



## TECHNICAL MEMORANDUM

To: Nicole Floyd  
City of Olympia: Community Planning & Development  
P.O. Box 1967  
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Date: November 22, 2024

From: Farallon Consulting, L.L.C. dba Grette Associates  
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Re: West Bay Yards: No Net Loss and Mitigation Sequencing Narrative

### 1 INTRODUCTION

West Bay Development LLC (the developer) is proposing the construction of a 478-unit development with five buildings placed a street level plaza with surface and structured parking below totaling 823 Parking stalls, 401 long term and 62 short term bike parking spaces. Additionally, the developer is proposing to conduct a voluntary shoreline restoration action on the site waterward of the existing ordinary high water mark (OHWM) on the site (+15.5 feet mean lower low water [MLLW]). The subject property (Thurston County parcel #s 72600200101, 72600200102, 72600200103, 72600200104, 72600200105) is located at 1210 West Bay Drive in Olympia, WA. As development is proposed within 200 feet of the ordinary high water mark of Budd Inlet, the project is regulated under the Shoreline Master Program (SMP) pursuant to Title 18.20 of the Olympia Municipal Code (OMC).

This document is intended to demonstrate how the proposed project elements were designed to meet the requirements for mitigation sequencing as well as the requirements for no net loss of shoreline ecological functions or processes (OMC 18.20.410).

Per OMC 18.20.410, "All shoreline uses and development, including preferred uses and uses that are exempt from shoreline permit requirements, shall be located, designed, constructed, and maintained in a manner that maintains shoreline ecological functions and processes." The following sections provide an analysis of the existing shoreline ecological functions and processes present on the site and compare those functions against the proposed conditions present after project development.

Photographs showing the existing site conditions can be found in Attachment A. Additional site conditions, project details, and design alternatives are described in the 2024 *West Bay Yards Shoreline Restoration Design – Alternatives Analysis* prepared by Moffatt & Nichol, Grette Associates, J. A. Brennan, and Landau Associates Inc.

## 2 EXISTING SITE CONDITIONS

### 2.1 Upland Habitat

The subject property was first developed in in the early 1900's and was used as a sawmill. Various other industrial uses occurred on the site over the years until 1980, when the subject property was occupied by the Hardel Mutual Plywood Corp. plywood manufacturing facility. The facility stopped operations in 1996 and the buildings were demolished in the late 1990's. The site then underwent various remediation actions until 2010, when much of the site was backfilled with crushed concrete surfacing. Since that time the site has been vacant. The site is set below the grade of West Bay Drive and is primarily flat. A long, linear depression associated with two rail spur lines runs along the length of the west parcel boundary, parallel to West Bay Drive. Within and along this depression shrub and herbaceous vegetation has established, including willows, Himalayan blackberry, and butterfly bush. The central portions of the site are primarily unvegetated, with much of this area consisting of asphalt and crushed concrete. Shrubby vegetation that is present consists of occasional birch saplings, blackberry, butterfly bush, yellow sweet clover, and low grasses and forbs. Shell hash is also prevalent, likely the result of sea gulls and crows dropping shellfish from height during foraging. The upland riparian habitat along the top of the shoreline slope consists of small, sparse trees and shrubs growing up through the crushed concrete and asphalt surfacing.

Habitat quality on the upland portions of the site is low. While the site does contain dense vegetation along the west property line associated with the linear rail spur depression, invasive blackberry has reduced the habitat potential in this area. There is very little foraging opportunity within the remainder of the site due to the crushed concrete and asphalt surfacing. Sparse non-native grasses and forbs are present, though they represent low quality browse for terrestrial species such as deer, which would likely prefer foraging opportunities along the hillside west of the site. Terrestrial species likely to use the site include those species associated with disturbed urban sites, including raccoon and opossum.

