas.

In general, emergent vegetation, woody-stemmed shrubs and trees, LWM and other surface roughening features act to remove pollutants. The proposed installation of these features will roughen the wetland and buffer surfaces to slow flow, increasing the wetland and buffer's abilities to remove sediments, nutrients and toxins from surface flows prior to entering Wapato Creek.

7.1.1.2 Hydrologic Functions

Wapato Creek is currently an artificially straightened ditch channel, and floodplain and off-channel habitats are absent from the site. The LWCHP will reroute the creek channel and re-establish intertidal mudflat and estuarine emergent wetland habitats adjacent to the channel, and reconnect Wapato Creek with a functional floodplain and wetlands. The reconfigured creek channel, re-established floodplain, installed LWM structures, and native shrub and forested habitats will increase the site's ability to regulate flood flows, provide additional flood storage capacity and help increase overall hydrologic functions.

7.1.1.3 Habitat Functions

The restoration actions will remove invasive plants (including root stock and seed bank), increase the diversity and areal extent of aquatic habitats, install a diverse assemblage of native trees, shrubs and emergent species, provide LWM structures, re-meander the creek channel and reconnect the floodplain, add off-channel habitat, and provide habitat interspersion and connectivity between the different habitat types. The existing mature deciduous trees at the LWCHP site will be retained to the greatest extent practicable and provide key benefits (e.g., shade, forage opportunity, etc.) immediately after Project completion. Additional native deciduous and coniferous trees, as well as native shrubs and emergent species, will be installed throughout the wetland and buffer areas to maximize habitat functions. The post-project habitat functions will increase substantially for aquatic, avian, and terrestrial species as compared to the current habitat functions provided by the site.

7.1.2 Restoration of Ecological Processes

Restoration of estuarine and palustrine wetland processes will be realized immediately upon removal of the fill material, reconfiguring Wapato Creek into a meandering channel with floodplain connectivity, and replacing the undersized culverts with a full-span bridge.

7.1.3 Likelihood of Success

The Port has a long record of successfully completing and maintaining habitat/mitigation projects. To date, the Port has successfully established over 200 acres of habitat restoration from over 20 projects since 1986. A majority of the habitat mitigation sites have successfully completed a monitoring period to demonstrate performance standards were met (Table 1). Most recently, the Port's Place of Circling Waters met several Year 10 performance standards by Year 7, and the Port's Upper Clear Creek Mitigation Site met or exceeded several of its Year 5 performance standards during Year 3.

The LWCHP advance mitigation site has a high likelihood of success because it involves restoring estuarine and palustrine wetlands, which are the suitable hydrogeomorphic classes in the landscape setting of this lower reach of Wapato Creek.

Proposed wetland re-establishment has a high likelihood of success and long-term sustainability due to the site selection and the elevation-based design. The combination of freshwater input from Wapato Creek and direct precipitation, as well as the tidal influence from Commencement Bay will support wetland hydrology, hydric soil development, and hydrophytic vegetation establishment. These design features are based on hydrologic monitoring and modeling, and subsurface exploration of the site (Figures 13-14). Wetland elevations have been established based

on known tidal elevations at the site to provide a high level of confidence that adequate hydrology will be achieved. Additionally, soils at the site are dredged fill material placed over historic wetland and mudflat soils, which provides a high likelihood of success that wetland soils will be restored.

Invasive species eradication and the successful establishment of estuarine emergent and palustrine forested wetland vegetation has a high likelihood of success because the mechanical excavation of surface soils containing the bulk mass of root systems and seed banks is feasible and allows for suitable hydroperiods for native vegetation establishment based on hydrologic monitoring and modeling of the LWCHP site.

The Port is committed to implementing additional adaptive management measures based on site conditions to ensure the long-term success of the LWCHP. See Section 12 for adaptive management and contingency plans.

7.1.4 Rarity of Habitat Types/ Limiting Factors

Restoration activities at the LWCHP site will address several salmon habitat limiting factors that also represent rare habitats in the Wapato Creek watershed (see Table 5 in Section 5.4). In particular, the LWCHP will remove a partial fish passage barrier, improve floodplain connectivity, provide bank stability, introduce LWM, provide off-channel habitat, improve riparian and water quality conditions, and re-establish intertidal mudflats and estuarine emergent wetlands.

7.2 Fish Habitat Credit Generation

The Port also proposes to generate separate non-ESA-listed fish habitat credit (fish habitat credit) specifically for the replacement of the twin, 60-inch diameter, perched culverts at the 12th Street East crossing with a full-span bridge and the additive fish habitat benefits of the LWCHP. These fish habitat improvements are voluntary and are proposed in order to generate advance mitigation credit for the Port to construct future crossing(s) of Wapato Creek (up to 60 feet in total width, parallel to flow) downstream of the LWCHP site. The culverts are not owned by the state of Washington; therefore, replacement is not currently required by law. The voluntary replacement of the perched culverts and the design of LWCHP will provide immediate improvements to fish habitat within Wapato Creek which are complementary, but additional to, the wetland improvements used to calculate the wetland credits generated by the LWCHP in Section 7.1 above. The new creek channel under 12th Street East will contain stream substrate, which improves ecological functions compared to the current round, narrow, concrete culverts with no substrate in place. The single large opening provided by the bridge will also improve fish passage, eliminate the long, dark tunnels, reduce flow velocities, and improve natural tidal fluctuations under 12th Street East.

7.3 Credit Generation Schedule

Joint regulatory guidance (1.f.) recommends proposing a credit generating schedule (or framework) to demonstrate how the credits will increase over time as the site matures and successfully reaches performance standards (USACE et al. 2012).

The credit value of an advance mitigation site will increase over time (i.e., use ratios are reduced over time) because the temporal loss is eliminated or decreased if the mitigation site is established and meets performance standards prior to the use of the generated credits. The joint regulatory agency guidance states that mitigation sites will not generate advance mitigation beyond the concurrent ratios until performance standards have been met for a minimum of two calendar years after the earthwork and plantings have been completed (USACE et al. 2012). An exception is given for sites or portions of sites that produce immediate improvements in wetland or fish habitat, such as removing fish barriers and wetland re-establishment in some cases (USACE et al. 2012). These cases are reviewed by the regulatory agencies on a case-by-case basis. As the Port understands the guidance, an advance mitigation site's credits are all available upon completion of construction (i.e., as-built report); however, the value of the credits increases over time through reduced use ratios (typically starting the reductions after Year 2).

Based on the joint regulatory guidance (USACE et al. 2012), and guidance from Ecology (P. Johnson 2020, pers. comm. 7, 9, 14, and 21 December), the AMP reflects a phased approach to determine the number of credits generated for estuarine and palustrine wetlands, and forested riparian upland enhancement (excluding non-creditable buffer). This estuary restoration project, comprised of the re-established stream channel, intertidal mudflat, estuarine emergent and palustrine forested wetlands, and enhanced forested riparian upland provide a unique and valuable resource, as they represent now rare wetland and fish habitat types in Wapato Creek, the lower Puyallup River watershed and Commencement Bay. Due to the uncertainty of the site's intertidal complexity, the number of credits generated for estuarine and palustrine wetlands will be determined after the Year 1 monitoring effort and documented in the Year 1 monitoring report. As the site establishes and matures, the number of credits generated for each wetland type may be updated to reflect on-site conditions (e.g., quantities of EEM, PFO, and/or UPL are different than the estimates from this AMP). The number and type of wetland credits generated by the Project will be determined by the Port and approved by the Corps and Ecology before the first request for credit use. Based on subsequent monitoring events, the number of wetland credits generated for each habitat type may be updated accordingly to reflect on-site conditions if approved by the Corps and Ecology. The 7.59 acres of non-creditable buffer will remain constant to provide sufficient buffer around the creditable area.

Most estuary functions will be provided upon completing the new channel, including hydrology, hydraulics, tidal action, and salinity. Through the conversion of former upland with invasive species to these rare wetland and fish habitat types, the area will immediately produce a substantial amount of ecological lift. By removing a partial fish passage barrier and converting over 9 acres of upland fill area into Category I wetlands, the Port seeks reduced use-ratios on an accelerated schedule compared to the standard reduced use-ratio schedule. The reduced ratios will be based on demonstrated ecological performance and will reflect the accelerated ecological lift produced by the site (case)-specific restoration actions and the timing of construction.

Section 11 describes the use of wetland and fish habitat credit for future Port development projects within the Geographic Service Area determined to have unavoidable impacts to aquatic resources.

8 Performance Standards

During the establishment period of the LWCHP site, performance standards will be used to determine if the Project is achieving its objectives. Performance standards are categorized by Project objectives and identified with an alpha-numeric code for easy reference (for example, Objective 2, Performance Standard B is depicted as 2B).

Section 9 provides detail on the monitoring methods. It describes how each performance standard will be measured and which years they will be monitored.

8.1 Wapato Creek Stream Channel

Objective 1: Restore Wapato Creek from a straight ditch to a meandering, tidally-influenced channel with functioning floodplain and in-stream habitat features.

1A. Establish a sinuous, tidally-influenced stream channel, at least 1,800 feet long. Successful performance standard achievement will be demonstrated through an as-built survey (documented in an as-built report) following construction, measured by the centerline of the channel, and a topographic survey after construction of the new channel.

1B. Channel to retain at least 20 pieces of LWM along its banks. Successful performance standard achievement will be demonstrated by documenting the number and locations of at least 20 LWM pieces along Wapato Creek banks (below elevation +13.0 feet MLLW) in Year 10.

8.2 Wetland Re-establishment

Objective 2: Re-establish intertidal mudflats and hydrologically-connected estuarine emergent and palustrine forested wetlands.

2A. Create at least 9 acres of wetland, intertidal mudflat, and channel habitat by the end of the monitoring period. Successful performance standard achievement will be demonstrated through wetland delineations conducted in Years 3, 5 and 10.

2B. Wetland hydrology shall be established across the EEM and PFO wetlands. Successful performance standard achievement will be demonstrated by documenting soil inundation or saturation to the surface of free water at 12 inches or less below the soil surface for at least 14 consecutive days during the growing season. This applies to normal precipitation or wetter conditions, where the growing season is defined in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Western Mountains, Valleys, and Coast* Regional Supplement (USACE 2010). Successful performance standard achievement will be demonstrated through wetland delineations conducted in Years 3, 5 and 10.

2C. Vegetation will be planted in accordance with the approved planting plans. Successful performance standard achievement will be through documentation of installed plants in an as-built report.

2D. In the intertidal mudflat and EEM wetland, native emergent vegetation will collectively have a minimum 10 percent cover at Year 1, 20 percent cover at Year 2, 30 percent cover at Year 3 and 50 percent cover by Year 10. Successful performance standard achievement will be demonstrated through documentation of the percent cover of native emergent species in Years 1, 2, 3, 5, 7 and 10.

2E. In the PFO wetland, native trees and shrubs will collectively have a minimum 10 percent cover at Year 1, 15 percent cover by Year 2, 25 percent cover at Year 3, 50 percent cover at Year 5, 60 percent cover in Year 7 and 70 percent cover in Year 10. Successful performance standard achievement will be demonstrated through documentation of percent cover of native tree and shrub species in Years 1, 2, 3, 5, 7 and 10.

2F. Himalayan blackberry (*Rubus armeniacus*), Scotch broom (*Cytisus scoparius*), tansy ragwort (*Jacobaea vulgaris*), Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), and non-native cattail (*Typha* spp. other than *T. latifolia*) do not collectively exceed 10 percent cover at Years 1, 2, 3, 5, 7 and 10. Successful performance standard achievement will be demonstrated through documentation of percent cover of invasive species in Years 1, 2, 3, 5, 7 and 10.

2G. Zero tolerance of Pierce County-listed Class A noxious weeds, knotweed (*Polygonum* and *Persicaria* spp.), purple loosestrife (*Lythrum salicaria*), and English ivy (*Hedera helix*). Successful performance standard achievement will be demonstrated through documentation of presence/absence and/or eradication of these species in Years 1, 2, 3, 5, 7 and 10.

2H. Establish at least 1.0 acre of Saltwater Tidal Fringe (Estuarine), as defined by the 2014 Wetland Rating System for Western WA. Area of saltwater tidal fringe wetland will be at least 1.0 acre and meet at least two of the Special Characteristics from criteria SC 1.2. of the 2014 Wetland Rating System for Western Washington at Years 1, 3, 5 and 10. If the saltwater tidal fringe wetland HGM classification is not met, the area will be evaluated as freshwater tidal fringe. The monitoring reports will document the extent of saltwater tidal fringe.

2I. At least 6 acres of estuarine wetland, intertidal mudflats, and channel habitat will be inundated by high tides at a minimum high tide of +12.0 feet MLLW. This will be monitored and recorded by data loggers in Years 1 and 2 (while vegetation is being established), and specific photo points that are representative of the estuarine wetland, intertidal mudflat and channel. The monitoring reports will document the extent of tidal inundation.

8.3 Establish Forested Riparian Upland

Objective 3: Establish and preserve a dense forested riparian upland.

3A. Vegetation will be planted in accordance with the approved planting plans. Successful performance standard achievement will be through documentation of installed plant in an as-built report.

3B. Native trees and shrubs will collectively have a minimum of 10 percent cover in Year 1, 15 percent cover at Year 2, 20 percent cover at Year 3, 35 percent cover in Year 5, 50 percent cover in Year 7 and 70 percent cover in Year 10. Successful performance standard achievement will be through documentation of percent cover of native tree and shrub species in Years 1, 2, 3, 5, 7 and 10.

3C. Himalayan blackberry (*Rubus armeniacus*), Scotch broom (*Cytisus scoparius*), tansy ragwort (*Jacobaea vulgaris*), Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*) do not collectively exceed 10 percent cover at Years 1, 2, 3, 5, 7 and 10. Successful performance standard achievement will be demonstrated through documentation of percent cover of invasive species in Years 1, 2, 3, 5, 7 and 10.

3D. Zero tolerance of Pierce County-listed Class A noxious weeds; non-native, invasive knotweed (*Polygonum* and *Persicaria* spp.); purple loosestrife (*Lythrum salicaria*); and English ivy (*Hedera helix*). Successful performance standard achievement will be demonstrated through documentation of presence/absence and/or eradication of these species in Years 1, 2, 3, 5, 7 and 10.

3E. The number of vegetation strata present within the forested riparian upland will be at or greater than 3 at Year 10. Successful performance standard achievement will be demonstrated through the documentation of the number of vegetation strata at Year 10.

8.4 Fish and Wildlife Habitat and Fish Passage

Objective 4: Improve fish passage at the 12th Street East crossing.

4A. Replace twin, perched, 60-inch diameter culverts with a full-span bridge at the 12th Street East crossing. Successful performance standard achievement will be demonstrated through an as-built survey (documented in an as-built report).

4B. Habitat features installed according to the approved plan. Habitat features include 29 snags and 172 LWM. Successful performance standard achievement will be demonstrated through an as-built survey (documented in an as-built report).

4C. A minimum of 80% of the original number of habitat features installed, as shown on the approved as-built drawings, will be present at Year 10. Habitat features include snags and LWM. Successful performance standard achievement will be demonstrated through documentation of presence of habitat features in Year 10.

4D. Fish passage will be maintained year-round within at least one route through the LWCHP site. An inundated channel/thalweg will be present year-round through the LWCHP site as documented through a visual survey during a summer low-tide of monitoring years. Successful performance standard achievement will be demonstrated through documentation of presence of at least one fish-passable channel in Years 1, 2, 3, 5, 7 and 10.

9 Monitoring

The Port will implement monitoring during the establishment period to determine if the LWCHP site is meeting performance standards and/or if adaptive management is needed. The establishment period is scheduled for 10 years. Qualified scientists will conduct the performance standard monitoring. Additional observations, including hydrology and invasive species surveys, will occur annually throughout the establishment period to ensure the site is on track to meet performance standards and identify any need for adaptive management at the LWCHP site.

Formal performance standard monitoring will occur in Years 1, 2, 3, 5, 7 and 10, with subsequent monitoring reports documenting the results of the monitoring effort. Formal monitoring will include both qualitative and quantitative data collection to address achievement of the performance standards described in Section 8. The Agreed Order attachments specify the reporting requirements for the as-built and monitoring reports.

Informal inspections will be conducted annually throughout the establishment period. Informal inspections provide a general overview of site progress to ensure that the LWCHP site is progressing towards meeting performance standards. Informal inspections will usually include observation notes and site photos. Informal inspections may quantitatively address some performance standards for upcoming years but may be less statistically rigorous than the formal monitoring.

9.1 Post-Construction (As-Built) Monitoring

Post-construction monitoring will document as-built conditions and establish monitoring transects, sampling locations, and permanent photo points throughout the entire LWCHP site. Photographs taken at the permanent photo points will be included to document the as-built conditions. A Professional Land Surveyor (PLS) will conduct an as-built survey of the site following final construction. The survey and/or record drawings will document the physical on-site conditions, including habitat (standing snags, LWM) features, plant zones, topography (1-foot contour intervals) and the centerline of the constructed channel; and to identify any deviations from the approved, permitted construction plans. The Port will evaluate and document as-built conditions in an as-built report which will include the as-built survey, earthwork (i.e., grading), culvert removal and bridge installation, LWM installation, seeding, and plantings. Earthwork conditions assessed will include graded surfaces comprising habitat features across the site such as the new Wapato Creek channel alignment, and elevations to support intertidal mudflats, estuarine emergent wetlands, palustrine forested wetlands and riparian buffer.

The as-built survey and report will satisfy the following performance standard requirements: 1A, 2C, 3A, 4A, and 4B.

9.2 Monitoring Methods During Establishment Period

The following sections outline the specific methods to be used to monitor the establishment of the LWCHP site and to determine the status of performance standards and final success criteria that correspond to the Project objectives (Section 8). The monitoring methods include a combination of collecting monitoring data along established transects, at fixed points, and by means of walk-

through surveys in randomly selected areas. Photo points will be established in sufficient numbers to give an accurate visual representation of on-site conditions.

9.2.1 Wapato Creek Stream Channel

Visual observations of the stream channel and associated LWM (below elevation +13.0 feet MLLW) will be conducted in accordance with the monitoring schedule identified in Section 9.4 to compare results against the performance standards.

1B. LWM structures along the streambanks of the new Wapato Creek alignment will be counted as part of the informal inspections. The number of LWM structures counted in Year 10 will be measured against the performance standard. The Year 10 monitoring effort will determine if this performance standard has been achieved.

4D. The constructed Wapato Creek stream channel will be walked and visually observed to document presence of an inundated channel/thalweg through the LWCHP site during a summer low-tide of monitoring Years 1, 2, 3, 5, 7 and 10.

9.2.2 Wetland Hydrology

Hydrology monitoring will be conducted in accordance with the monitoring schedule identified in Section 9.4 to compare results against the performance standards. A wetland assessment, including hydrology observations, will be conducted in Year 1 to provide preliminary estimate on wetland acreage for number and type of wetland credits generated for the LWCHP.

2A. Full wetland delineations will be conducted in Years 3, 5 and 10, and will follow the criteria outlined in the USACE Wetlands Delineation Manual and the associated regional supplement (Environmental Laboratory 1987; USACE 2010).

2B. Shallow groundwater monitoring wells equipped with hydrologic monitoring devices (pressure transducers) will be installed and programmed to log ground and surface water elevation data once per hour between Year 1 installation through Year 10. The recorded data will be downloaded from the transducers periodically (approximately semi-annually). The EEM and PFO wetlands will each have three pressure transducers installed in locations that are representative of each habitat's conditions. These locations will be identified and documented in the as-built report.

2H. Salinity monitoring of proposed estuarine wetland areas will be conducted during Years 1, 2, and 3, during the annual low flow (summer) at high tide (at least 5 events) to document salinity. Monitoring will occur in at least three locations across the proposed estuarine wetland area as defined in the as-built report.

2I. Tidal inundation monitoring of the proposed estuarine wetland will be conducted during Years 1 and 2 (while vegetation is being established). Monitoring will occur utilizing the installed data loggers as defined in the as-built report. In addition, photos from specific photo points of the inundated areas will be taken during a winter high tide during monitoring Years 1 and 2. The Port may extend or reinitiate this monitoring to document changing conditions discussed in Section 12.