### 2.2 Shoreline and Aquatic Habitat

The existing shoreline is composed primarily of an upland fill area and approximately 1,100 ft of steep riprap armored shoreline that abruptly transitions to intertidal mudflats and deeper subtidal areas. The shoreline of the subject property is degraded and is entirely stabilized by riprap. The top portion of the bank is characterized by sparse invasive plant species growing through asphalt, fill and riprap. Invasive shrubs such as Himalayan blackberry and scotch broom are present along portions of the top of the slope, with occasional larger shrubs such as red elderberry also present. Small trees including Pacific madrone and big leaf maple are also present in places. In addition, various invasive and non-native forbs occur along the top of the slope above the riprap.

Below the top of the slope, the upper shoreline consists entirely of riprap and is almost entirely unvegetated. The slope is fairly steep, approximately 1:1. At the base of the riprap slope (approximately +5 feet MLLW), the lower shoreline flattens to a gentler slope. The substrate immediately below the riprap slope consists of gravel and shell hash intermixed with timber pile stubs and metal debris down to approximately 0 feet MLLW. Below, the lower intertidal substrate consists of unconsolidated silt, with sparse wood waste, debris and gravel. Shellfish, primarily

clams and barnacles, are present within the mudflat habitat. Several large, derelict concrete structures and sunken barge remains are present below the toe of the riprap slope. These structures appear to have been part of the former plywood manufacturing facility.

In addition to these structures, an area of dense wooden pilings and concrete rubble is present along the northern shoreline. This debris includes approximately 70 derelict timber pile and is located waterward of the toe of the armor slope at approximately +6 feet MLLW. Over the entire shoreline, approximately 250 creosote-treated piling are present.

Habitat quality along the shoreline, both marine riparian and aquatic, is low. Vegetation along the shoreline is limited and consists mostly of invasive and non-native species. Habitat along the base of the slope is also limited. Small pockets of gravel and shell hash are present at the base of the riprap, and while these pockets could provide spawning habitat for sand lance depending on the elevation, they represent a very small percentage of the overall substrate coverage in the area. No saltmarsh or other beneficial marine aquatic vegetation was observed along the mid-to lower intertidal shoreline. As such, the site does not provide quality foraging habitat for juvenile or adult salmonids

### *2.2.1 Shoreline Armoring and Culverts*

The shoreline armoring covering the property shoreline consists of one- to two-man basalt riprap. The armoring extends from the top of the slope along the entire property shoreline (approximately +17 feet MLLW) down to the toe of the slope at approximately +5 feet MLLW. Scattered timber pile stubs are present, broken off at the riprap surface, as is occasional metal and wood debris, particularly at lower elevations on the slope.

Behind the riprap, the soil consists of fill material of unknown origin and wood debris (Pioneer 2020). The Hardel site has undergone sporadic filling over the last 150 years, and was first developed in 1924. The current configuration and armoring of the shoreline were achieved around 1980, when Hardel took over the site.

Six existing corrugated metal pipe (CMP) culvert outfalls are present along the shoreline, ranging in size from 8 inches to 18 inches in diameter. Three of the culverts are abandoned and will be plugged/removed as part of the proposed project. The other three outfalls are active and will be retained/protected.

### *2.2.2 Ecosystem-Wide Processes*

As described above, the shoreline along the West Bay Yards property is highly degraded by the presence of steeply sloped hard armoring, concrete debris and structures, and other debris. The presence of this anthropogenic disturbance has wide-ranging effects on ecosystem processes within West Bay and beyond. Steeply sloped and armored shorelines disrupt sediment processes, which can lead to increased erosion and reduced beach width (Fresh et al. 2011, Johannessen and MacLennan 2007). Additionally, wave reflection off of armored shorelines can cause scour and erosion along other beaches in the vicinity of the site, further degrading ecosystem processes bay-wide.

Biologically, the presence of the hard armoring along the site eliminates the availability of intertidal and riparian habitat. Intertidal and riparian habitat support a wide variety of native plant and animal species, including juvenile and adult salmon, shorebirds, and terrestrial birds and

mammals. Specifically, impacts to sediment processes along the shoreline from the presence of the armoring can result in changes to the invertebrate community; loss of forage fish spawning and migration habitat; loss of juvenile salmonid forage and migration habitat; and changes in the abundance and composition of shellfish (Fresh et al. 2011).