9.2.3 Vegetation

Vegetation monitoring will occur after the peak growing season to observe plant health. Year 1 monitoring will occur in August-early September. Quantitative vegetation monitoring will be

completed using two monitoring methods along established transects. A total of four (4) transects will be established at the site, oriented north/south, and spaced 250 feet apart. At least one percent of the LWCHP site will be monitored for vegetation. For vegetation less than or equal to one meter (≤1 m) tall, the canopy cover plot method will be used (Daubenmire 1959). For vegetation greater than one meter (> 1 m) tall, the line-intercept method will be used (Canfield 1941). These two methods will be used for all plant communities within the LWCHP site when monitoring the following performance standard requirements: 2C, 2D, 2E, 2F, 2G, 3B, 3C, and 3D. Observed vegetation will be identified to species for both sampling methods. Native vegetation observed in the emergent and intertidal mudflat habitat types will be identified by plot but the overall vegetative cover will be averaged collectively (performance standard 2D).

9.2.3.1 Plot Sampling Method

The plot sampling method (modified from Horner and Raedeke 1989) will be used to quantify the percent cover of vegetation ≤1 m tall. Sampling plots one square meter (1 m^2) in size will be located at 6-meter intervals along the transects as described in the following steps.

1. Lay out the measuring tape along the transect and make sure the tape is taught, straight and firmly anchored. Stay to the left side of the transect to avoid disturbing the vegetation to be sampled.
2. At the 1 m point along the tape, place the 1 m^2 frame on the right side of the tape with the lower left corner of the frame at the meter marker designated for sampling.
3. Document standing water, if present, and record depth.
4. Record percent cover for each species present within the plot. The percent cover of individuals of a species within the plot will collectively be estimated as a unit. A plant does not need to be rooted within the plot to have coverage over it.
5. Estimate and record the amount of bare ground within the plot.
6. Advance 6 meters to the next plot location and repeat this process until the end of the transect.

This process will be repeated for each transect.

9.2.3.2 Line-Intercept Sampling Method

The line-intercept sampling method (Canfield 1941) will be used for trees and shrubs >1 m tall as described in the following steps.

1. Lay out the measuring tape along the transect and make sure the tape is taught, straight and firmly anchored. Stay to the left side of the transect to avoid disturbing the vegetation to be sampled.
2. Starting at the beginning of the transect, record the line-intercept species and intercept length (portion of the transect length intercepted by perpendicular projection of plant foliage) of each shrub and tree along the transect.
3. Record total transect length.

This process will be repeated for each transect.

9.2.3.3 Vegetation Strata

3E. The number of vegetation strata will be recorded based on the data gathered from the canopy cover monitoring along the permanent transects. Vegetation strata are defined as the occurrence of a layer of vegetation having similar height and growth habit. Vegetation strata classes will include trees; small trees (i.e., saplings); shrubs; perennial grasses, forbs, and emergents; and ferns and fern allies. The number of strata will be counted within the forested riparian upland.

9.2.4 Large Woody Material

During formal monitoring visits and informal inspections, general observations of LWM along the creek channel and within the floodplain will be recorded for representative LWM structures, including photo documentation, count, and condition.

1B. The number of LWM structures counted along the banks (below +13.0 feet MLLW) of the new Wapato Creek alignment will be measured against the performance standard in Year 10.

4C. The number of LWM structures counted at the LWCHP site will be measured against the performance standard in Year 10.

9.2.5 Fauna

During formal monitoring visits and informal inspections, observations of fish and wildlife species will be recorded. Fish, birds, mammals, amphibians and reptiles that are observed on site will be identified to species (if possible), and observations of breeding, nesting or other signs of activity will be documented and reported in monitoring reports for Years 1, 2, 3, 5, 7 and 10.

9.2.6 Photographic Documentation

Photo points will be established throughout the LWCHP site in permanent locations to document wetland and upland vegetation success and development over time, as well as the condition of the Wapato Creek channel, habitat complexity and development. Photographs, including time and date stamps, GPS position, and azimuth or direction of the photo will be taken from the same locations (and facing the same direction) during each vegetation monitoring visit.

Photographs to document tidal inundation will be taken during a higher high tide and a lower high tide to capture the inundation regime at the site during different tidal cycles. The approximate tide level will be included with a time and date stamp to demonstrate what tide was captured at the time of the photo. These photos will be taken from established photo points that provide a representative view of tidal inundation. These photo points may be the same as the vegetation photo points or standalone, supplemental photo points. This will be documented in the as-built report.

In addition, significant erosion or accretion events will be photographed, as well as changes to channel morphology, habitat features (e.g., nests, dens), and other significant physical or biological developments.

9.3 Monitoring Reports

As part of the monitoring program, the Port will submit monitoring reports to regulatory agencies and local jurisdictions presenting the results of the formal monitoring and evaluation of Project objectives, performance standards and final success criteria.

9.3.1 As-Built Report

Within 90 days of completion of construction (grading and planting), the Port will prepare and submit an as-built report to the regulatory agencies. This report will document the as-built conditions and describe any deviations from the approved design/plan as discussed in Section 9.1.

9.3.2 Monitoring Reports

No later than March 1 of the year following a formal monitoring year, the Port will submit a monitoring report to the regulatory agencies detailing the results of the previous year's monitoring efforts. The report will document site conditions, provide a summary of the adaptive management actions conducted onsite, describe any deviations from the monitoring protocols, and discuss the monitoring results relative to the Project objectives and performance standards. The report will also describe any potential problems observed and recommend adaptive management actions, if needed.

9.4 Monitoring Schedule

Year 0 is the year during which construction, including plant installation, is completed. Year 1 is the first growing season following the completion of construction (i.e., grading and planting). Formal monitoring of the LWCHP site during the establishment period will occur in Years 1, 2, 3, 5, 7 and 10. Year 1 will include a wetland assessment including wetland hydrology measurements, in the areas designed to be wetland (EEM and PFO) to determine the number of wetland credits available for each wetland type. Years 3, 5 and 10 will include a full wetland delineation as part of the formal monitoring effort. Unless otherwise noted, vegetation monitoring activities will be conducted during the summer (July through September). Monitoring reports will be submitted to regulatory agencies by March 1 of the following calendar year.

9.5 Mitigation Monitoring Closeout

When the LWCHP site has reached the end of its specified monitoring period and achieved final performance standards, the Port will request that it be closed out (i.e., the site is accepted by regulatory agencies as a success and further monitoring work ceased). The Port will prepare and submit a final monitoring report or closeout report (Year 10) to the regulatory agencies to establish this milestone has been reached. The submittal will explain the rationale for closing out the site.

10 Maintenance

Maintenance of the LWCHP site will be the Port's responsibility. Comprehensive informal inspections will be conducted in the spring by a qualified scientist on an annual basis to determine what maintenance activities are needed. Any areas of invasive vegetation infestation or evidence of illegal dumping will be noted. Observations made during the informal inspection will be submitted to the Port and used to develop maintenance recommendations. Those recommendations will be implemented by Port personnel and/or assigned conservation groups. The site will be managed for all state and county-listed Class A, B and C invasive/noxious weeds; not just those listed in the performance standards.

Additional observations made during and after maintenance actions have occurred, including summer monitoring events, will assess the effectiveness of maintenance actions and identify additional maintenance recommendations, if needed. The Port's Habitat Mitigation Site Stewardship Procedure details the Port's stewardship program and how it is used to ensure performance standards at habitat restoration sites are being achieved. The procedure is reviewed annually and is included as Appendix D. If it is determined that routine maintenance will not effectively correct an issue, adaptive management will be implemented as described in Section 12.

11 Use of Credits

Credits generated at the LWCHP site may be used, subject to the approval of regulatory agencies with jurisdiction over the impact, to compensate for authorized impacts to aquatic resources within the Geographic Service Area identified in Section 3. The Project will generate two types of wetland credits; EEM wetland credits and PFO wetland credits as described in Section 7 and Table 15. EEM wetland credits may be used for authorized impacts to estuarine wetlands with no ESA-listed species present and palustrine wetlands. PFO wetland credits may be used for authorized impacts to palustrine wetlands only.

11.1 Use of Wetland Credits

Joint guidance states that credit value will generally increase over time because temporal loss is eliminated (USACE et al. 2012). A site would not generate advance mitigation credit beyond concurrent ratios until the site has been functioning and meeting performance standards for a minimum of two calendar years; however, the guidance also states that there are circumstances where a site may generate advance mitigation credit within the first two years. In some cases, fish passage barrier removal and wetland re-establishment can generate advance mitigation credit. Such circumstances will be reviewed on a case-by-case basis.

Wetland mitigation ratios proposed for the use of LWCHP-generated wetland credits (acre-credits) take into account the high value of estuarine functions that will be re-established, the reduced risk associated with advance mitigation at this site, and the immediate lift in ecological and estuarine functions upon completion of construction which is not typical of most restoration projects. Anticipated lift in ecological function and the restoration of ecological processes resulting from the LWCHP and its likelihood of success are described in Section 7.2.

Joint regulatory guidance (1.h.) recommends appropriate mitigation ratios be proposed based on the impact type, and quality of and functions provided by the wetlands at the impact site (USACE et al. 2012). Tables 16 and 17 provide the proposed LWCHP advance mitigation ratios based on discussions with Ecology (P. Johnson 2020, pers. comm. 7, 9, 14, and 21 December). Table 16 specifies credit use ratios for estuarine and palustrine wetland impacts and will use the credits generated from the EEM wetland. Table 17 specifies credit use ratios for palustrine wetland impacts only and will use the credits generated from the PFO wetland and UPL enhancement. Both tables also include credit use ratios for stormwater ditches. For purposes of this AMP, stormwater ditches are defined as manmade features constructed wholly in upland areas for the purpose of conveying surface water and are considered jurisdictional (Waters of the U.S.; Waters of the State) by the USACE and Ecology, respectively, under the Clean Water Act.

Table 16. Proposed Credit Use Ratios for EEM Wetland Credits

Age of the Site (Years)	Category I Estuarine and Palustrine[1]	Category II Estuarine and Palustrine	Category III	Category IV	Stormwater Ditches
0 & 1	Case-by-case	3:1	2:1	1.5:1	1:1
2	Case-by-case	2.5:1	1.8:1	1.4:1	0.9:1
3	Case-by-case	1.8:1	1.6:1	1.3:1	0.8:1
4 & 5	Case-by-case	1.6:1	1.3:1	1.2:1	0.6:1
6 & 7	Case-by-case	1.4:1	1.2:1	1:1	0.6:1
8 & 9	Case-by-case	1.25:1	1:1	0.85:1	0.5:1
10 & Beyond	Case-by-case	1:1	0.9:1	0.75:1	0.5:1

[1] Ratios for Category I wetland impacts will be higher than the ratios listed for Category II.

Table 17. Proposed Credit Use Ratios for PFO Wetland Credits

Age of the Site (Years)	Category I Palustrine[1,2]	Category II Palustrine[2]	Category III	Category IV	Stormwater Ditches
0 & 1	Case-by-case	3:1	2:1	1.5:1	1:1
2	Case-by-case	2.75:1	1.85:1	1.4:1	0.9:1
3	Case-by-case	2.5:1	1.7:1	1.3:1	0.8:1
4 & 5	Case-by-case	2.1:1	1.5:1	1.2:1	0.7:1
6 & 7	Case-by-case	1.6:1	1.2:1	1:1	0.6:1
8 & 9	Case-by-case	1.5:1	1.1:1	0.9:1	0.5:1
10 & Beyond	Case-by-case	1.2:1	1:1	0.85:1	0.5:1

[1] Ratios for Category I wetland impacts will be higher than the ratios listed for Category II.
[2] Ratios may not apply to Category I and Category II wetlands based on Special Characteristics.

Section 7.1 provides rationale for use of reduced ratios on an accelerated schedule. Credit-use ratios will begin to reduce after the Year 1 monitoring report demonstrates that performance standards are met. If LWCHP is establishing and maturing faster than anticipated (e.g., meeting Year 5 performance standards in Year 3), the Port may request to use credits at the reduced ratio for which the site is performing.

11.2 Use of Fish Habitat Credit

As described in Section 7.2, the LWCHP generates additional fish habitat credit, independent of the wetland credits generated for the site, in advance of potential future impacts on Wapato Creek downstream of the LWCHP site. This separate fish habitat credit generated by the LWCHP, in advance of any impacts, will allow the Port, subject to the approval of regulatory agencies with jurisdiction over the impact, to construct future crossing(s) of Wapato Creek up to 60 feet in total width, parallel to flow (downstream of the LWCHP site). Potential future use of this advance credit includes widening the existing crossing from East Alexander Avenue to Port Parcel 15 (the former Portac site), the installation of a second vehicular crossing at this site (for one-way inbound and outbound traffic), or the installation of additional railroad tracks across Wapato Creek near SR 509.

Any future crossing of Wapato Creek downstream of the LWCHP site would impact the same fish stocks and wildlife that would utilize the LWCHP site. As stated elsewhere, currently there is no anticipated use of Wapato Creek by ESA-listed salmonids. However, the LWCHP restoration will benefit any and all fish species that utilize the project site now or in the future.

Based on the bank-full width of Wapato Creek in the downstream location and a recently permitted culvert removal/bridge replacement project in that location (Corps No. NWS-2019-946-WRD & WDFW HPA No. 2020-6-105+01), the potential impacted bank-full width area of future crossing(s) totaling 60 feet in width (parallel to flow) would be approximately 6,600 square feet (~0.15 acre). The substantial improvement of fish habitat provided by the LWCHP, in advance of the impact, more than adequately compensates for the potential future impact from crossing(s) totaling 60 feet in width (parallel to flow). The Port proposes that the full 60 feet of mitigation value be available upon completion of construction (approval of the as-built report) as fish habitat improvements and significant increase in ecological functions will be realized immediately upon construction and based on the significant fish habitat restoration value of the LWCHP versus the proposed fish habitat credit.

11.3 Credit/Debit Accounting

The Port will maintain a ledger for each type of credit (EEM wetland credit, PFO wetland credit, and fish habitat credit) generated by the LWCHP to document credit use over time and to show the remaining balance at all times. The ledger will include the following for each type of credit (wetland credit and fish habitat credit):

- Total quantity and type of credits generated;
- Date of credit use;
- Site where credits were used;
- Regulatory agency and permit number of the project with credit use (debit);
- Quantity and type of credits used (debited); and
- Remaining quantity and type of credits available for use.

As discussed previously, the units for wetland credit generation and use are acre-credits. The units for fish habitat credit generation and use is a width (feet), parallel to flow, of a structure across Wapato Creek, downstream of the LWCHP site. As described in Section 7.2, the LWCHP generates additional fish habitat credit (60 feet). The ledger will include the width, parallel to flow, of any new structure which will be subtracted from the available fish habitat credit.

An example of how the credit use ledgers may be used is shown in Tables 18 and 19.

Table 18. Example LWCHP Advance Mitigation Wetland Credit Use Ledger[1]

Project Name: Lower Wapato Creek Habitat Advance Mitigation Project
Reference #s: Corps NWS-2021-XXXX-WRD, Ecology Order XXXX
Contact: Port of Tacoma, Mark Rettmann, mrettmann@portoftacoma.com, 253.592-6716

Submittal Date:	DATE		
Potential EEM Wetland Credits Available:	**6.27**	**EEM Wetland Credit Remaining Balance:**	**6.27**
Potential PFO Wetland Credits Available:	**3.08**	**PFO Wetland Credit Remaining Balance:**	**2.43**

Date	Project Name	Project Location	Corps Permit # (Issue Date)	Ecology Order # (Issue Date)	Local Permit # (Issue Date)	Impact Type (e.g., WL Category)	Impact Area (acres)	Use Ratio Applied	Wetland Credits Used	Comments / Remarks
8/11/2024	Project X	1234 5th St, Tacoma WA	NWS-2023-XX-WRD (MM/DD/2024)	XXXX (MM/DD/2024)	LPXXXX (MM/DD/2024)	PEM, Cat. III	0.35	1.85:1	0.65	LWCHP in Year 2. USACE and ECY approved Year 1 mon rpt on 7/15/2024.

[1] All numbers used in this ledger are for illustrative purposes only. Actual wetland credits may differ from those listed here.

Table 19. Example LWCHP Fish Habitat Credit Use Ledger

FISH HABITAT CREDITS (Wapato Creek Crossing Downstream of LWCHP Site)			
Transaction Date	**Location, Description, Agency/Permit Number**	**Debited Credits (Width [feet], Parallel to Flow)**	**Remaining Credits (Width [feet], Parallel to Flow)**
04/01/2022	Starting Value	-	60 feet
10/22/2024	Installation of bridge over Wapato Cr. at Port Parcel 15 WDFW HPA No. 2024-XYZ	20 feet	40 feet

12 Adaptive Management / Contingency Plan

The Port will conduct adaptive management and contingency planning (if needed) for the duration of the establishment period, during which performance standards are measured. As described in Section 10, maintenance activities will be the responsibility of the Port. The recommended maintenance activities will be identified during the informal inspections conducted by a qualified scientist on an annual basis.

During the first year of the establishment period (Monitoring Year 1), the Port will have all dead or failed plant materials replaced with plantings of the same species, size and location as the original planting zones. Replacement plantings, if required, will be installed during the dormant period (October through March) as practical.

While the native plant species selected for the LWCHP site are local, hardy and typically thrive in Pacific Northwest conditions, some individuals within the planted areas might perish (e.g., dry conditions). Temporary supplemental irrigation may be provided in the planted areas for the duration of the first two summers while the native plantings become established. The Port will inspect the temporary irrigation to ensure proper function.

During site visits, all observed litter including paper, plastic, bottles, construction debris, yard debris, etc. will be removed. In addition, stewardship actions will be conducted to control non-native, invasive and noxious vegetation, as described in Section 12.1.

In addition, the Port will monitor the site for damage due to anthropogenic disturbances (i.e., illegal dumping, illegal trespass, etc.) and will monitor site perimeters to ensure the site is not being degraded by anthropogenic activities. If anthropogenic disturbances are discovered, the Port will implement an adaptive management plan to make necessary repairs to the site.

12.1 Adaptive Management Plan

The Port's adaptive management plan outlines the maintenance activities that will be undertaken by the Port to ensure the long-term success of the LWCHP site. These maintenance activities will be identified during the spring walk-through survey and may include, but are not limited to, invasive vegetation removal, replanting or inter-planting with native species, over-seeding, and other maintenance actions deemed important to the overall success of the site. Maintenance and adaptive management activities conducted by the Port or its stewardship contractors will be summarized in the monitoring reports submitted to the permitting agencies.

Data collected during the spring walk-through surveys and during formal monitoring events will be used to inform the Port on the status of invasive vegetation within the LWCHP site. Patches of invasive vegetation will be identified as polygons and individual plants will be identified as points on a scaled map of the site for purposes of identifying the invasive vegetation during follow-up visits to implement control measures. Port personnel and/or a contracted stewardship coordinator will then conduct invasive vegetation removal, prior to plants going to seed. BMPs will be implemented and may include hand removal, herbicide application (e.g., injection, spot spraying, cut and daub, etc.), or other approved and permitted control measures. The Port utilizes numerous weed control methods depending on the type and number of weeds, their location, and other factors. In addition, to assist with weed management efforts, the Port utilizes its own Vegetation Management Manual, along with Pierce County Noxious Weed Control Board guidance. The

Port's weed control management procedures are flexible and include a wide range of control measures available for use depending on the specific conditions or situations at the time weed control is necessary.

Invasive vegetation includes noxious weed species listed in the most current noxious weed list issued by Pierce County and/or Washington State Noxious Weed Control Boards (Pierce County Noxious Weed Control Board 2020; Washington State Noxious Weed Control Board 2020).

Additional measures planned to prevent recolonization of noxious weeds after construction include spot treatments of hand pulling and herbicide applications. Mulching and/or covering may also be considered depending on the concentrations of weeds. Where noxious weeds occur in the understory or in proximity to native vegetation designated for preservation, special care will be taken to avoid application of herbicide on native vegetation, including use of backpack sprayers that can more accurately target desired weeds.

Areas where invasive vegetation has been removed may be replanted with native vegetation to prevent re-infestation. In the event that additional planting is necessary, plants will be installed during the dormant period from October through March, as practical.

The LWCHP site, including Wapato Creek, is designed to be a natural system and will be allowed to change, potentially creating several different hydraulically-driven habitat features. The site is not designed to be armored and confined to a specific area and orientation; however, if erosion or sloughing that creates a fish barrier or prevents the proper conveyance of the creek through the site is observed at any point, the Port will take steps to correct/modify the channel to prevent/minimize the potential for upstream flooding and/or re-establish fish passage. The steps to modify the channel may include, but are not limited to:

- Acquiring proper federal, state, and local permits for working in or near Wapato Creek and critical areas;
- Removing the eroded or sloughed material from the creek channel and recontouring the bank to stabilize the area from further erosion/sloughing;
- Replanting the bank with vegetation to establish a complex root system to help further stabilize the slope.

During the LWCHP design and data collection/modelling (stream, groundwater, water elevations/tidal inundation, and salinity) there were three culverts on Wapato Creek located downstream of the LWCHP that have impacts on the LWCHP design; two are owned by the Port and the other one is owned by WSDOT. The first downstream culvert from the site is the WSDOT culvert on SR 509. The Port anticipates WSDOT to replace the culvert on SR 509 located downstream of the LWCHP site during the 10-year performance monitoring period.

The next downstream culvert (north of SR 509) is the Port's Parcel 15 culvert. The Port is currently under construction to replace this culvert with a full span bridge in 2021. The final downstream culvert is the Wapato Creek outfall and is located across Alexander Avenue and the Port's Pierce County Terminal. There currently are no plans to replace this culvert at this time.

The existing culverts are undersized and constrict the tidal exchange between Wapato Creek and the Blair Waterway (Commencement Bay). Modelling indicates that the WSDOT SR 509 culvert is likely the controlling culvert of the three and will likely result in the most changes to the system when replaced. The new WSDOT culvert/bridge will remove the constriction which will potentially change the hydrologic regime within LWCHP. Anticipated hydrologic changes include

different tidal inundation, flow/backwater effects, and/or salinity concentrations or durations. The changes to hydrology may also impact plant communities (e.g., transition from salt-sensitive vegetation to salt-tolerant vegetation at higher elevations, mudflat to emergent or vice versa). The Port Parcel 15 culvert replacement, being conducted prior to the SR 509 replacement, is anticipated to have less effects to the Wapato Creek system upstream of SR 509.

The Port will observe any physical changes to the LWCHP site and document the changes in the corresponding monitoring report (e.g., if the WSDOT culvert is replaced during Year 6, the changes will be documented in the Year 7 monitoring report). If the Port's downstream outfall culvert is also replaced (not anticipated at this time), additional changes to the LWCHP site may also occur. The LWCHP design incorporates as much flexibility and resiliency as possible to anticipate these potential changes; this includes grading contours, overlapping seeding zones, seed mixes with a range of salt tolerance, and planting zones/distribution based on salt tolerances and water tolerances. Changes to the LWCHP site from replacing these culverts are expected and are anticipated to result in natural changes to the long-term plant communities and habitat types.

As discussed in Section 6, for the purposes of this AMP, the Cowardin classification for EEM will include both saltwater and freshwater tidal fringe. The design and site conditions may allow for a small area of freshwater tidal fringe to develop in the transition zone between the saltwater tidal fringe and the PFO or UPL areas. The side slopes between the anticipated saltwater tidal fringe and the PFO or UPL are designed to be steeper to limit the width/size of the freshwater tidal fringe transition zone. The freshwater tidal fringe area of the site is anticipated to be a small fraction of the EEM; therefore, the EEM includes both freshwater tidal fringe and saltwater tidal fringe.

If the extent of freshwater tidal fringe is equal to or greater than the extent of saltwater tidal fringe when evaluated at high tides during summer low flows of Wapato Creek, the Port will discuss with the Corps and Ecology how this may affect potential estuarine credit generation at the LWCHP site.

The Port and regulatory agencies can determine if additional adaptive management will be needed; or if changes to the performance standards or monitoring methods will be recommended to properly capture the LWCHP site's changing conditions.

12.2 Contingency Planning Procedure and Actions

This contingency plan identifies the planning process for selecting appropriate actions to address large-scale failure or anticipated failure of final success criteria for a specific objective. In order to maintain the flexibility needed to respond effectively and appropriately to biological and/or physical conditions, this plan does not present a complete list of actions that will be taken to remedy all types of failures at the LWCHP site. The list of corrective actions is not exhaustive or exclusive, nor is it a commitment to undertake a specific action.

Large-scale failure of biological components of the LWCHP is difficult to predict and specific responses are impossible to present in detail; however, the following general approaches can be applied:

- If planted vegetation (emergent, scrub-shrub and/or forested) fails to meet the canopy cover performance standards, additional planting may occur.
- If vegetation planted within the wetlands or buffer fail to meet the canopy cover standards due to incompatible hydrologic regime (i.e., too much or not enough water), additional

seeding or planting of different species more appropriate to the actual hydrologic regime may occur.

- If non-native, invasive weed species exceeds canopy cover standards despite adaptive management actions, large-scale planting with taller canopy species may occur to shade out invasives.

As outlined below, the contingency planning procedure is intended to be used to remedy larger, site-wide concerns. It is expected that any minor shortfall in achieving performance standards can be remedied through implementation of the Port's adaptive management plan. The contingency planning procedure consists of two elements: 1) problem recognition, and 2) planning and response.

12.2.1 Problem Recognition Process

The problem recognition process is an integral part of the monitoring program. As monitoring data are collected, the results will be examined and interpreted relative to the Project's objectives and performance standards. The purpose of this process is to determine if there is a potential problem, and if so, the nature and extent of the problem. Figure 15 outlines this process to show potential outcomes of the problem recognition step.

12.2.2 Planning and Response Process

The purpose of the contingency planning process is to develop actions that may be appropriate, depending on the results of the monitoring program and problem recognition step. If modified or continued monitoring and/or adaptive management is not adequate (e.g., reoccurring failure of achieving performance standards), the Port shall submit a contingency proposal for regulatory agency review and approval. Figure 16 outline the contingency planning process.

The contingency planning process could result in the implementation of an approved response action. Alternatively, it could result in agreement on an approach or set of criteria for taking further action, depending on the results of future monitoring. If necessary, the Port will propose a response action, based on best available information, and scientifically and economically feasible recommendations. The Port or permitting agencies can invite any resource agencies into contingency planning and response discussions. The Port and the permitting agencies shall meet in good faith and shall use their best efforts to reach consensus regarding an appropriate monitoring or contingency response. Potential responses include, but are not limited to, one or more of the following:

- Concluding that the situation does not require further action;
- Expanding or modifying the monitoring program;
- Developing more specific criteria to evaluate the data during future monitoring; and/or
- Initiating a corrective action.

13 Site Protection

Ecology and the Port intend to enter into an Agreed Order to establish the Lower Wapato Creek Habitat Project Advance Wetland Mitigation Site to provide compensation acreage and to develop a framework for using that acreage to compensate for unavoidable wetland impacts associated with future Port projects. The Agreed Order will define the scope of work of the LWCHP, including referencing this Advance Mitigation Plan. The Agreed Order will be valid until the monitoring period is complete, all wetland credits have been used, and Ecology has approved close out of the site.

The LWCHP site will be protected in perpetuity through implementation of a restrictive covenant, conservation easement or deed restriction on the use or alteration of the mitigation site. The restrictive covenant will be filed with the Pierce County Auditor and will include property restrictions/limitations, a legal description and site plan, and references to the permit numbers for the USACE permit, WDFW HPA, and City of Tacoma land use permit.

The Port will own and manage the LWCHP site in perpetuity unless ownership is transferred to local, state, or federal agencies; tribal governments; or private nonprofit nature conservancy corporations under RCW 47.12.370. If transferred, the mechanism for transfer will require that the site be maintained in a manner that complies with applicable permits, laws and regulations pertaining to the maintenance and operation of the mitigation site. If not, the site will revert back to Port ownership.

14 Long-Term Management and Maintenance

Once the LWCHP site has achieved Year 10 performance standards, it will be managed, along with the Port's other habitat and mitigation sites, in accordance with the Port's Habitat/Mitigation Site Stewardship procedure, located in Appendix D.

15 References

Canfield, R.H. 1941. Application of the line interception method in sampling range vegetation. Journal of Forestry 39:399-394.

Commencement Bay Natural Resource Trustees. 1997. Commencement Bay Natural Resource Damage Assessment Restoration Plan and Final Programmatic Environmental Impact Statement. Prepared by the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration for the Commencement Bay Natural Resource Trustees and Cooperating Agencies. February 1997.

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

Daubenmire, R.F. 1959. Canopy coverage method of vegetation analysis. Northwest Science 33:43-64.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Wetlands Research Program Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station. January 1987.

GeoEngineers. 2010. Site Investigation: Port of Tacoma Parcel 14, Tacoma, Washington. Prepared for Grette Associates LLC for Port of Tacoma. December 6, 2010.

GeoEngineers. 2018.Groundwater Monitoring Annual Summary, Lower Wapato Combined Habitat Project. January 11, 2018.

GeoEngineers. 2020. Lower Wapato Creek Habitat Project Floodplain Memo. Memorandum to Port of Tacoma. May 1, 2020.

GeoEngineers. 2021a. Salinity Monitoring Letter Report, Parcel 14 Lower Wapato Creek Habitat Project. January 7, 2021.

GeoEngineers. 2021b. Groundwater Seepage Modeling, Lower Wapato Creek Habitat Project. Memorandum to Port of Tacoma. January 2021.

Grette Associates. 2008. Blair-Hylebos Terminal Redevelopment Project, Revised Compensatory Freshwater Wetland Mitigation and Monitoring Plan – Conceptual. December 10, 2008.

Grette Associates. 2020. Port of Tacoma Off-Dock Container Yard and Stormwater Project Wetland Analysis Report. Prepared for Moffat & Nichol for Port of Tacoma, Tacoma, Washington. February 2020.

Kerwin, John. 1999. Salmon Habitat Limiting Factors Report for the Puyallup River Basin (Water Resource Inventory Area 10). Washington Conservation Commission. Olympia, Washington. July 1999.

King County. 2020. Animals, Plants and Habitat Biodiversity in King County, Washington: Ecoregions. Available online at: http://www.kingcounty.gov/environment/animals-and-plants/biodiversity/defining-biodiversity/ecoregions.aspx

Koski, K V. 2009. The fate of coho salmon nomads: the story of an estuarine-rearing strategy promoting resilience. *Ecology and Society* **14**(1): 4. [online] URL: http://www.ecologyandsociety.org/vol14/iss1/art4/

Levings, C. D., K. Conlin, and B. Raymond. 1991. Intertidal habitats used by juvenile Chinook salmon (Oncorhynchus tshawytscha) rearing in the north arm of the Fraser River estuary. Marine Pollution Bulletin 22:20-26.

Pater, D.E., S.A. Bryce, T.D. Thorson, J. Kagan, C. Chappell, J.M. Omernik, S.H. Azevedo, and A.J. Woods. 1998. Ecoregions of Western Washington and Oregon. (Map poster). U.S. Geological Survey, Reston, VA.

Pierce County Noxious Weed Control Board. 2020. Noxious Weeds Designated for Control or Eradciation in Pierce County. Retrieved from: http://piercecountyweedboard.org/index.php/noxious-weeds/weed-catagories. Accessed April 29, 2020.

Port of Tacoma. 2021. Project Update Memorandum, Joint Aquatic Resource Permit Application: HPA No. 22024, Corps No. NWS-2020-457-WRD, City of Tacoma No. LU20-0113; Lower Wapato Creek Habitat Project (LWCHP) Memorandum to Permitting Agencies. January 7, 2021.

Reed, P.B., Jr. 1988. National List of Plant Species That Occur in Wetlands: 1988 National Summary. U.S. Fish and Wildlife Service. Biological Report 88 (24).

Simenstad, C. A., K. L. Fresh, and E. O. Salo. 1982. The role of Puget Sound and Washington coastal estuaries in the life history of Pacific salmon: an unappreciated function. Pages 343-364 in V. S. Kennedy, editor. Estuarine Comparisons. Academic Press, New York.

U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). Wakeley, J.S., R.W. Lichvar, and C.V. Noble (Eds.). ERDC/EL TR-10-3. U.S. Army Corps of Engineers, U.S. Army Engineer Research and Development Center, Vicksburg, MS. May 2010.

U.S. Army Corps of Engineers, Washington State Department of Ecology, Washington Department of Fish and Wildlife. 2012. Interagency Regulatory Guide – Advance Permittee-Responsible Mitigation. Ecology Publication No. 12-06-015. December 2012. Retrieved from: https://fortress.wa.gov/ecy/publications/documents/1206015.pdf

U.S. Army Corps of Engineers. 2018. National Wetland Plant List, version 3.4. U.S. Army Corps of Engineers. Engineer Research and Development Center. Cold Regions Research and Engineering Laboratory, Hanover, NH. Retrieved from: http://wetland-plants.usace.army.mil/

Washington State Department of Ecology. 2009. Selecting Wetland Mitigation Sites Using a Watershed Approach. Washington State Department of Ecology. Ecology Publication No. 09-06-032. December 2009. Retrieved from: https://fortress.wa.gov/ecy/publications/documents/0906032.pdf

Washington State Department of Ecology. 2019. 2019 Stormwater Management Manual for Western Washington (SWMMWW). Ecology Publication No. 19-10-021. July 2019. Retrieved from:

https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMWW/Content/Resources/DocsForDownload/2019SWMMWW.pdf.

Washington State Department of Ecology. 2020. Washington State Water Quality Atlas. Retrieved from: https://fortress.wa.gov/ecy/waterqualityatlas/map.aspx. Accessed April 23, 2020.

Washington State Department of Ecology and U.S. Army Corps of Engineers. 2013. Credit Guide for Wetland Mitigation Banks. Published by Washington State Department of Ecology Shorelands and Environmental Assistance Program and U.S. Army Corps of Engineers, Seattle District, Regulatory Branch. Ecology Publication No. 12-06-014. February 2013. Retrieved from: https://fortress.wa.gov/ecy/publications/documents/1206014.pdf

Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. 2006a. Wetland Mitigation in Washington State – Part 1: Agency Policies and Guidance (Version 1). Published by Washington State Department of Ecology Shorelands and Environmental Assistance Program, Olympia, Washington. Ecology Publication #06-06-011b. Olympia, WA. March 2006. Retrieved from: https://fortress.wa.gov/ecy/publications/documents/0606011a.pdf

Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. 2006b. Wetland Mitigation in Washington State – Part 2: Developing Mitigation Plans (Version 1). Published by Washington State Department of Ecology Shorelands and Environmental Assistance Program, Olympia, Washington. Ecology Publication No. 06-06-011a. March 2006. Retrieved from: https://fortress.wa.gov/ecy/publications/documents/0606011b.pdf

Washington Department of Fish and Wildlife (WDFW). 2019. WDFW Fish Passage and Diversion Screening Inventory Database. October 1, 2019. Retrieved from: http://apps.wdfw.wa.gov/fishpassagephotos/Reports/105%20R121420a_Report.pdf

Washington Department of Fish and Wildlife (WDFW). 2020a. PHS on the Web. Retrieved from http://apps.wdfw.wa.gov/phsontheweb/. Accessed April 24, 2020.

Washington Department of Fish and Wildlife (WDFW). 2020b. WDFW Salmonscape Database. Retrieved from: http://apps.wdfw.wa.gov/salmonscape/map.html. Accessed April 23, 2020.

Washington Department of Natural Resources (DNR). 2019. Forest Practices Application Mapping Tool (Stream Typing). Retrieved from: https://fpamt.dnr.wa.gov/default.aspx#.

Washington State Department of Transportation (WSDOT). 2016. SR 167 – Puyallup to SR 509 Tier II (Final) Environmental Impact Statement. Retrieved from: https://www.wsdot.wa.gov/sites/default/files/2006/10/04/Chapter32WaterResourcesPages1741.pdf.

Washington State Noxious Weed Control Board. 2020. 2020 Washington State Noxious Weed List. Retrieved from: https://www.nwcb.wa.gov/pdfs/2020-State-Weed-List_Common_Name-8.5x11.pdf. Accessed on April 29, 2020.

The Watershed Company. 2012. Biological Assessment: Potential Sensitive Fish and Wildlife Species Impacts of Proposed Lower Wapato Combined Habitat Project and Drainage District 23 Ditch Alterations. Prepared for Port of Tacoma, Tacoma, Washington. December 6, 2012.

APPENDIX A – FIGURES

FIGURE 1. Vicinity Map

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

Legend

Project Area

N
W E
S

1 0 1 Miles

Port of Tacoma

GeoEngineers

MOTT MACDONALD

SiteWorkshop LANDSCAPE ARCHITECTURE

Document Name: Fig1_VM 5/8/2020 8:30:19 AM smm

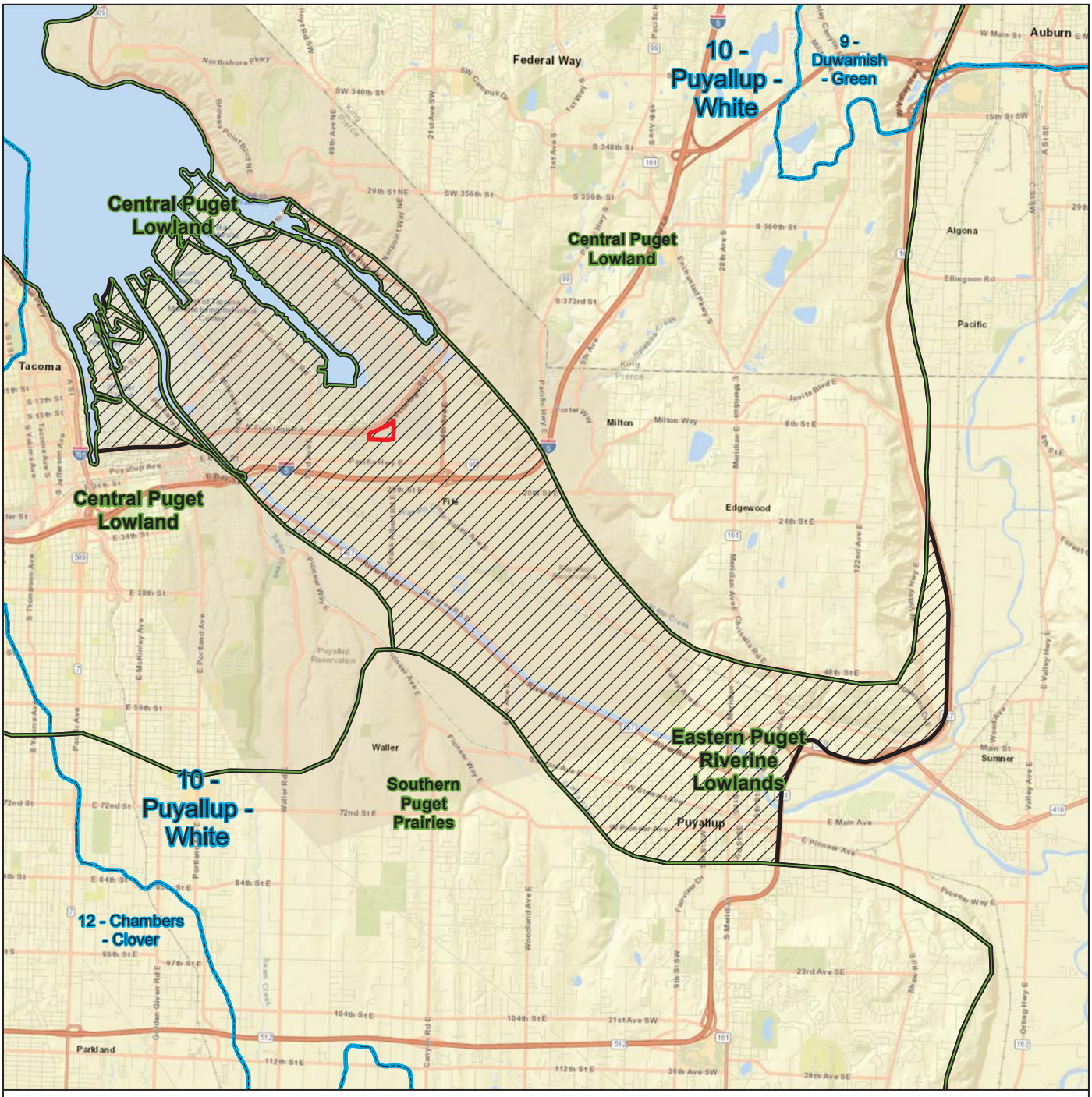

FIGURE 2. Geographic Service Area

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

Legend

- Project Site
- Geographic Service Area
- Ecoregions
- Water Resource Inventory Areas