### 3 PROPOSED CONDITIONS

#### 3.1 Upland Development

The proposed project will develop a 478-unit mixed use development on the property. The development will consist of five separate buildings with above and below ground parking, utilities, and native landscaping. A public waterfront esplanade will be developed to include beach access points and other public access amenities.

A 30-foot-wide, approximately 36,500-square feet Vegetation Conservation Area (VCA) will be established and planted, extending landward from the existing OHWM to the esplanade. A mix of native trees and shrubs will be planted in the VCA, including bigleaf maple, Douglas fir, shore pine, and Pacific madrone. Native shrubs would include oceanspray, willow and elderberry. Native groundcover species to be planted in the VCA include yarrow, coastal strawberry and sword fern. The VCA will provide a buffer between the esplanade and the shoreline habitat.

Habitat functions within the VCA will include perching and foraging for raptors once the forested vegetation matures. The low trees and shrubs will also provide habitat for shore-associated birds and mammals. The vegetation within the VCA and adjacent riparian area will also contribute organic detritus and falling insects to the upper shore zone, contributing nutrients and foraging opportunities to the aquatic environment below.

##### 3.1.1 Utilities

All public utility infrastructure on-site will be installed outside of the shoreline environment and VCA, and will be designed and located to avoid impacts to shoreline ecological functions, preserve the natural landscape, and minimize conflicts with existing and planned land and shoreline uses per OMC 18.20.710 A. Project utility infrastructure will be located as far landward of the OHWM as feasible, outside of the shoreline setback at least 30 feet landward of the OHWM per OMC 18.20.710 B and all aspects of the project will adhere to all regulations outlined in OMC 18.20.710.

##### 3.1.2 Site Lighting

The Olympia SMP designates measures to minimize light pollution in shoreline areas, including Budd Inlet. OMC 18.20.60.C regulates the recreational lighting effects of the project to reduce impacts to adjoining properties. Furthermore, OMC 18.20.680.C requires that light and glare on the water be avoided to prevent spillover offsite.

#### OMC 18.20.680 C. - Recreation

Recreational use and development shall include appropriate mitigation to minimize light and noise impacts on adjoining properties. Such measures shall include, but not be limited to, fencing, vegetative screening, increased setbacks, limited hours of operation, and other appropriate measures. Where lighting is used, the illumination levels shall be the minimum needed for the

intended use. Lighting must be shielded to avoid light and glare on the water and to prevent spillover offsite.

All external lighting on the buildings, internal walkway lighting, and lighting along the shoreline esplanade will be dark sky-compliant. The use of dark sky-complaint lighting is being implemented to prevent light pollution and spillover off-site. The prevention of light trespass from the developed portions of the site into the VCA and adjacent shoreline is essential in preventing a net loss of shoreline ecological functions from lighting impacts to shoreline habitats.

All nighttime lighting will be designed to be safe and efficient by directing it only to the areas where it is needed and, by allowing and encouraging reduction or elimination of nighttime light sources where safety is not impacted per the City of Olympia Comprehensive Plan GNP.PN9.1.

Furthermore, the proposed project will limit lighting near the shoreline (to the extent practicable while achieving site safety needs) to avoid disrupting the natural development and life processes of wildlife per the City of Olympia Comp Plan GNP.PN9.2.

### **3.2 Shoreline and Aquatic Habitat**

As part of the March 31, 2021, development agreement between the developer and the City, the developer will enhance and restore the West Bay shoreline based on the restoration alternative for the Hardel site in the City of Olympia (City’s 2016 West Bay Environmental Restoration Assessment - Final Report (CHE 2016). The proposed restoration design will also meet the intent and objectives of the City’s 2012 Shoreline Master Program Restoration Plan for the restoration of Budd Inlet (City of Olympia 2012), as well as the City’s Shoreline Inventory (TRPC 2009), and the Lacey, Olympia, and Tumwater Shoreline Analysis & Characterization Report (ESA Adolfsen 2008). Please refer to the Shoreline Restoration Design Report – Alternatives Analysis prepared in response to the City’s comments on the project (Moffatt & Nichol et al. 2024) for additional information regarding how the project furthers the environmental goals of the City of Olympia.