N W E S

8,000 0 8,000

Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: ESRI, DeLorme, USGS, Intermap

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Port of Tacoma | GeoEngineers | Mott MacDonald | SiteWorkshop Landscape Architecture

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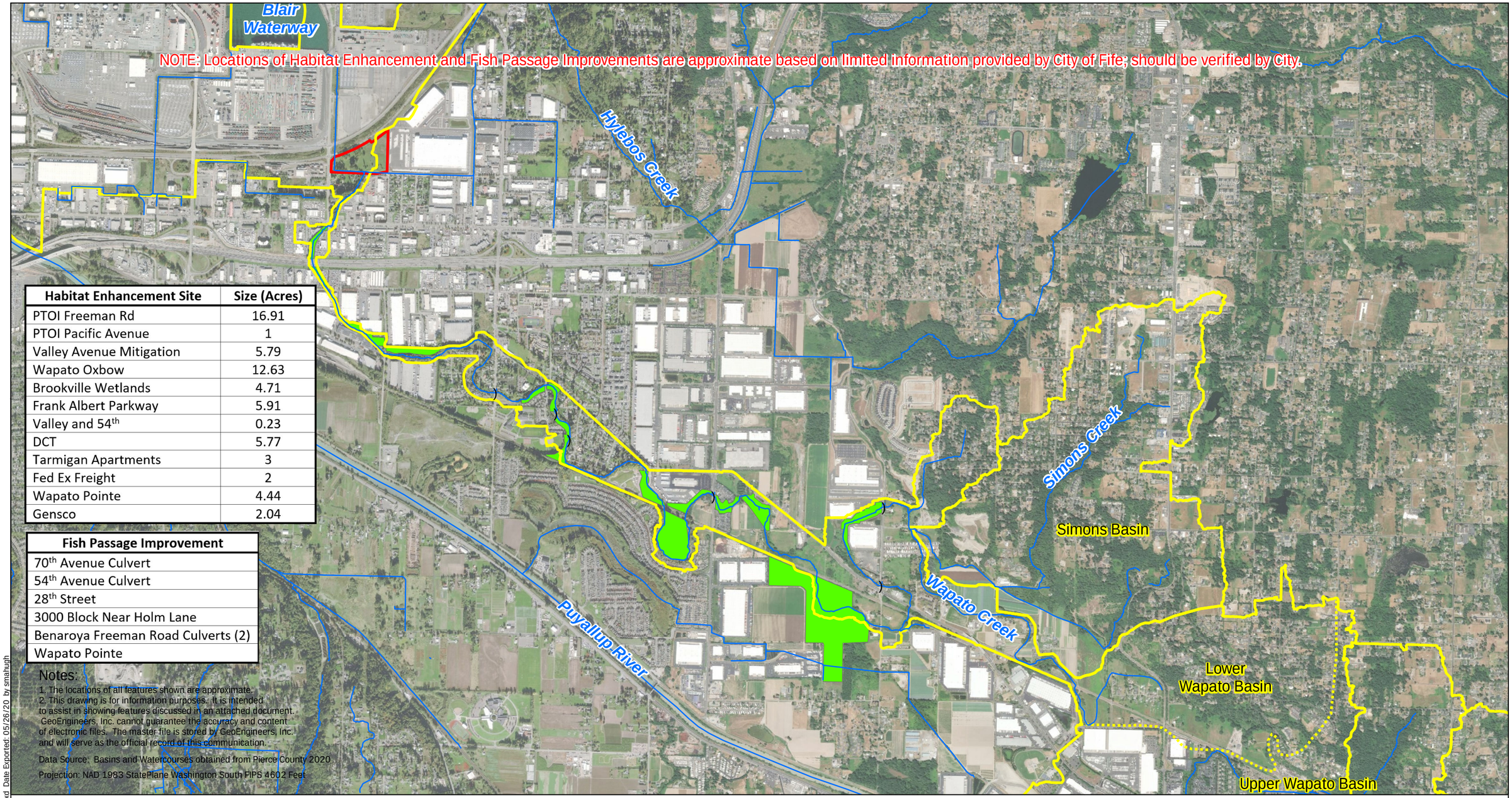

Habitat Enhancement Site	Size (Acres)
PTOI Freeman Rd	16.91
PTOI Pacific Avenue	1
Valley Avenue Mitigation	5.79
Wapato Oxbow	12.63
Brookville Wetlands	4.71
Frank Albert Parkway	5.91
Valley and 54th	0.23
DCT	5.77
Tarmigan Apartments	3
Fed Ex Freight	2
Wapato Pointe	4.44
Gensco	2.04

Fish Passage Improvement
70th Avenue Culvert
54th Avenue Culvert
28th Street
3000 Block Near Holm Lane
Benaroya Freeman Road Culverts (2)
Wapato Pointe

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Basins and Watercourses obtained from Pierce County 2020

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

C:\Users\smahugh\AMP Watershed NO TB.mxd Date Exported: 05/26/20 by smahugh

FIGURE 3. Wapato Creek Watershed

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

2,000 0 2,000 Feet

N W E S

Legend
- Project Area
- Habitat Enhancement (Approximate)
- Fish Passage Improvement (Approximate)
- Watercourses
- Basins
- Approximate Lower Wapato Basin Boundary

Port of Tacoma

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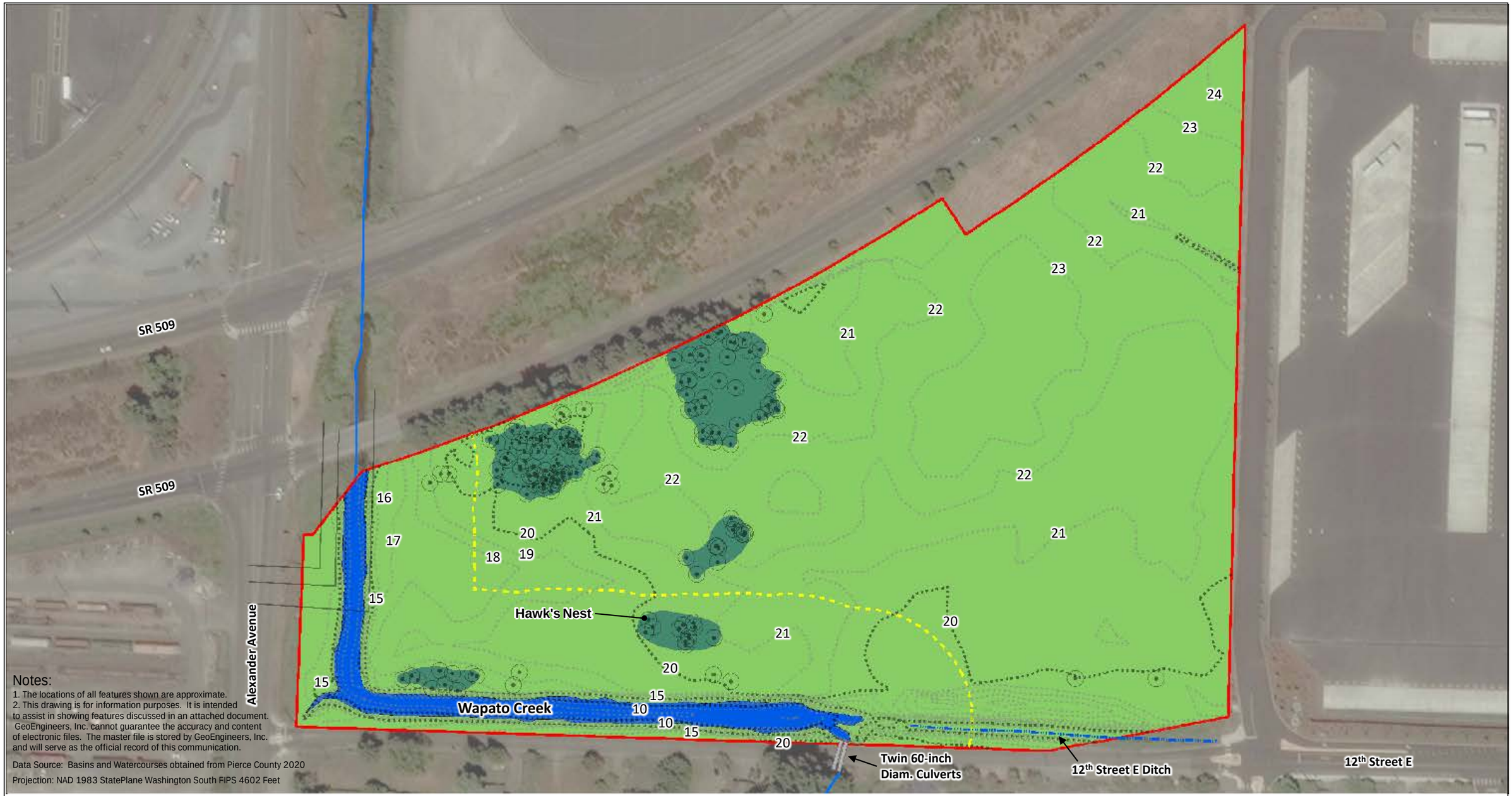
MM MOTT MACDONALD SiteWorkshop LANDSCAPE ARCHITECTURE



Notes:

1. The locations of all features shown are approximate.
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Data Source: Basins and Watercourses obtained from Pierce County 2020

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

FIGURE 4. Existing Conditions

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

100 0 100
Feet

N
W E
S

Legend

- Project Area
- **Habitat Types**
- Upland Grasses with Invasive
- Upland Forested with Invasive Understory
- Wapato Creek (Approx. OHW/HTL)
- 12th Street Ditch Centerline
- Wapato Creek 150' Buffer
- Existing Tree
- 1-Foot Contours
- 5-Foot Contours

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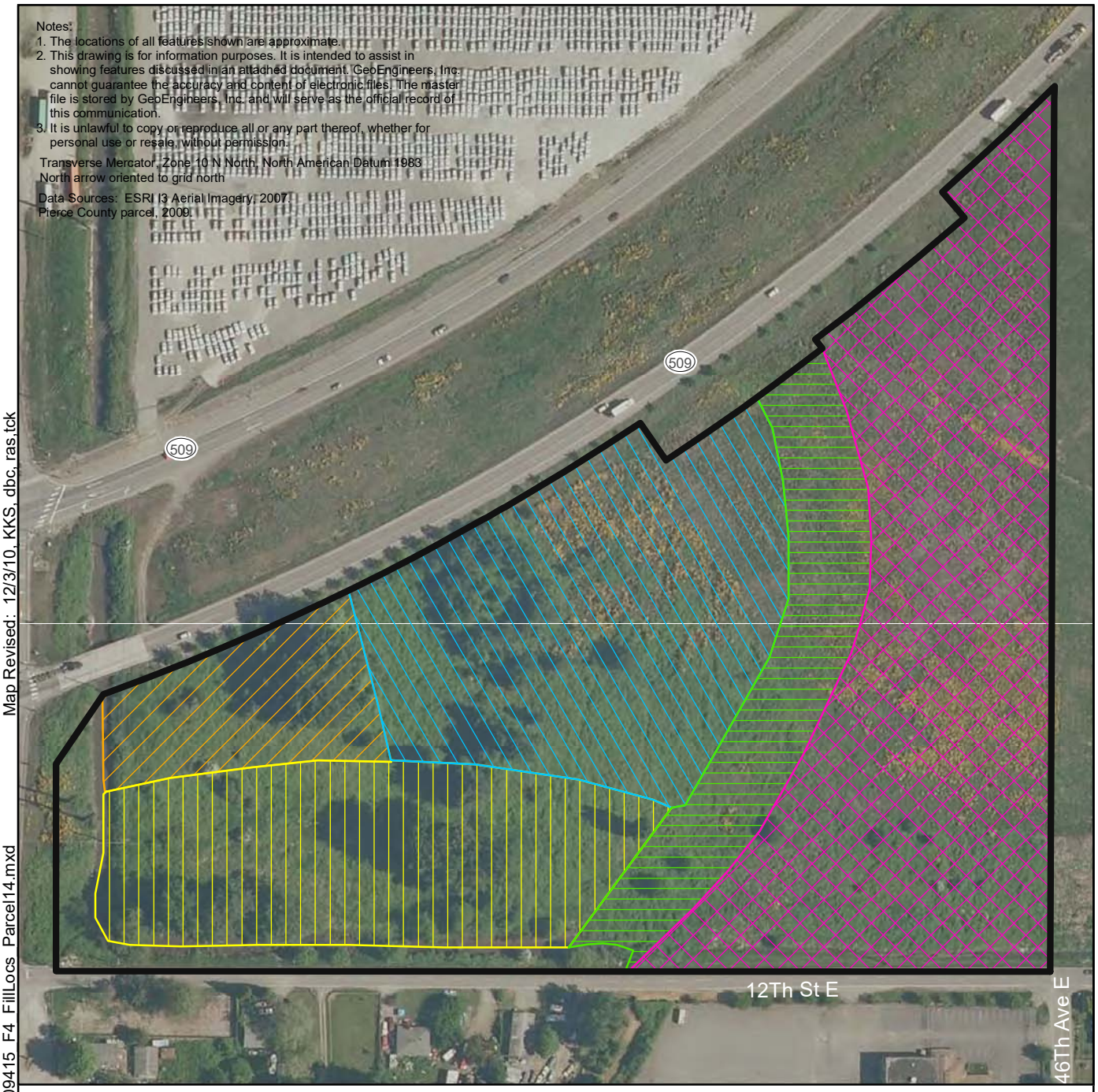

Map Revised: 12/3/10, KKS, dbc, ras,tck

Path: \\Tac\projects\0\04540\94\GIS\045409415 F4 FillLocs Parcel14.mxd

Office: TAC

FIGURE 5. Approximate Fill Locations, Thicknesses and Sources

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

Legend

- Hydraulic fill, generally 4 to 6 feet thick
- Hydraulic fill, generally 6 to 12 feet thick
- Hydraulic fill/PORTAC fill, generally 3 to 5 feet thick
- Unknown fill source, generally 4 to 5 feet thick
- No fill, mature soil at ground surface
- Site Boundary

N W E S

200 0 200 Feet

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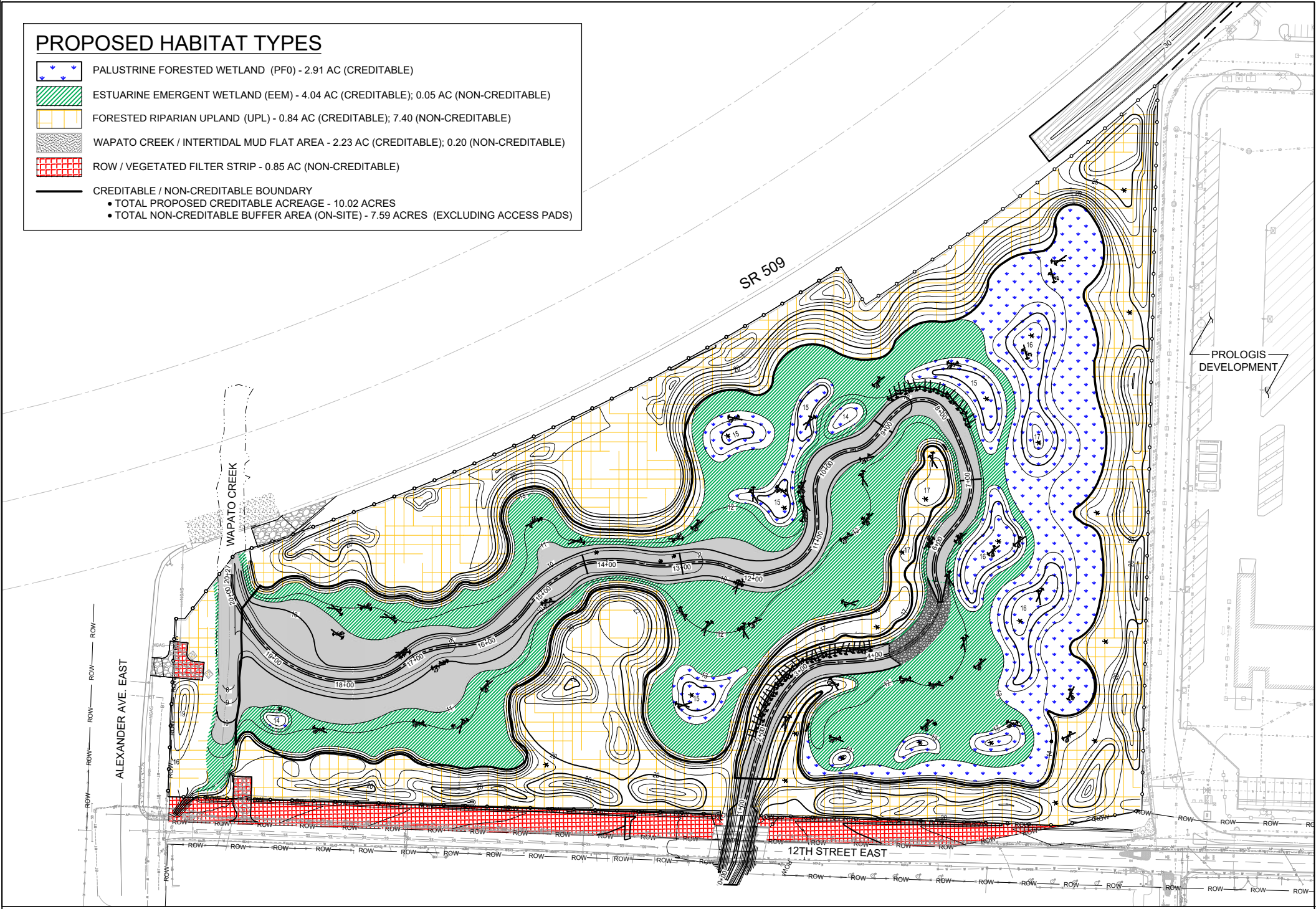

FIGURE 6. PROPOSED HABITAT TYPES

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

0 80' 160' 320'

LEGEND

PROPOSED CONTOUR

NEW STREAM CENTERLINE

SNAG

LARGE WOODY MATERIAL

Port of Tacoma

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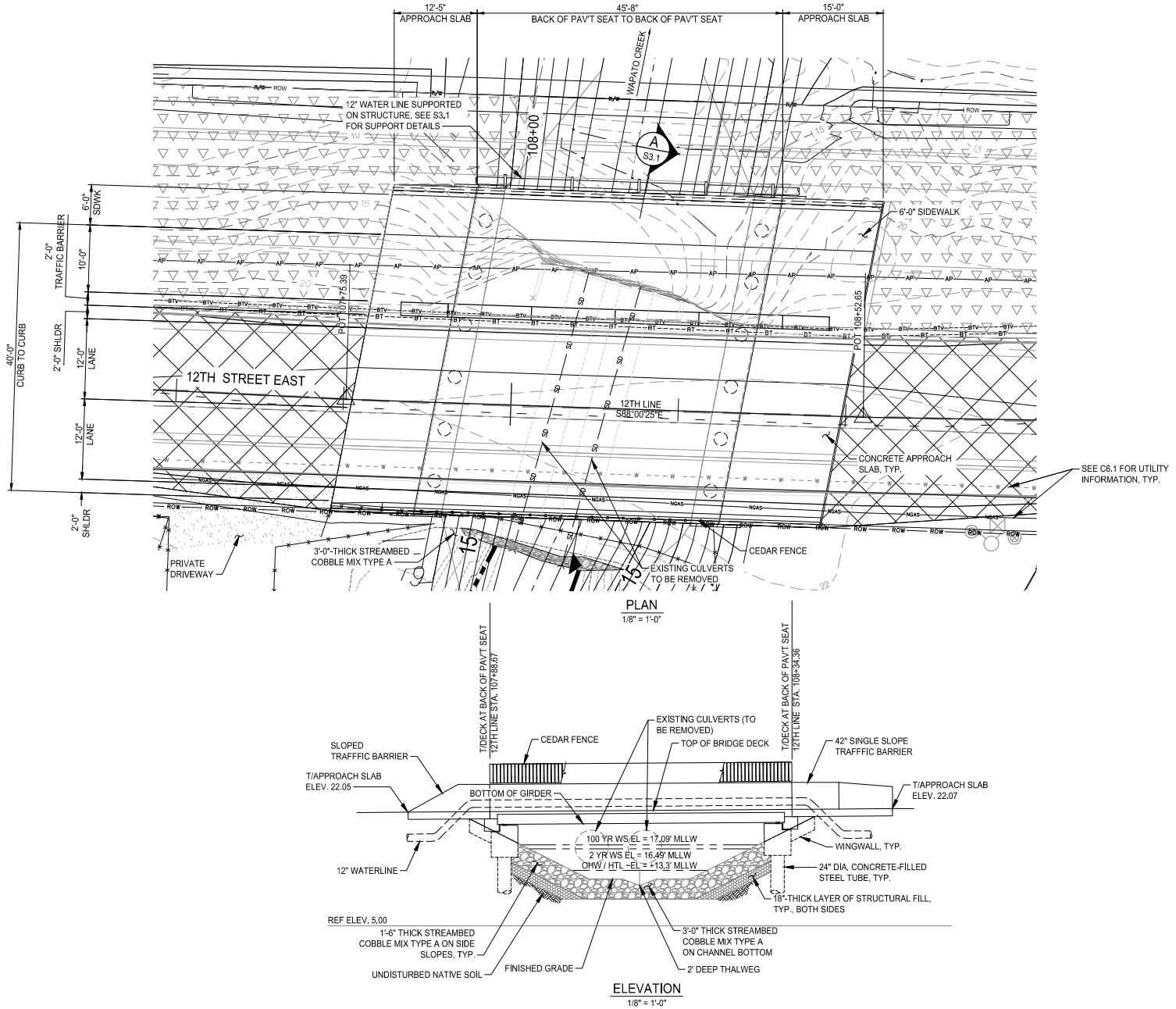

FIGURE 7. 12TH STREET EAST BRIDGE CROSSING

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

LEGEND

EXISTING CONTOUR

PROPOSED CONTOUR

#+## NEW STREAM CENTERLINE

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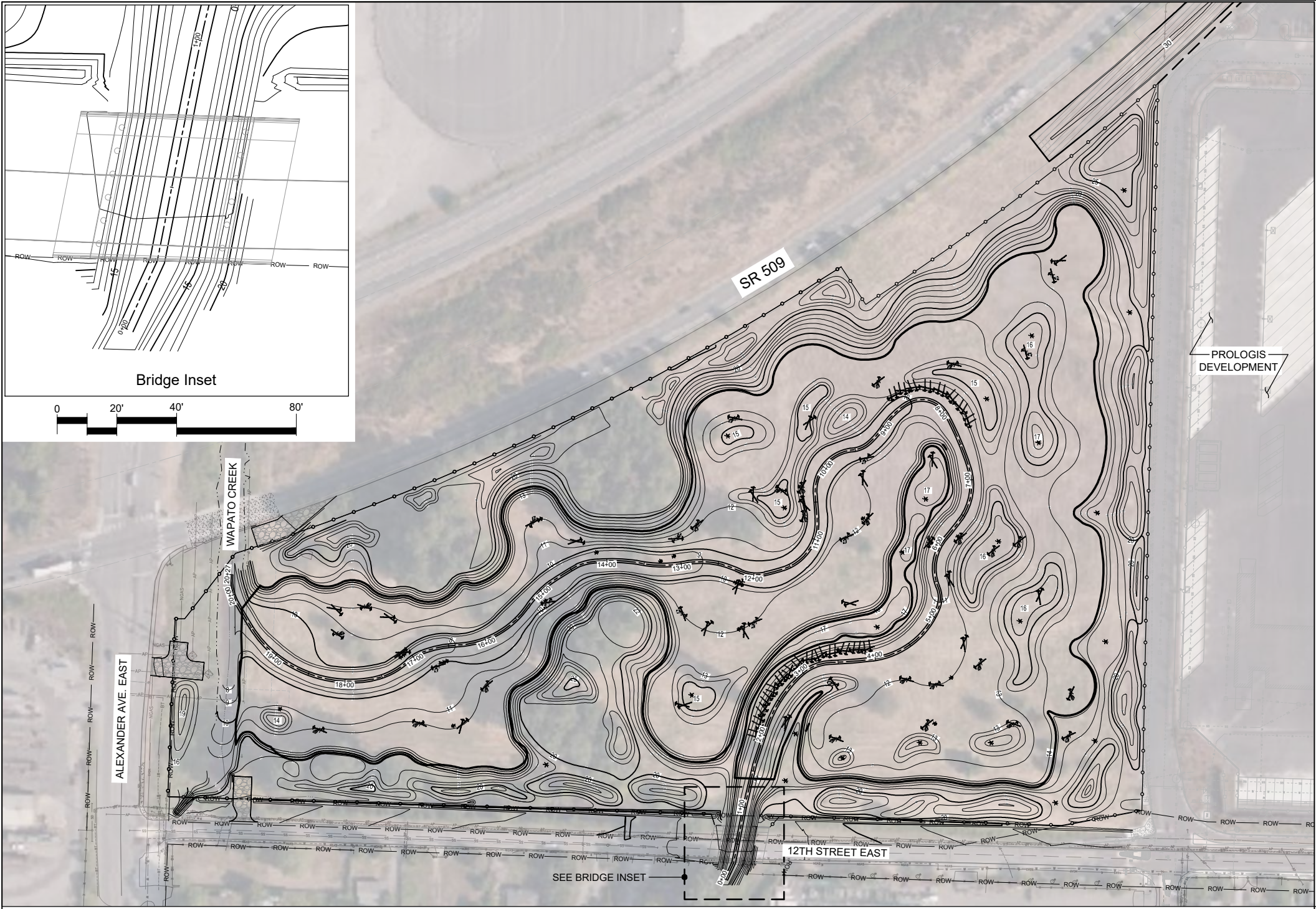

FIGURE 8. GRADING PLAN

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

LEGEND

- PROPOSED CONTOUR
- NEW STREAM CENTERLINE
- SNAG
- LARGE WOODY MATERIAL

Port of Tacoma

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PROPOSED CUT AND FILL RANGES (IN FEET)		
MIN ELEVATION	MAX ELEVATION	COLOR
-16.00	-12.00	
-12.00	-10.00	
-10.00	-8.00	
-8.00	-6.00	
-6.00	-4.00	
-4.00	-2.00	
-2.00	0.00	
0.00	2.00	
2.00	4.00	
4.00	6.00	
6.00	8.00	
8.00	10.00	
10.00	12.00+	

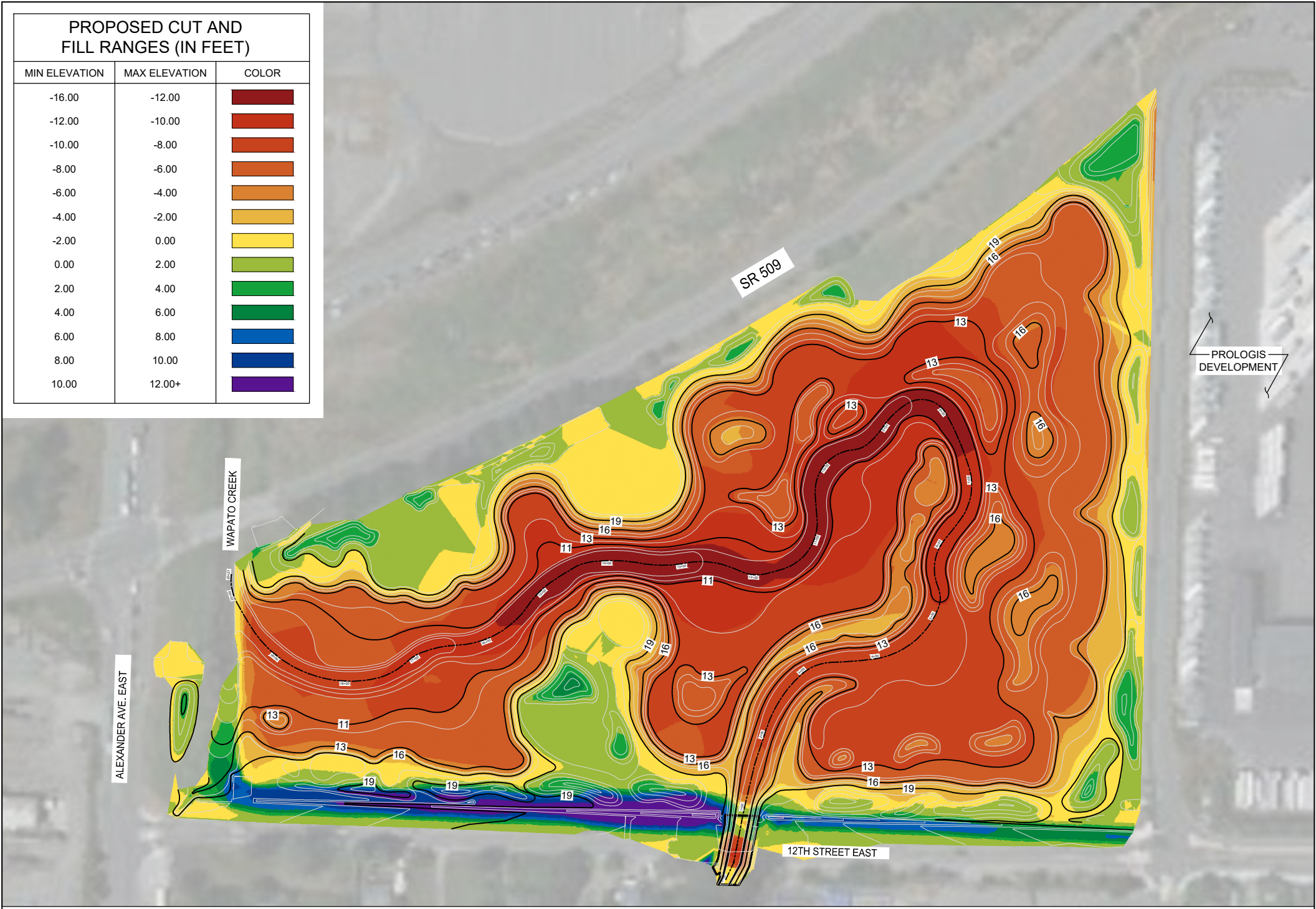

FIGURE 9. GRADING PLAN HEAT MAP

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

0 80' 160' 320'

LEGEND

- # — PROPOSED CONTOUR
- #+## — NEW STREAM CENTERLINE
- SNAG
- LARGE WOODY MATERIAL

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SEED SCHEDULE

(ALL DISTURBED SOIL AREAS ABOVE ELEVATION 11 TO BE SEEDED)

UPPER SEED MIX	LBS PER AC	TOTAL LBS
9.0 AC TOTAL		
ACHILLEA MILLEFOLIUM / WHITE YARROW	0.50	4.50
ELYMUS GLAUCUS / BLUE WILDRYE	10.00	90.00
ERIGERON SPECIOSUS / SHOWY FLEABANE	0.50	4.50
LUPINUS POLYPHYLLUS / BIGLEAF LUPINE	4.00	36.00
LUPINUS BICOLOR / TWO COLOR LUPINE	4.00	36.00
HORDEUM BRACHYANTHERUM / MEADOW BARLEY	8.00	72.00
TRITICUM AESTIVUM / STERILE WHEAT	7.00	63.00
GRASS (REGREEN ™ OR EQUAL)	3.00	27.00
POA SANDBERGII / CANBY BLUEGRASS	0.25	2.25
ARTEMISIA SUKSDORFII	0.05	0.45
ANAPHALIS MARGARITACEA	0.12	1.08
ERIOPHYLLYM LANATUM	1.00	9.00
LUPINUS LITTORALIS	0.05	4.50
FRAGARIA CHILOENSIS	0.03	0.27
AMBROSIA CHAMISSONIS	0.70	6.30
GRINDELIA INTEGRIFOLIA	0.09	0.81
POTENTILLA PACIFICA	0.30	2.70
PRUNELLA VULGARIS VAR. LANCEOLATA	0.25	
SIDALCEA HENDERSONII	0.03	
ASTER SUBSPICATUS	2.00	
DESCHAMPSI CESPITOSA	0.16	
PLECTRITIS CONGESTA		

EMERGENT SEED MIX	LBS PER AC	TOTAL LBS
4.1 AC TOTAL		
CAREX LYNGBYEI / LYNDBY'S SEDGE	3.00	12.30
CAREX OBNUPTA / SLOUGH SEDGE	3.60	14.76
CAREX STIPATA / AWLFRUITED SEDGE	1.20	4.92
ELEOCHARIS PALUSTRIS / COMMON SPIKE RUSH	1.20	4.92
JUNCUS ACUMINATUS / TAPERED RUSH	0.06	0.25
JUNCUS BALTICUS / BALTIC RUSH	1.20	4.92
JUNCUS ENSIFOLIUS / DAGGERLEAF RUSH	0.06	0.25
SCIRPUS ACUTUS / HARDSTEM BULRUSH	3.20	13.12
SCIRPUS AMERICANUS / TULE	2.40	9.84
SCIRPUS MARITIMUS / SALTMARSH BULRUSH	3.00	12.30

LOWER SEED MIX	LBS PER AC	TOTAL LBS
2.9 AC TOTAL		
BROMINUS CARINATUS / CALIFORNIA BROME GRASS	3.00	8.70
ELYMUS GLAUCUS / BLUE WILDRYE	3.00	8.70
POA SANBERGII / CANBY BLUEGRASS	2.00	5.80
GLYCERIA OCCIDENTALIS / WESTERN MANNA GRASS	4.00	11.16
DECHAMPSIA CAESPITOSA / TUFTED HAIR GRASS	3.00	8.70
ELEOCHARIS PALUSTRIS / COMMON SPIKE RUSH	4.00	11.16
CAREX OBNUPTA / SLOUGH SEDGE	5.00	14.50
GRINDELIA INTEGRIFOLIA	0.35	1.02
POTENTILLA PACIFICA	0.09	0.26
SIDALCEA HENDERSONII	0.50	1.45
ASTER SUBSPICATUS	0.05	0.15
LATHYRUS MARITIMUS	0.50	1.45
LATHYRUS LITTORALIS	0.50	1.45
PLECTRITIS CONGESTA	0.16	0.46

LEGEND

- EMERGENT SEED MIX
- LOWER SEED MIX
- UPPER SEED MIX

*PRIOR TO SEEDING, REMOVE ALL INVASIVE VEGETATION WHILE PRESERVING EXISTING TREE ROOTS

NOTES

1. COVER ALL SEEDED AREAS WITH JUTE MAT (SEE SPECS)

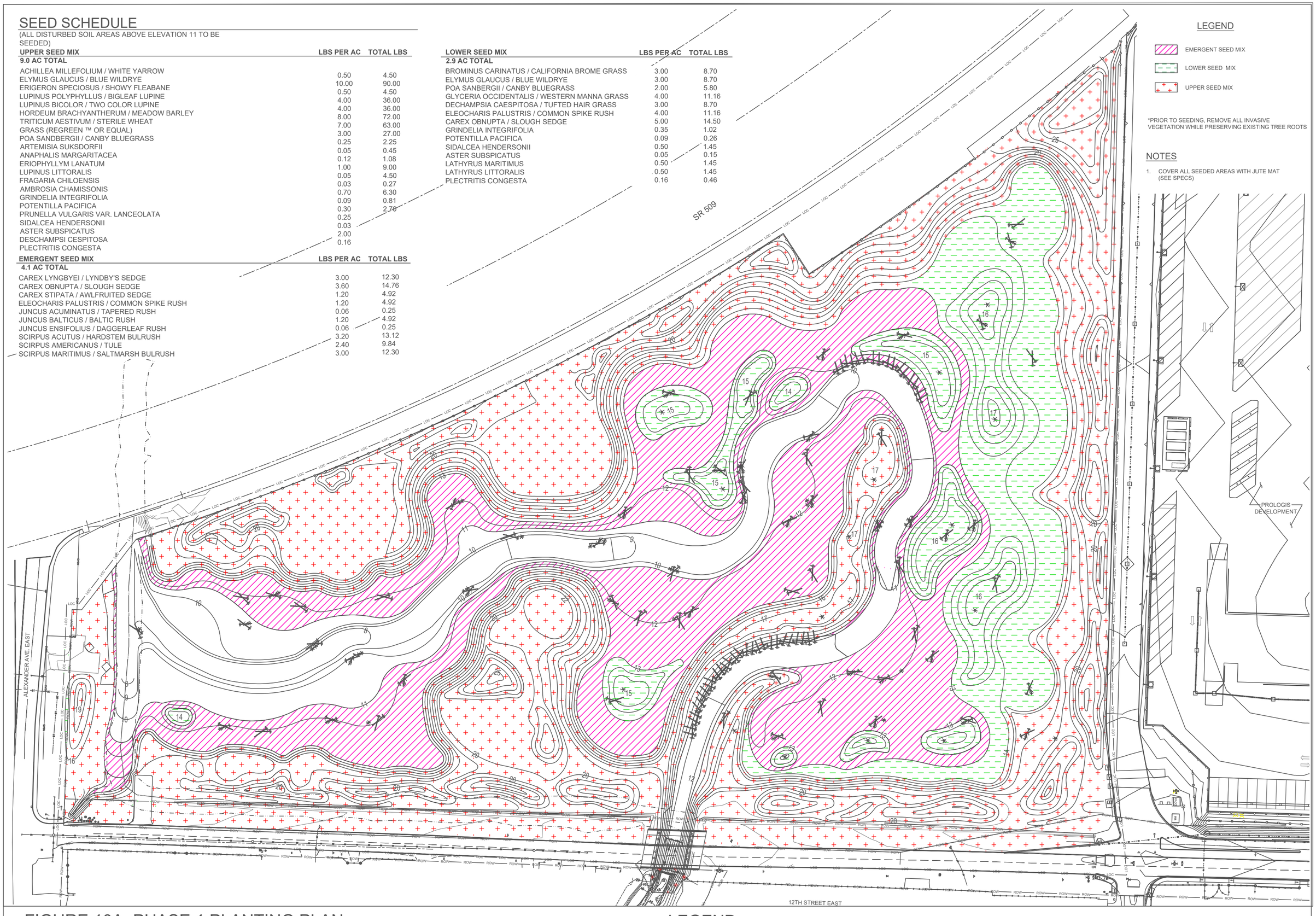

FIGURE 10A. PHASE 1 PLANTING PLAN

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

0 40' 80' 160'

LEGEND

- # PROPOSED CONTOUR
- NEW STREAM CENTERLINE
- #+## SNAG
- LARGE WOODY MATERIAL

Port of Tacoma

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SiteWorkshop LANDSCAPE ARCHITECTURE

LEGEND

- CONTRACTOR STAGING
- SITE PERIMETER FENCE
- DOUBLE SWING GATE (TRUCK ACCESS)
- 5' WIDE PEDESTRIAN GATE
- LIMIT OF CONSTRUCTION
- EXISTING TREE

PLANTING ZONES

- UPLAND ZONE
- SUPPLEMENTAL UNDERSTORY PLANTING ZONE
- WETLAND PALUSTRINE FORESTED ZONE
- TRANSITIONAL PLANTING ZONE
- WETLAND EMERGENT ZONE

NO TREES IN THIS AREA

SR 509

PROLOGIS DEVELOPMENT

ALEXANDER AVE. EAST

12TH STREET EAST

FIGURE 10B. PHASE 2 PLANTING PLAN

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

0 40' 80' 160'