The selection of the various shoreline restoration actions at this site was also informed by work done by the Squaxin Island Tribe in identifying a method to identify and prioritize areas throughout Budd Inlet for restoration planning and strategies. Based on the Tribe’s evaluation of the high degree of disturbance at both the site and landscape scale the recommended restoration approaches in lower Budd Inlet, including at the Project site, are creation and enhancement (Squaxin Island Tribe 2010). Elements of both of these strategies are proposed at this site, including placement of new shoreline substrate and modification of the shoreline slope to create a gently sloping beach profile, and enhancement of the intertidal, backshore, and riparian vegetation at the site to increase habitat function along the shoreline.

In addition to these approaches, the design of the proposed shoreline restoration has been guided by the Engineering With Nature® (EWN) set of principles. Developed by the U.S. Army Corps of Engineers (USACE), EWN is the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental, and social benefits through collaboration (EWN, 2024). The guiding principles for engineering with nature shoreline improvement systems include the following:

- Holistic (ecosystem approach),
- A Systems Approach (consideration that projects exist in a complex physical system, i.e.,

Geomorphologic system),

- Sustainable (consideration for resiliency for Sea Level Rise (SLR) and Climate Change relative to beach adjustment over time),
- Innovative (embracing continuous learning and prior experience),
- Adaptive (demonstrating ability to provide sustainable designs within the natural environment),
- Collaborative (Tribal, City and Regulatory input),
- Socially Responsible (aligned with values of City West Bay Restoration Plan and Tribal Restoration Interests for Budd Inlet Nearshore Enhancements),
- Efficient and Cost Effective (reducing rework and maintenance requirements),
- Science Based (being intentional to work within natural processes).

The proposed West Bay Yards shoreline and beach design alternatives have been developed based on the EWN guiding principles, as detailed in research documentation and guidance documents. Following these principles represents the standard of care and best available science for coastal engineering design of shoreline beach fill restoration and soft shore stabilization systems for Puget Sound beaches (Moffatt & Nichol et al. 2024).

### *3.2.1 Removal of Debris*

Prior to shoreline restoration, derelict concrete debris, pilings and metal beams will be removed from the shoreline mudflat and disposed of at an appropriate upland facility. This will include removal of approximately 250 timber piling<sup>1</sup> along with several large concrete structures in the lower intertidal.

Shoreline enhancement/restoration opportunities with the project include creation of intertidal beach and saltmarsh areas through substrate placement, transitional plantings along the backshore, and removal and restoration of the intertidal structure areas. The enhancement/restoration design concept maintains the existing uplands and shoreline plan form while creating fronting intertidal beach and saltmarsh areas primarily through placing beach substrates offshore of the existing revetment.

### *3.2.2 Landward Excavation of Top of Revetment*

Along the entire face of the existing shoreline armoring, a partial cutback of the top of the existing riprap revetment is proposed. This cutback of the revetment above the OHWM will extend approximately 18 feet landward and will result in an approximately 8-foot wide bench at +17 feet MLLW. Approximately 1,170 cubic yards (cy) of clean topsoil will be imported and placed on the cutback at a 4H:1V slope to match the grades from the restored beach fill at +17 feet MLLW to the fill placed for the upland development up to +26 feet MLLW. This topsoil will also provide appropriate planting media for riparian vegetation to be installed. The cutback at the top of the

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<sup>1</sup> Timber pile stubs that do not extend above the existing ground surface will be buried in place.

slope will reduce the volume of fill material required to be placed below the OHWM to create the naturally sloped beach by approximately 10,220 cy.