LEGEND

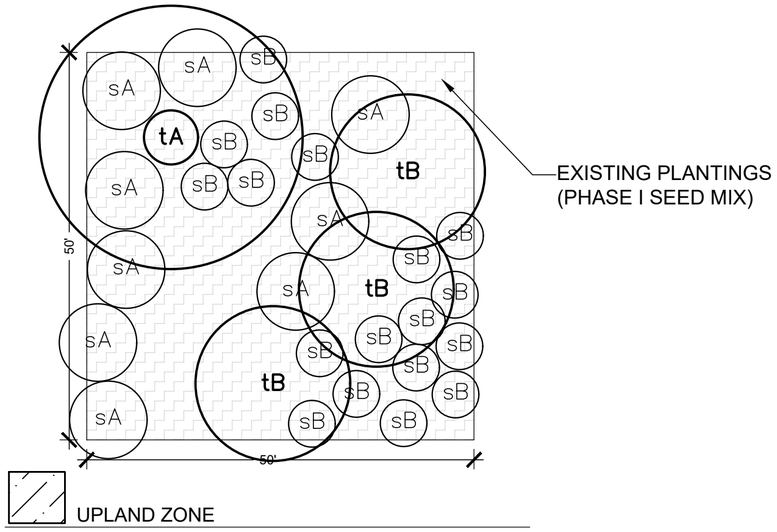
- # PROPOSED CONTOUR
- #+## NEW STREAM CENTERLINE
- SNAG
- LARGE WOODY MATERIAL

Port of Tacoma

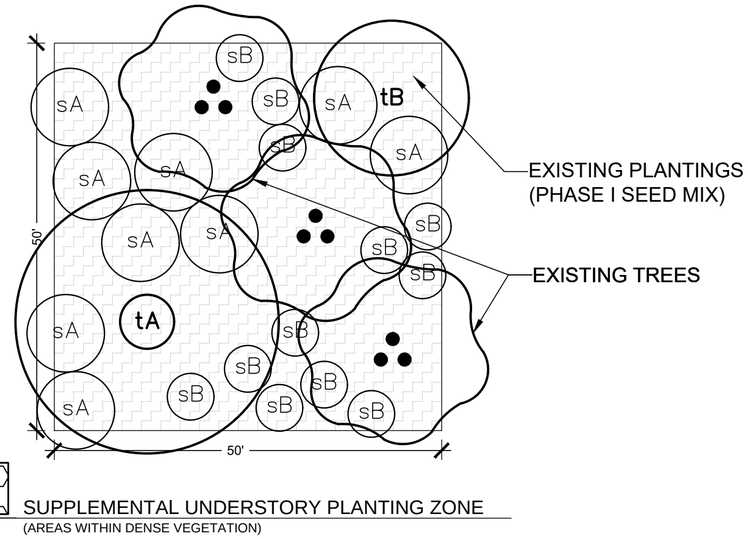
MOTT MACDONALD

GeoEngineers

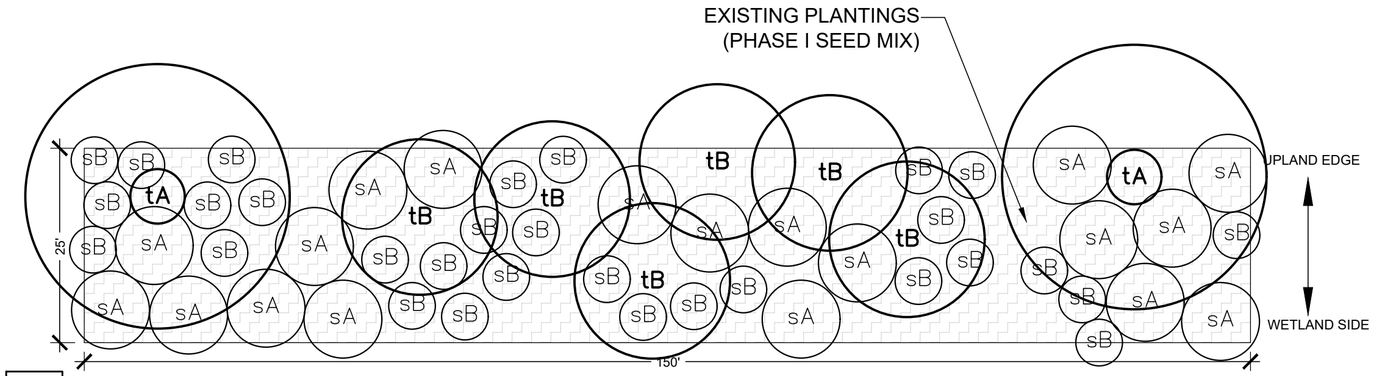
SiteWorkshop LANDSCAPE ARCHITECTURE



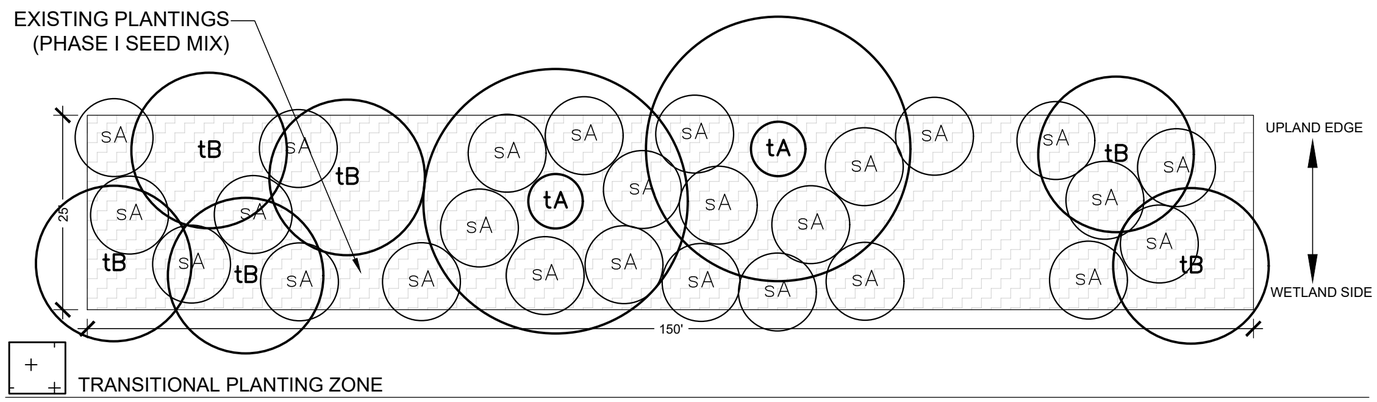
UPLAND ZONE



SUPPLEMENTAL UNDERSTORY PLANTING ZONE
(AREAS WITHIN DENSE VEGETATION)



WETLAND PALUSTRINE FORESTED ZONE



TRANSITIONAL PLANTING ZONE

FIGURE 11. TREE AND SHRUB PLANTING ZONES

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

Port of Tacoma

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SiteWorkshop
LANDSCAPE ARCHITECTURE

SCIENTIFIC / COMMON NAME	TYPE	ZONE	QTY	SIZE
tB ALNUS RUBRA RED ALDER	Tree-B	SUP, U, T	204	10 CU. IN. PLUG
tB FRAXINUS LATIFOLIA OREGON ASH	Tree-B	T, W	255	10 CU. IN. PLUG
tA PICEA SITCHENSIS SITKA SPRUCE	Tree-A	T, W	70	10 CU. IN. PLUG
tA POPULUS BALSAMIFERA BLACK COTTONWOOD	Tree-A	SUP, U	38	10 CU. IN. PLUG
tB PSEUDOTSUGA MENZIESII DOUGLAS-FIR	Tree-B	SUP, U	106	10 CU. IN. PLUG
tA THUJA PLICATA WESTERN RED CEDAR	Tree-A	SUP, U, T, W	11	10 CU. IN. PLUG

SHRUBS	TYPE	ZONE	QTY	SIZE
sB ACER CIRCINATUM VINE MAPLE	Shrub-B	SUP, U	442	10 CU. IN. PLUG
sA CORNUS SERICEA RED TWIG DOGWOOD	Shrub-A	W	94	10 CU. IN. PLUG
sB CORYLUS CORNUTA WESTERN HAZELNUT	Shrub-B	SUP, U	442	10 CU. IN. PLUG
sA CRATAEGUS DOUGLASII BLACK HAWTHORN	Shrub-A	T, W	369	10 CU. IN. PLUG
sB LONICERA INVOLUCRATA BLACK TWINBERRY	Shrub-B	W	249	10 CU. IN. PLUG
sB MAHONIA AQUIFOLIUM TALL OREGON GRAPE	Shrub-B	SUP, U	444	10 CU. IN. PLUG
sA MALUS FUSCA WESTERN CRABAPPLE	Shrub-A	SUP, U	177	10 CU. IN. PLUG
sA PHYSOCARPUS CAPITATUS PACIFIC NINEBARK	Shrub-A	T, W	369	10 CU. IN. PLUG
sA ROSA GYMNOCARPA BALDHIP ROSE	Shrub-A	SUP, U	177	10 CU. IN. PLUG
sA ROSA NUTKANA NOOTKA ROSE	Shrub-A	T, W	369	10 CU. IN. PLUG
sA ROSA PISOCARPA PEA-FRUIT ROSE	Shrub-A	SUP, U, T	452	10 CU. IN. PLUG
sA SPIRAEA DOUGLASII HARDHACK	Shrub-A	W	95	10 CU. IN. PLUG
sA SYMPHORICARPOS ALBUS SNOWBERRY	Shrub-A	SUP, U, T	452	10 CU. IN. PLUG

LIVE CUTTINGS	TYPE	ZONE	QTY	SIZE
sB SALIX HOOKERIANA HOOKER'S WILLOW	Shrub-B	W	1240	FIVE (5) 3/4 - 1 1/2" DIA., 36" MIN. LENGTH
tA SALIX LUCIDA PACIFIC WILLOW	Tree-A	W	80	FIVE (5) 3/4 - 1 1/2" DIA., 36" MIN. LENGTH
sB SALIX SITCHENSIS SITKA WILLOW	Shrub-B	W	1240	FIVE (5) 3/4 - 1 1/2" DIA., 36" MIN. LENGTH
tB SALIX SCOULERIANA SCOULER'S WILLOW	Tree-B	T	530	FIVE (5) 3/4 - 1 1/2" DIA., 36" MIN. LENGTH

EMERGENTS – SPACED 24 INCHES O.C.	ZONE	QTY	SIZE
CAREX LYNGBYEI LYNDBY'S SEDGE	E	6866	10 CU. IN. PLUG
CAREX OBNUPTA SLOUGH SEDGE	E	6866	10 CU. IN. PLUG
CAREX STIPATA AWLFRUITED SEDGE	E	6866	10 CU. IN. PLUG
ELEOCHARIS PALUSTRIE CREEPING SPIKERUSH	E	6866	10 CU. IN. PLUG
JUNCUS ACUMINATUS TAPERED RUSH	E	6866	10 CU. IN. PLUG
JUNCUS ENSIFOLIUS DAGGERLEAF RUSH	E	6866	10 CU. IN. PLUG
SCIRPUS ACUTUS HARDSTEM BULRUSH	E	6866	10 CU. IN. PLUG
SCIRPUS AMERICANUS TULE	E	6866	10 CU. IN. PLUG
SCIRPUS MARITIMUM SALTMARSH BULRUSH	E	6866	10 CU. IN. PLUG

SCHEDULE KEY

ZONES
SUP: SUPPLEMENTAL UNDERSTORY PLANTING
U: UPLAND
T: TRANSITIONAL
W: WETLAND PALUSTRINE FORESTED
E: WETLAND EMERGENT

Tree-A: SPREADING-TYPE TREE
Tree-B: GROUPING-TYPE TREE
Shrub-A: SPREADING-TYPE SHRUB
Shrub-B: GROUPING-TYPE SHRUB

NOTE: EACH QUANTITY OF LIVE CUTTINGS CONSITS OF FIVE INDIVIDUAL LIVE CUTTINGS SPACED 1' O.C.

NOTE: PLANT LAYOUT, QUANTITY, SIZES, & SPACING SUBJECT TO FURTHER REFINEMENT

FIGURE 12. TREE AND SHRUB PLANTING SCHEDULE

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

Port of Tacoma
MOTT MACDONALD
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Map Revised: 1/04/18, alw

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Office: TAC

FIGURE 13. Monitoring Well Locations

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

Legend

MW-1 Monitoring Well Number and Approximate Location

Stream

Site Boundary

N
W E
S

200 0 200

Feet

Port of Tacoma

GeoEngineers

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SiteWorkshop LANDSCAPE ARCHITECTURE

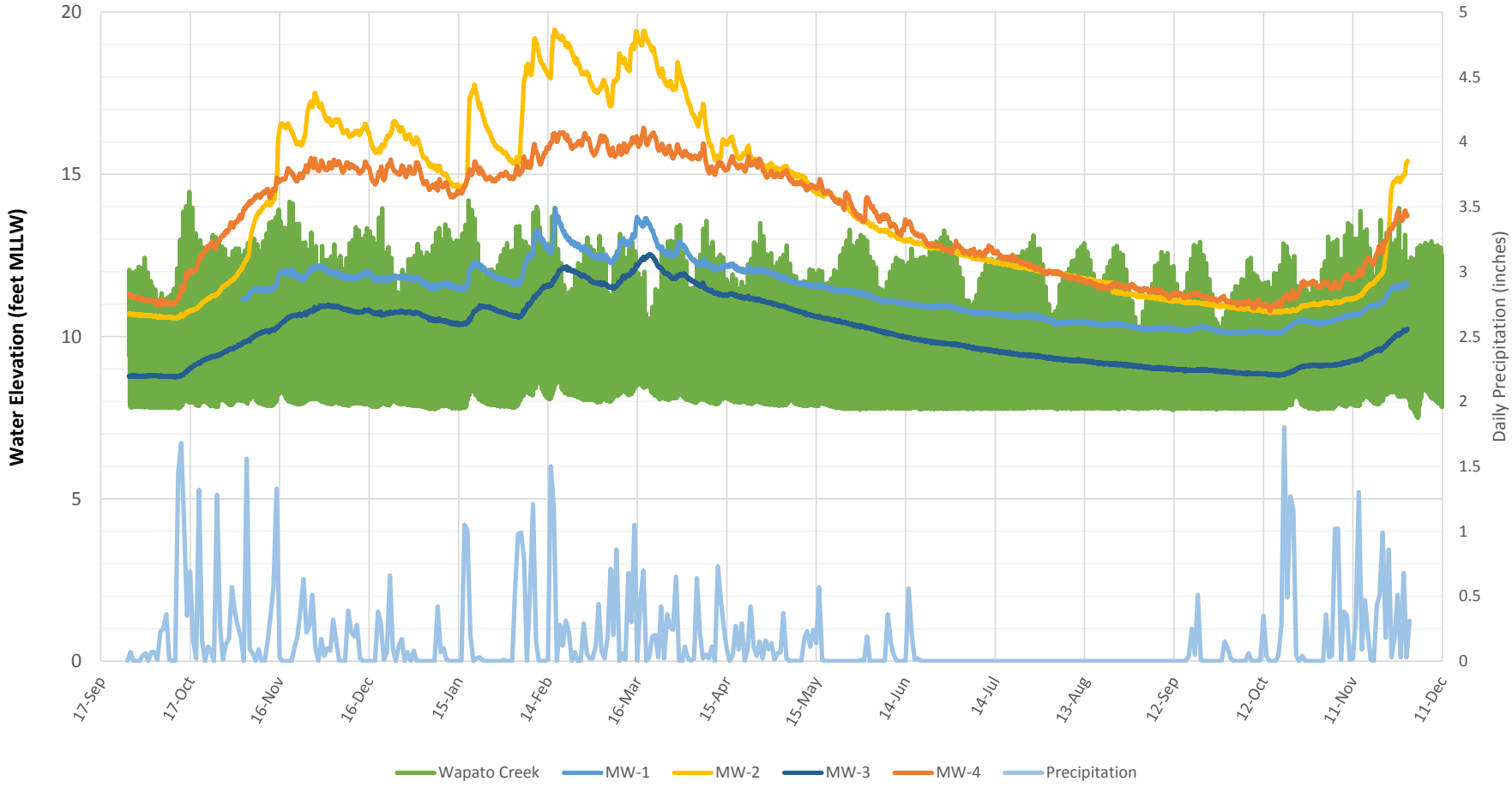

FIGURE 14. Monitoring Well Data Table

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

Port of Tacoma

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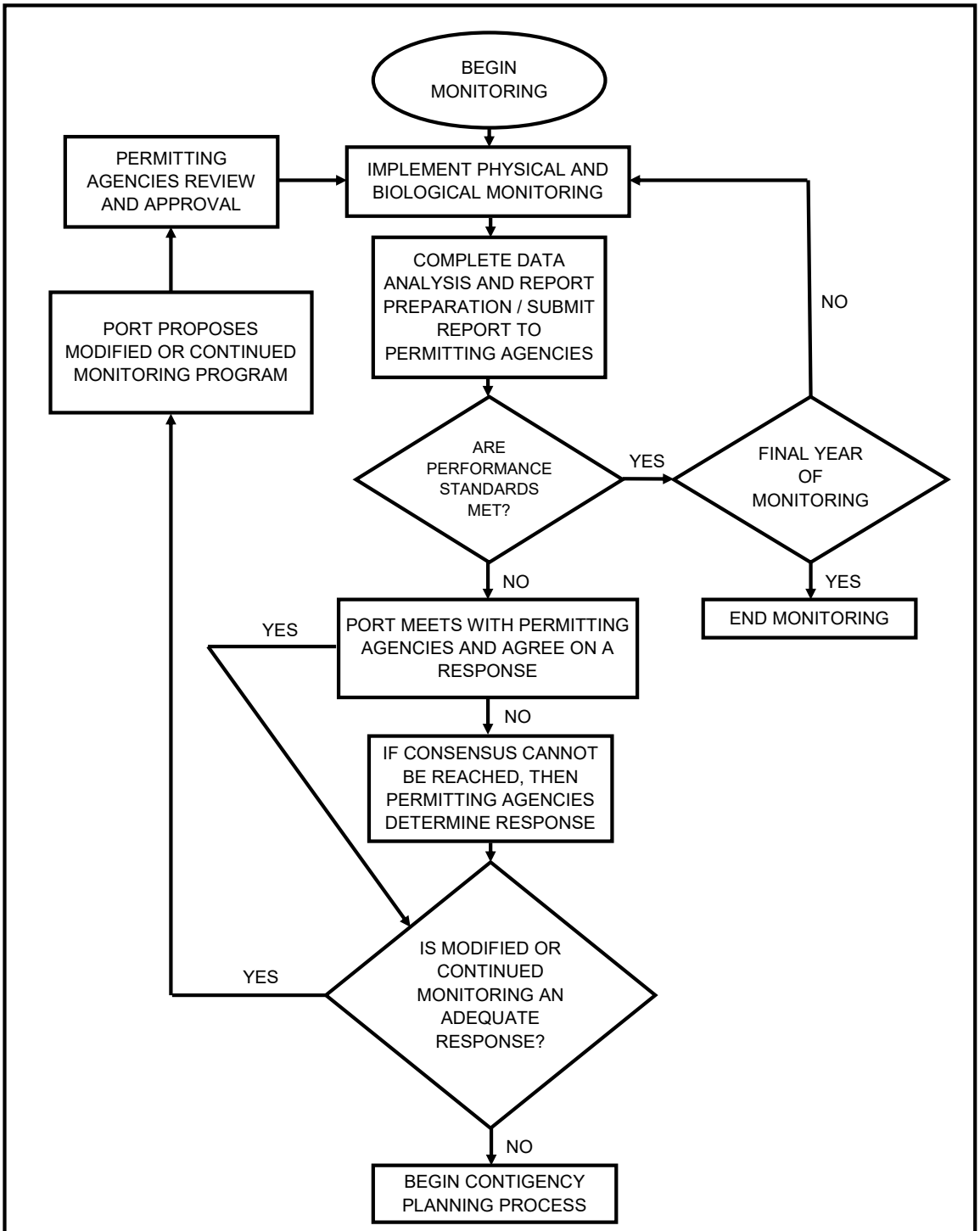


FIGURE 15. Problem Recognition Flow Chart

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

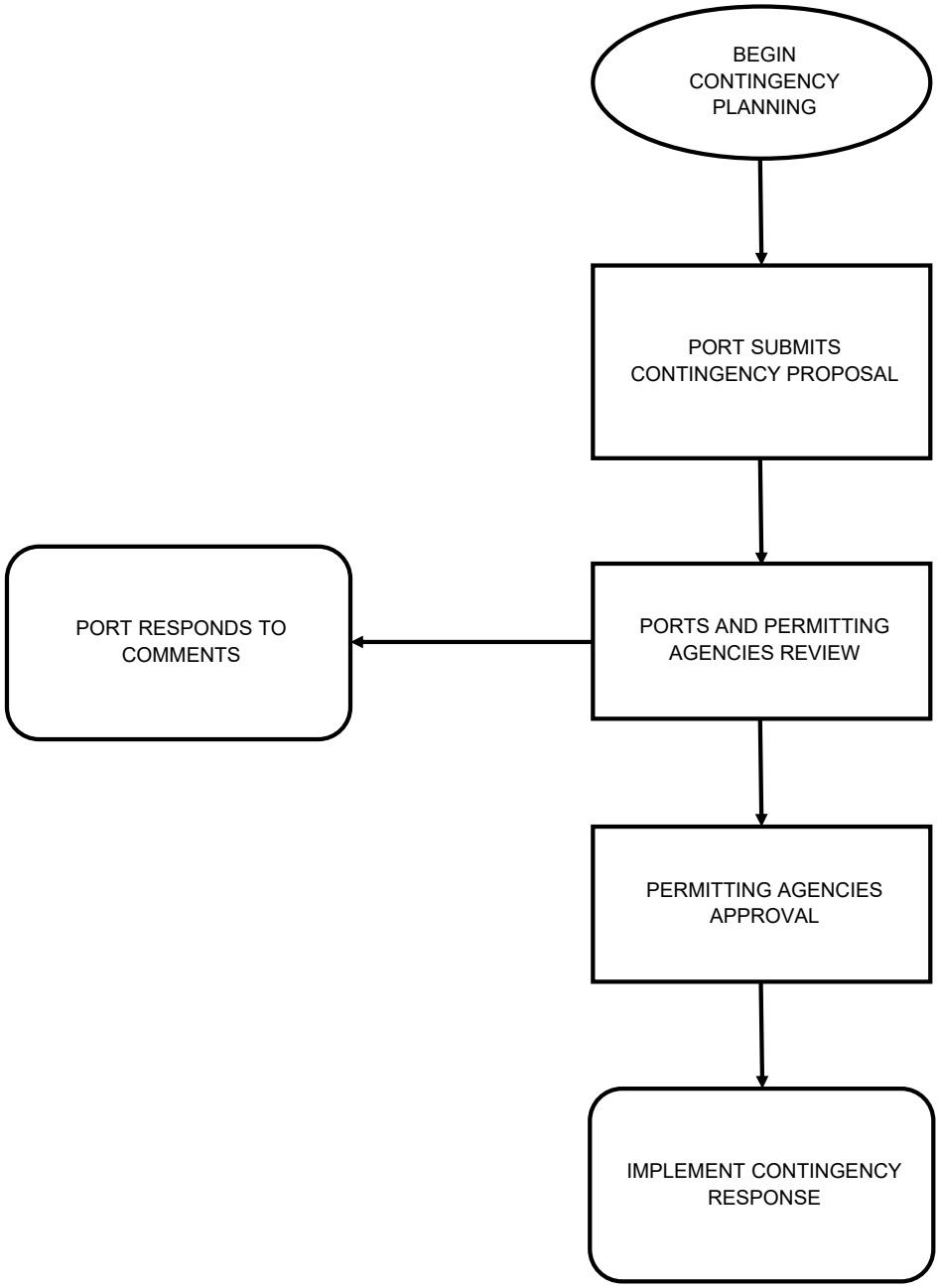


FIGURE 16. Contingency Planning and Response Flow Chart

Lower Wapato Creek Habitat Project

Port of Tacoma

DATE: 1/25/2021

APPENDIX B – HISTORICAL AERIAL PHOTOGRAPHS

APPENDIX B
HISTORICAL AERIAL PHOTOGRAPHS FROM GEOENGINEERS 2010

1931 aerial photo

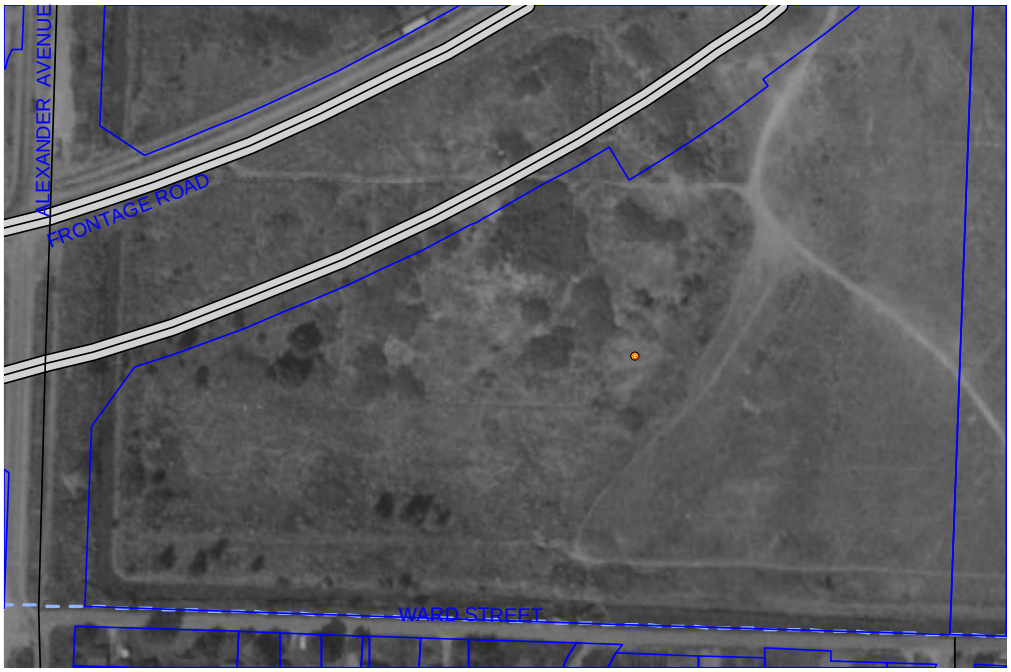
1940 aerial photo

1941 aerial photo

1950 aerial photo

1957 aerial photo

1968 aerial photo



1973 aerial photo

1990 aerial photo

1996 aerial photo

1998 aerial photo

2005 aerial photo

2006 aerial photo

2009 aerial photo

APPENDIX C – CURRENT AND PREVIOUS WETLAND JURISDICTIONAL DETERMINATIONS

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, SEATTLE DISTRICT
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

Regulatory Branch March 16, 2020

Mr. Mark Rettmann
Port of Tacoma
Post Office Box 1837
Tacoma, Washington 98401

Reference: NWS-2020-163-WRD
Tacoma, Port of (Lower Wapato Creek Habitat Project)

Dear Mr. Rettmann:

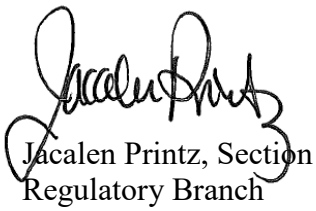
We reviewed the information you provided on January 7, 2020, regarding the jurisdiction of Wetlands A – H, located on Port of Tacoma property at 1131 East Alexander Avenue, at Tacoma, Washington, as shown on the enclosed drawing dated December 7, 2012.

We have determined that the eight closed depression areas, termed Wetlands A – H, are not waters of the U.S. As such, work that would occur within these areas does not require Department of the Army authorization under Section 404 of the Clean Water Act. Other state and local regulations may still apply to these wetlands. For example, the Washington State Department of Ecology (Ecology) may regulate these wetlands. For information on how to obtain State approval for your project, you should contact Ecology's Federal Permit Coordinator at ecyrefedpermits@ecy.wa.gov or at (360) 407-6068. Information regarding State permitting requirements can also be found at the following website: https://ecology.wa.gov/Water-Shorelines/Wetlands/Regulations. We are sending a copy of this letter to Ecology and to the Environmental Protection Agency's Aquatic Resources Unit.

This approved jurisdictional determination is valid for a period of five years from the date of this letter unless new information warrants revisions of the determination. A copy of this jurisdictional determination, dated February 27, 2020 can be found on our website at www.nws.usace.army.mil select "Regulatory Branch, Permit Information" and then "Jurisdictional Determinations". If you object to this determination, you may request an administrative appeal under our regulations (33 Code of Federal Regulations, Part 331) as described in the enclosed *Notification of Administrative Appeal Options and Process and Request for Appeal* form.

If you propose to do any work in the areas identified to be waters of the U.S., you should contact our office prior to commencing work to determine permit requirements. If you have any questions, please contact Mr. Jason Sweeney at jason.t.sweeney@usace.army.mil or at (206) 764-3450.

Sincerely,



Jacalen Printz, Section Chief
Regulatory Branch

Enclosures

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

REPLY TO
ATTENTION OF

Regulatory Branch

MAR 25 2009

RECEIVED
MAR 27 2009
ENVIRONMENTAL DEPT.

Port of Tacoma
Mr. Tony Warfield, Environmental Project Manager
Post Office Box 1837
Tacoma, Washington 98401-1837

Reference: NWS-2003-467-WRD
Port of Tacoma
Dredge Disposal Area
Parcel 14

Dear Mr. Warfield:

The U.S. Corps of Engineers (Corps) has reviewed the information provided by the Port of Tacoma, dated March 16, 2009, for Parcel 14, dredged disposal area, located along State Route 509, between 4th Street East and 12th Street East, in Tacoma, Pierce County, Washington. Based on information you provided and the letter dated December 22, 2003 (enclosed), we have determined that the dredged disposal area indicated on the enclosed drawing, dated March 23, 2009, are not waters of the United States. As such, work that would occur within the dredged disposal area does not require Department of the Army authorization under Section 404 of the Clean Water Act.

This approved jurisdictional determination is valid for a period of 5 years from the date of this letter unless new information warrants revisions of the determination. If you propose to do any work on Parcel 14 outside the dredged disposal area, as identified on the enclosed drawing, you should contact our office prior to commencing work to determine permit requirements. Please note that conducting certain activities in waters of the U.S. without Department of the Army authorization would violate Federal law. If you have any questions, please contact Olivia Romano at (206) 764-6960 or via email at olivia.h.romano@usace.army.mil.

Sincerely,

Kristina S. Tong

Kristina Tong, Senior Scientist
Regulatory Branch

Enclosures

From: Meyer, Zachary (ECY)
To: Rettmann, Mark
Cc: Lund, Perry (ECY); Kingsbury, Lori (ECY)
Subject: RE: Jurisdictional Determination - Lower Wapato Creek Habitat Project
Date: Wednesday, March 25, 2020 9:30:58 AM
Attachments: image001.png
image003.png

Hi Mark,

We have reviewed the submitted materials including the March 2020 Army Corp of Engineers Jurisdictional Determination (NWS-2020-163-WRD) for Port of Tacoma Parcel 14 at 1131 East Alexander Avenue, Tacoma WA.

The facts of this parcel have not changed, and this email can serve as an extension of the original Ecology jurisdictional determination from October 13, 2011. The wetlands (Wetlands A-H) on this parcel are not considered "waters of the state" and they can be legally disturbed, filled, or otherwise altered without further Ecology review. This Ecology determination is valid for 5 years from March 25, 2020.

If you need a more formal letter from Ecology, it will have to wait until we are back in the office as we are currently out of the office indefinitely due to the current Coronavirus health crisis.

Please let me know if you have any questions or if you need additional documentation from Ecology.

Zach Meyer
Wetlands/Shorelands Specialist
Shorelands & Environmental Assistance Program
Washington State Department of Ecology
Southwest Regional Office, Lacey, WA
360-407-6167

DEPARTMENT OF ECOLOGY State of Washington

From: Rettmann, Mark [mailto:MRettmann@portoftacoma.com]
Sent: Thursday, March 19, 2020 11:02 AM
To: Meyer, Zachary (ECY) <ZMEY461@ECY.WA.GOV>
Subject: RE: Jurisdictional Determination - Lower Wapato Creek Habitat Project

Thanks for the quick response and ETA.

Take care,
Mark

From: Meyer, Zachary (ECY) <ZMEY461@ECY.WA.GOV>
Sent: Wednesday, March 18, 2020 4:54 PM
To: Rettmann, Mark <MRettmann@portoftacoma.com>
Subject: RE: Jurisdictional Determination - Lower Wapato Creek Habitat Project

Hi Mark,

I will check it out and get back to you. Generally, we like to see these, but we are currently on a moratorium for site visits until the end of April due to the Coronavirus.

Since there was a previous determination, and facts seem to be the same, I may be able to make a call without seeing the site in this instance (I need to check with my supervisor). Hopefully I can get something to you next week, or at least a better idea of how we will proceed. We are all working remotely indefinitely, so it is a bit different coordinating with my colleagues.

Zach Meyer
Wetlands/Shorelands Specialist
Shorelands & Environmental Assistance Program
Washington State Department of Ecology
Southwest Regional Office, Lacey, WA
360-407-6167

DEPARTMENT OF ECOLOGY State of Washington

From: Rettmann, Mark [mailto:MRettmann@portoftacoma.com]
Sent: Wednesday, March 18, 2020 4:19 PM
To: Meyer, Zachary (ECY) <ZMEY461@ECY.WA.GOV>
Subject: Jurisdictional Determination - Lower Wapato Creek Habitat Project

Hello Zach,

The Port is planning the Parcel 14 – Lower Wapato Creek Habitat Project (LWCHP) and just received a renewed JD (attached: NWS-2020-163-WRD) from the Corps. The other attached document is the jurisdiction evaluation of the property that was conducted for the previous permitting effort. This document includes the previous determinations by the Corps, City of Tacoma, and Ecology.

We received a HPA and City critical areas permit for this habitat project in 2013 but have been waiting for the Corps permit and the resolution of cultural concerns. Those permits are now expired and we are planning on re-applying in mid-April since we've now received Tribal support.

Previously, the Corps, City of Tacoma, and Ecology all determined that the wetland features were non-jurisdictional. Since then, the site has not changed and the Port has been maintaining the area as a dredge disposal area until the habitat project is constructed.

The previous Ecology determination letter dated October 13, 2011 from Alex Callender (included in the attached evaluation) stated the following:

- "In consideration of the facts, Washington Department of Ecology will not exert jurisdiction over these areas, and will not consider them as project impacts. Ecology will not require further identification, protection, segregation or special management of these areas during your continuing site development. This jurisdictional determination is valid for five years."

Considering the current social distancing government guidelines, the site can be seen from google maps at the following link: (https://www.google.com/maps/place/47%C2%B014'50.2%22N+122%C2%B022'09.9%22W/@47.247284,-122.3716087,454m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d47.247284!4d-122.36942)

I can also provide a tour of the site if you would like to see it in person (we'll just stand >6 ft apart) or you're welcome to stop by and park near the Prologis Warehouse's (46th Ave E).

Can you please review this determination and let me know if it is still valid or can be extended, renewed, or reissued?

Let me know if you have any questions or need anything else. I'd also like to know an estimated turn around time to pencil into my project schedule.

Thanks in advance,
Mark

All e-mail communications with the Port of Tacoma are subject to disclosure under the Public Records Act and should be presumed to be public.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 13, 2011

Robert Brenner, Environmental Program Manager
Port of Tacoma
P.O. Box 1837
Tacoma, WA 98401-1837

Re: Parcel 14

Dear Robert:

Thank you for the quick response. This letter is in regard to fill and grade activities at Parcel 14 found at 4801 E. 12th Street, Parcel # 0320014103, in Pierce County. The Department notes that the Dredge Disposal Area in the Seattle District Corps of Engineers December 22, 2003 jurisdictional determination letter, is an active dredge disposal /dewatering site. The depressions meet the parameters for wetlands, but they are the result of improper grading of dredge spoils. We do not consider these areas "waters of the state" and they can be legally disturbed, filled, or otherwise altered without further review or 401 permit authorization for wetland impacts.

In consideration of the facts, Washington Department of Ecology will not exert jurisdiction over these areas, and will not consider them as project impacts. Ecology will not require further identification, protection, segregation or special management of these areas during your continuing site development. This jurisdictional determination is valid for five years.

Please contact me if you have further questions.

Sincerely,

Alex Callender
Wetland/Shoreland Specialist for Lewis, Thurston, and Pierce Counties
Shorelands and Environmental Assistance Program
WA Department of Ecology
acal461@ecy.wa.gov
360-407-6167

cc: Helen Pressley, Dept of Ecology

City of Tacoma
Office of the Land Use Administrator
Report And Decision

WETLAND/STREAM/FWHCA ASSESSMENT PERMIT

FILE NO. : WET2009-40000129270

Applicant:
Port of Tacoma
P.O Box 1837
Tacoma, WA 98401

SUMMARY OF REQUEST

Proposal:
A Wetland/Stream/FWHCA Assessment Permit to verify whether any regulated wetlands, streams or Fish and Wildlife Habitat Conservation Areas (FWHCA) exist on the subject site or within 300 feet.

Location:
Primary Address 4801 E 12th Street, Primary Parcel No. 0320014103.

Decision: The on-site wetlands and ditches, as well as the abutting 12th Street Ditch and Fife Ditch, are not subject to the provisions of *TMC* 13.11. The approved Wetland/Stream/FWHCA Assessment Permit is subject to usual conditions.

Note:
Appeal period on this decision closes October 9, 2009.

The effective date of this decision is October 12, 2009, provided no requests for reconsideration or appeals are timely filed as identified in APPEAL PROCEDURES of this report and decision.

FOR ADDITIONAL INFORMATION CONCERNING THIS LAND USE PERMIT PLEASE CONTACT:

Shannon Stragier, 253-594-7852
Senior Environmental Specialist
Public Works Department, Building and Land Use Services
747 Market Street, Room 345
Tacoma, WA 98402
Email: sstragier@cityoftacoma.org

SUMMARY OF RECORD

The following attachments and exhibits constitute the administrative record:

Attachments:

A. Site map of Dredge Disposal Area dated March 23, 2009.
B. Letter form the Port of Tacoma dated April 20, 2009
C. Memorandum dated September 7, 2009 from Shannon Stragier, City of Tacoma Senior Environmental Specialist.
D. Wetland map prepared by The Watershed Company dated February 23, 2009.
E. Timeline of Port activities on Parcel 14.
F. Photos of the Wapato Creek berm and Fife Ditch pump station.
G. Jurisdictional Determination from the U.S. Army Corp of Engineers dated December 22, 2003 and March 25, 2009.

Exhibits[1]:

A. Applicable Regulations and Policies.
B. Agency Comments
C. Public Comments.
D. Applicant's response to comments dated August 14, 2009.

The Acting Land Use Administrator enters the following Findings of Fact and Conclusions of Law based upon the applicable criteria and standards set forth in the *TMC*, the policies of the *Comprehensive Plan*, and the Attachments and Exhibits listed above.

FINDINGS OF FACT

Proposal:

1. The applicant specifically asks the City to conduct an evaluation of the jurisdictional status of Parcel 14 in regards to wetlands. This review is done under a Wetland/Stream/FWHCA Assessment Permit. The review will also verify whether any additional regulated wetlands, streams or Fish and Wildlife Habitat Conservation Areas (FWHCA) exist on the subject site or within 300 feet.
2. No development is associated with the permit and no change of use of the land is proposed.
3. The applicant asserts that the wetlands located on the site are artificial wetlands and non-jurisdictional based on the sites development history, on-going use, and maintenance activities.
4. The applicant also asserts that the 12th Street Ditch and Fife Ditch located adjacent to the south and eastern project site boundaries are drainage district ditches that were constructed and are maintained for stormwater conveyance.

[1] All Exhibits are contained in Public Works Department File No. 40000129270. They referenced and incorporated herein as though fully set forth.

5. The applicant states that the site has been in continuous use and maintained as a dredge and clean-fill disposal area since the mid-1960s and the original filling of the site created a non-wetland area.
6. The majority of the fill is hydraulically placed marine sediments which are inherently uneven and experience differential settlement resulting in depressions. Ditches were cut on the site per U.S. Army Corps of Engineers guidelines for dewatering dredge spoils to facilitate drainage of the depressions. Despite this maintenance the settlement rate has continued.
7. The applicant asserts that the resultant wetlands located in the depressions were intentionally created. The differential settlement and creation of depressions is an expected and common outcome when managing hydraulically placed marine sediments deposited as dredge spoils.

Project Site

8. Primary Address 4801 E 12th Street, Primary Parcel No. 0320014103.
9. The subject site is commonly referred to as Parcel 14 which comprises parcels 0320011013, 0320011010, 0320011032, 0320011089, 0320011041, 0320014102, 0320014016, and 0320014103.
10. The subject site is undeveloped and dominated by grasses and shrubs. There are several dirt access roads on the site and a large mound of fill material. Nine wetlands were identified. There are also several ditches located on the site.

Surrounding Area

11. The area surrounding the property is comprised of industrial/commercial uses except for a residential area that is located to the south. Both the east and southern sides are bordered by the City of Fife.
12. Wapato Creek is located off-site and to the west. The southern and eastern side of the subject site is bordered by ditches that are described as agricultural drainage district ditches.

Additional Information

13. The permit was determined to be complete on May 19, 2009.
14. Shannon Stragier, City of Tacoma Senior Environmental Specialist (SES) visited the site on July 30, 2009, August 25, 2009, August 27, 2009, September 1, 2009, and September 9, 2009. All accessible areas within 300 of the site were investigated for the presence of wetlands, streams, and FWHCAS.
15. The SES conducted an extensive review including the history of the site, information on the management of dredge disposal sites, historical photos, and prior decisions made regarding artificial wetlands.
16. The SES has presented her analysis in a technical memorandum dated September 7, 2009. See Attachment "C". The Administrator would note that the SES is the City's expert on wetland, stream and other critical areas issues and her recommendations on the proposal should be afforded substantial weight in this matter.

17. Historical photos show that the site was completely filled sometime in the 1960s.
18. During site visits the SES found evidence that vegetation had been cut back, fill had been placed on the site, access roads had been constructed and ditches used to drain the site were still present. The sediment on the site consists of fine sands and silts which are common for undeveloped dredge disposal sites in the Port of Tacoma.
19. The SES inspected the wetland areas identified by The Watershed Company and confirmed that they have the three indicators of wetlands; hydrophytic vegetation, hydric soils and evidence of hydrology. Soils consisted of fine sands and silts with redoximorphic features and there was evidence of ponding. No other wetlands were identified within 300 feet of the subject site. The SES also notes that the depressions are shallow and do not intercept the native soils.
20. The SES, after reviewing information from Hart Crowser and Associates Inc. on the geology of the Port of Tacoma and the U.S. Corps of Engineers for the management of dredge disposal sites, confirmed the Port of Tacoma's assertion that differential settlement will occur and is an expected outcome. In addition the SES found that hydraulically placed marine sediments consist of a mixture of dredged material and water. During the initial dewatering or passive phase as the material undergoes self-weight consolidation water will be brought to the surface. Dewatering is greatly influenced by climate and is a relatively slow process and once ponded water is decanted precipitation can continue to create ponded areas.
21. The SES finds that the combination of poorly draining marine sediments, water, differential settlement and subsequent depressions would allow the establishment of wetlands. Depressional areas with fine sediments will collect and pond water. Given the slow process of dewatering and continued maintenance problem of managing ponded water from precipitation, the site would allow the establishment of hydrophytic plants.
22. The SES also discusses establishing whether an individual intentionally created an artificial wetland as defined in *TMC* 13.11.900.W. The *TMC* states in part that "Wetlands do not include those artificial wetlands intentionally created from non-wetland site, including but not limited to irrigation and drainage ditches, grass-lined swales, canals, detention facilities, farm ponds, and landscape amenities if routinely maintained for those purposes". The SES asserts that the initial filling of the site created a non-wetland area. The placement of fine marine sediments, water and process of differential settlement were intentional and not accidental and resulted in the formation of wetlands. Therefore, the SES has concluded that the wetlands were intentionally created from a non-wetland area. In a letter dated December 22, 2003, the Army Corps of Engineers made a similar finding and reaffirmed their stance in a letter dated March 25, 2009. Both the SES and the Army Corps of Engineers note that the Port of Tacoma continues to maintain the site for the purpose of depositing dredge spoils. See Attachment "G".
23. After reviewing the Marshall Avenue decision (File No. 94.02) and historical photos, the SES finds that the use and maintenance activities on the Parcel 14 site are similar with those that occurred on the Marshall Avenue site. The SES also notes that the information available to establish the history and use of the Parcel 14 is consistent with the evidence provided for the Marshall Avenue decision.
24. The SES inspected the ditches located on the site. The Port of Tacoma states that the drainage ditches located on-site were constructed to drain the hydraulic fill. After

conducting site visits and reviewing historical aerial photos from govME, the SES concurs that the drainage ditches located on the subject site were dug from fill material and constructed for the purpose of dewatering the site.

25. The SES also inspected the district drainage ditches located along the southern (12th Street ditch) and eastern edge of the site (The Fife Ditch). The Port of Tacoma states that the ditches are excavated drainage channels that are maintained for the purpose of conveying stormwater. The applicant states that the 12th Street ditch is separated from Wapato Creek by an earthen berm and water in the ditch flows to the east and enters the Fife Ditch. Flows from the Fife Ditch pass through a pump station and tide gates, which serve as a fish barrier, before entering Hylebos Creek.
26. After researching information about the ditches and conducting site visits, the SES concurs that the earthen berm separates the 12th Street ditch from Wapato Creek and serves as a fish passage barrier and that the pump station and tide gates serve as a fish passage barrier between the Fife Ditch and Hylebos Creek. The SES also confirmed that the ditches are drainage district ditches maintained to convey stormwater and do not convey natural waters. Therefore, it is recommended that they are exempt from the provisions of *TMC* 13.11.
27. It was confirmed that Wapato Creek is located more than 300 feet from the site on the adjacent parcel (0320013145) to the west. Wapato Creek is a stream of local significance and receives a code required buffer of 150 feet. The 150 foot buffer does not extend on to the subject site. No other streams were identified on or within 300 feet of the subject site.
28. No Fish and Wildlife Habitat Conservation Areas were identified on or in the surrounding area.
29. Pursuant to the State's SEPA Rules (WAC 197-11) the Port of Tacoma, as acting lead agency, has determined that this project is exempt from the threshold determination requirements of SEPA.

Notification and Comments

30. The proposal was transmitted on June 17, 2009 to several reviewing agencies for review and comment
31. In a memorandum dated July 9, 2009 Richard A. Meuschke of Environmental Services provided comments addressing any future development of the site.
32. In an email dated July 2, 2009 The Puyallup Tribe provided comments. Concern was expressed with the use of the site for the placement of dredge disposal.
33. In an email dated June 23, 2009 the Washington Department of Fish and Wildlife commented that the creek bordering the east side of the property is a documented fish stream and tributary to Hylebos Creek. Further, the department has documented fall chum and winter steelhead in this creek.
34. Written notice of this land use application was sent to all owners of property within 400 feet of the site, the neighborhood council, and qualified neighborhood groups on June 19, 2009 allowing 14 days to comment.
35. One comment letter dated July 3, 2009 was received from the Puget Creek Restoration Society with recommendations for any future development.

36. The Port of Tacoma provided a letter dated August 14, 2009 in response to the agency and public comments. In general the response seeks to clarify that a permit is not being acquired to establish a dredge disposal facility as this is an existing use. The permit is to seek clarification of the regulatory status of certain portions of Parcel 14. The Port of Tacoma does concur that there are many appropriate Low Impact Development techniques and it is their policy to explore the use of LID techniques where feasible and any future development would comply with applicable requirements for surface water management and sewer.

37. The Land Use Administrator would note that the permit under review is not proposing any new use or development on the subject site and is being issued to establish the regulatory status of critical areas. As such, the Land Use Administrator cannot through this process restrict or condition the historical and continued use of the subject site. Any new use or development will be reviewed under separate application and the Land Use Administrator under that application may deny, restrict or condition the proposal.

38. The Land Use Administrator would also note that the use of the site for placement of fill material may require building permits from the City of Tacoma for grade and fill activities and review for surface water management.

Conclusion of Law as Finding of Fact

39. Any conclusion of law hereinafter stated which may be deemed a finding of fact herein is hereby adopted as such.

CONCLUSIONS OF LAW

Jurisdiction:

1. The Land Use Administrator has jurisdiction in this matter. See *TMC* 13.05.030.

Burden of Proof:

2. The applicant bears the burden of proof to demonstrate the proposal is consistent with the provisions of the *TMC*, the applicable provisions of the City's *Comprehensive Plan*, and other applicable City ordinances.

Applicable Regulations:

3. Wetlands. Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include small lakes, ponds, swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including but not limited to irrigation and drainage ditches, grass-lined swales, canals, detention facilities, farm ponds, and landscape amenities if routinely maintained for those purposes. Wetlands do not include those wetlands created after July 1, 1990, which were unintentionally created as a result of the construction of a road, street, or highway. However, wetlands do include those artificial wetlands intentionally created to mitigate conversion of wetlands. See *TMC* 13.11.900.W

4. An assessment may be issued verifying whether a regulated wetland, stream or FWHCA exists on the subject site or within 300 feet of the subject site. This distance may be expanded if the type of critical habitat or species involved requires more than a 300 foot management area pursuant to WDFW management recommendations. See *TMC* 13.11.123.A.3

Conclusions:

5. Any Finding of Fact later deemed to be a Conclusion of Law is hereby adopted as such.
6. The entire site was legally filled with dredge spoils in the mid 1960's resulting in the filling of any tidal marsh or wetland areas that once existed and created a non-wetland site. Findings 3, 5, 7, 17-18, 22
7. The site has historically and is currently used as a dredge spoils and fill disposal site. Findings 3, 5-7, 17-18, 22
8. Nine different locations on the subject site were deemed to meet the three criteria for a wetland determination. Findings 10, 19
9. The intentional placement of legal hydraulically placed marine sediments and fill on the site has created wetlands in an area of fill or non-wetland. The site has continued to be maintained as a dredge and fill spoil disposal area. Therefore, the wetlands are artificial wetlands and are not subject to the provisions of *TMC* 13.11. Findings 3, 5-7, 10, 19-23
10. The ditches located on the subject site were constructed to facilitate drainage of the fill and are not subject to the provisions of *TMC* 13.11. Findings 6, 10, 18, 24
11. The 12th Street ditch and Fife Ditch are district drainage ditches which have been maintained for the purpose of conveying stormwater and they do not convey natural waters. Though the Washington Department of Fish and Wildlife has documented the Fife Ditch as a fish stream and tributary to the Hylebos Creek, information provided by the Port of Tacoma and verified by the City's SES demonstrates that the flows from the Fife Ditch pass through a pump station and tide gates, which serve as a fish barrier, before entering Hylebos Creek. Therefore, the Fife Ditch and the 12th Street Ditch are not subject to the provisions of *TMC* 13.11. Findings 4, 25-26, 33

DECISION

Based upon the findings and conclusions set forth above, it is the Land Use Administrator's decision that the on-site wetlands and ditches and the abutting 12th Street Ditch and Fife Ditch are not subject to the provisions of *TMC* 13.11. The approved Wetland/Stream/FWHCA Assessment Permit is subject to the following usual conditions:

Usual Conditions:

1. The decision set forth herein is based upon representations made and information submitted, including development plans and proposals, submitted to the Land Use Administrator. Any substantial change(s) or deviation(s) in such development plans, proposals, or conditions of approval imposed shall be subject to the

approval of the Land Use Administrator, and may require additional permitting, public notification and comment.

2. The authorization(s) granted herein is/are subject to all applicable federal, state and local laws, regulations, and ordinances. Compliance with such laws, regulations, and ordinances are conditions precedent to the approvals granted and are continuing requirements of such approvals. By accepting this/these approvals, the applicant represents that the development and activity allowed will comply with such laws, regulations and ordinances. If, during the term of the approvals granted, the developments and activities permitted do not comply with such laws, regulations or ordinances, the applicant agrees to promptly bring such developments or activities into compliance.
3. The Wetland Assessment Permit shall become void after a period of five (5) years has expired from the date of this decision or appeal decision.

ORDERED this 25th day of September, 2009.

Jana Magoon
Acting Land Use Administrator

FULL DECISION TRANSMITTED this 25th day of September, 2009 by first class mail to the following:

✓Tony Warfield, Port of Tacoma, PO Box 1837, Tacoma, WA 98401-1837
Puget Creek Restoration Society, Scott Hansen, 702 Broadway Suite 101, Tacoma, WA 98402
Brandon Reynon, Puyallup Tribe of Indians, 3009 East Portland Avenue, Tacoma, WA 98404
Pierce County Assessor-Treasurer, 2401 South 35th Street, Room 142, Tacoma, WA 98409, Attn: Darci Brandvold

SUMMARY OF DECISION TRANSMITTED this 25th day of September, 2009 by first class and interoffice mail to the following:

All property owners with 400 feet of the subject site
New Tacoma Neighborhood Council and Chairperson
Neighborhood Planning Team Members: Peter Huffman, Donna Stenger and Elton Gatewood
Tahoma Audubon Society, 2917 Morrison Road West, University Place, WA 98466-4619
Leslie Ann Rose, Citizens for a Healthy Bay, 1917 Pacific Avenue, Suite 406, Tacoma, WA 98402

PLEASE BE ADVISED THAT YOUR PROPOSAL MUST CONFORM WITH BUILDING CODE REQUIREMENTS, AND A BUILDING PERMIT MUST BE OBTAINED PRIOR TO ANY CONSTRUCTION. CONTACT THE BUILDING AND LAND USE SERVICES DIVISION OF THE DEPARTMENT OF PUBLIC WORKS AND THE FIRE

PROTECTION ENGINEER REGARDING THESE MATTERS, THIRD FLOOR, TACOMA MUNICIPAL BUILDING, TELEPHONE 591-5363.

PURSUANT TO RCW 36.70B.130, YOU ARE HEREBY NOTIFIED THAT AFFECTED PROPERTY OWNER(S) RECEIVING THIS NOTICE OF DECISION MAY REQUEST A CHANGE IN VALUATION FOR PROPERTY TAX PURPOSES CONSISTENT WITH PIERCE COUNTY'S PROCEDURE FOR ADMINISTRATIVE APPEAL. TO REQUEST A CHANGE IN VALUE FOR PROPERTY TAX PURPOSES YOU MUST FILE WITH THE PIERCE COUNTY BOARD OF EQUALIZATION ON OR BEFORE JULY 1ST OF THE ASSESSMENT YEAR OR WITHIN 30 DAYS OF THE DATE OF NOTICE OF VALUE FROM THE ASSESSOR-TREASURER'S OFFICE. TO CONTACT THE BOARD CALL 253-798-7415 OR <WWW.CO.PIERCE.WA.US/BOE>.

APPENDIX D – PORT OF TACOMA HABITAT/MITIGATION SITE STEWARDSHIP PROCEDURE

Habitat/Mitigation Site Stewardship

Procedure Number: 4820.0

Associated Policy: EN01

1. DEFINITIONS

Term	Definition
Stewardship	The care of habitat and mitigation sites by removing invasive species and trash so that the intended habitat functions and value of the sites are maintained. This is normally accomplished exclusively with hand tools. Stewardship does not include routine maintenance of infrastructure, such as viewing platforms, parking lots, signs, and tide gates.
Habitat/Mitigation Sites	Sites that are formally set aside by the Port to replace ecologic functions impacted by Port development and remediation projects or are used as natural buffers between the Port and area neighborhoods. These sites specifically do not include undeveloped land with habitat functions.
ROW	Right of Way, the strips along road, rail or utility corridors.

2. PURPOSE

Background

The Port's Stewardship Program provides for the maintenance of Port-owned and Port-maintained habitat sites that have been created for mitigation or conservation purposes. This Environmental Procedure establishes a process for those stewardship activities conducted on these sites.

Associated Process

4822 Long-Term Monitoring, Operation and Maintenance and Institutional Controls.

3. SCOPE

Audience

Environmental, Engineering, Maintenance and Real Estate.

Activities	Primarily post construction warranty period stewardship work on habitat sites.

4. PREREQUISITES/RESOURCES/FORMS/LINKS

Required Documents, Worksheets, Reports, Etc.

Planning Department:

- Port Critical Areas Map in the Port GIS System.

Environmental Department:

- Inventory and written stewardship requirements for Port mitigation/habitat sites.
- Training records.
- Records of stewardship activities conducted by conservation groups.

5. RESPONSIBILITIES

Responsible Party & Contact Information

It is the responsibility of the Environmental Project Manager in charge of site stewardship, generally the Port Biologist, to manage both the Stewardship Program and advocate for the sites through the Planning and Design processes.

6. PROCEDURE

Step by Step Actions

Planning

Port IT Department maintains a GIS system that shows the Port's habitat/mitigation sites. As new sites are developed or stewardship responsibilities change, the assigned manager for the stewardship program is responsible for providing updates to the GIS Manager.

Maintenance of Port habitat infrastructure is the responsibility of an assigned Environmental Project Manager. The assigned Environmental Project Manager keeps track of the conditions on Port habitat sites that are critical to proper functioning of the site, and arranges for the appropriate stewardship activities

when needed. By policy, most maintenance activities are conducted by Port Maintenance crews, unless Port Labor has exercised its first right of refusal. Therefore, one of the responsibilities of the stewardship Environmental Project Manager is to coordinate with Maintenance at the planning stage (at least two weeks prior to work) of stewardship activities to determine who will complete the activities (see **Maintenance** section below for further discussion). It is at this point an agreement is reached as to which activities constitute stewardship and which constitute maintenance.

The Port's Stewardship Program provides an excellent opportunity to engage the community in the care of habitat sites. The Port has used conservation groups such as Citizens for a Healthy Bay and Forterra in the past to provide technical expertise on the needs of habitat/mitigation sites and to coordinate with various community groups to conduct stewardship activities. Coordination of stewardship activities with conservation groups is the responsibility of the Environmental Project Manager with support from External Affairs.

Port Environmental and External Affairs jointly determine the Port's appropriate level of support in the local jurisdictions' open space programs.

Design

The Environmental Project Manager assigned to design teams will ensure conceptual plans do not impact existing habitat or mitigation sites.

During project design, the stewardship Environmental Project Manager will work with the mitigation site design teams to verify that planned mitigation sites can be maintained over time in a safe and efficient manner, including:

- that access is not limited during construction or after the project is completed to the point that maintenance and stewardship activities are impacted,
- whether it will be necessary for crews to conduct stewardship activities with hand tools,
- that safety such as highway and rail right-of-way (ROW) will not hamper stewardship activities, and surrounding property ownership.

The stewardship Environmental Project Manager will also work with the Director of Environmental and Planning Services on decisions regarding the appropriate level and nature (e.g., needed infrastructure) of public access, the annual O&M needs, and the likely constitution of stewardship crews. Decisions regarding the nature of public access will be communicated to the Engineering Project Manager as early in the Design process as possible.

Construction

The Environmental Project Manager shall work with an assigned Engineering Project Manager to ensure stewardship crews have access to mitigation sites through active construction sites. The stewardship crews should not work within active construction sites unless approved by the Port Engineering Project Manager and all applicable safety precautions have been taken, including use of personal protection equipment, as applicable.

Operations

The stewardship Environmental Project Manager shall work with the Contracts Department to retain any necessary organizations to provide stewardship services. This should be done in the first quarter of each year so service can commence early in the second quarter of each year. The following shall be incorporated in the Scope of Work as appropriate for each site:

- Visual inspection of each site noting invasive species, health of native plants, site security/access control and signs of illegal activities;
- Narrative of the site with photos as necessary to document the work completed over the season;
- Minor replanting as necessary;
- Trash removal.

Invasive vegetation control should focus on the most aggressive and damaging species common to Commencement Bay including:

- Japanese Knotweed (zero tolerance on Port mitigation sites);
- Scotch Broom;
- Himalayan Blackberry;
- Reed Canarygrass; and others as directed.

Other species are controlled as necessary and resources allow. A full list of Pierce County noxious weeds can be found at

http://piercecountyweedboard.org/index.php/noxious-weeds/noxious-weeds-2.

At least 48 hours prior to the start of any work activities at a mitigation site, the stewardship Environmental Project Manager shall decide, either personally or with help from Operations, to ensure any access through terminals is coordinated with the terminal operations, the stewardship crews and crew leaders receive all necessary training, and the applicable Homeland Security requirements are met (e.g., TWIC escort ratios, etc.).

The Environmental Project Manager should verify that stewardship crews have received appropriate safety awareness training when working inside a highway or rail ROW, and that the appropriate landowners are notified of the work. The Environmental Project Manager shall work with the Lead Construction Inspector to verify that inspection time is available to monitor

stewardship crews, particularly when working in a rail ROW. The Environmental Project Manager shall ensure that all necessary permits are received prior to any work within a critical area or its buffer per ENV SOP 400.

Maintenance

The Stewardship Program does not replace the Port's normal maintenance functions. The work conducted by Stewardship crews consists of hand removal of vegetation and trash from the Port's mitigation/habitat sites. The maintenance of structures at these sites (such as viewing platforms, parking lots, signs, and tide gates) is a normal maintenance function. The stewardship Environmental Project Manager shall work with the Director of Maintenance to schedule such work.

7. REFERENCES

Policies, RCWs & Standards

EN 4809.0 Wetland and Aquatic Area Protection

ENV SOP 400 Environmental Permitting – Permits and Reviews

Port of Tacoma Mitigation Site Map

8. CONTACTS

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9. HISTORY

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3/6/2018

Jason Jordan
Director of Environmental and Planning Services

Date