### 3.2.3 Placement of Fill for Beach Construction

Approximately 6,625 cy of gravel fill would be placed along the face of the existing riprap slope below the cutback and extending offshore at a slope of 4:1. This material will provide bedding for the placement of the beach material. Approximately 23,193 cy of sand and gravel beach material will be placed below the OHWM over the gravel bed at a slope of 8H:1V, extending offshore from the OHWM approximately 100-150 feet. This material will also be placed over the areas where concrete structures are removed offshore of the revetment. Saltmarsh (e.g., gumweed, pickleweed, jaumea, plantain) and transitional riparian plantings (e.g., oceanspray, willow, silverweed, tufted hairgrass) would be established along the top of the beach below the OHWM. These plantings would provide habitat to a variety of terrestrial and aquatic species, including juvenile salmonids and their prey. Additionally, the gravel beach substrate would provide enhanced spawning habitat for surf smelt, which are currently mapped as spawning immediately south of the site.

Construction of the restored beach would also enhance shoreline processes along the site by replacing the steeply armored slope with a gently sloped beach, which will prevent wave refraction and reduce shoreline erosion in other areas of Budd Inlet.

Construction of the shoreline restoration would entail the placement of approximately 29,818 cy of select fill material over approximately 165,000 square feet of aquatic substrate below the OHWM.

### 3.2.4 Aquatic to Upland Conversion

Construction of the upland improvements for the site will include the placement of fill material that will elevate the entire site by approximately two feet. This material placement atop the existing grade and the placement of the beach fill material will result in the conversion of approximately 0.43 acre of degraded aquatic area to upland habitat, as the face of the shoreline slope below the OHWM will be shifted waterward. This waterward shift in the OHWM will be minimized by the cutback of the top of the existing slope above OHW, from approximately 30 feet under previous alternatives to approximately 12-18 feet under the proposed alternative.

Raising the site by two feet will protect the upper intertidal and marine riparian shoreline from the effects of sea level rise. The raising of the site coupled with the proposed 8:1 slope of the beach will guard against wave runup during high tides and storm events. Additionally, the area proposed for conversion will be planted with native riparian trees and shrubs that will provide quality habitat for birds, mammals and other organisms utilizing the planted riparian and upper intertidal zones.

## 4 MITIGATION SEQUENCING

Mitigation sequencing is a set of steps intended to demonstrate that all reasonable steps have been taken to avoid adverse environmental impacts (OMC 18.20.410). The following sections demonstrate that appropriate mitigation sequencing has been incorporated into the project design. For the purpose of clarity, this section has been separated into the two primary project elements: the upland mixed-use development, and the shoreline restoration element. Additional details on the proposed design, approach, considerations, and alternatives for the project are described in the

West Bay Yards Shoreline Restoration Design – Alternatives Analysis (Moffatt & Nichol et al. 2024), and the Restoration and Mitigation Plan (Grette Associates 2024).

#### **4.1 Upland Development Proposal**

As described above, the proposed upland development on the approximately 19.5-acre site would include construction of a 478-unit mixed use residential and commercial development, consisting of five buildings with above and below ground parking, cafes and restaurants, a public waterfront esplanade, and associated public and private amenities.

##### *4.1.1 Avoidance*

As there are no critical areas, important habitats, or other habitat features or functioning vegetation of concern within the uplands. The site has been heavily disturbed by past industrial land uses and remediation activities resulting from those land uses. There is no functioning riparian corridor or other habitat corridors present on the site, and vegetation that does occur near the top of the shoreline slope is sparse, immature and/or invasive in nature so as to provide minimal habitat function. As such, the proposed upland development will avoid impacts to critical areas and important habitats, as they do not exist within the upland portions of the subject property.

The proposed voluntary restoration would occur through the placement of sand and gravel over the existing riprap. Based on a geotechnical assessment of the shoreline, retaining the existing revetment and placing sand and gravel beach material over it provides the highest safety factor for the stability of the revetment and the upland site behind it (LAI 2021). Removal of the revetment would lead to significant geotechnical constructability and performance issues (Moffatt & Nichol et al. 2024).

In addition, the upland site will be lifted approximately two feet through the placement of fill to address sea level rise. This will lead to a small (approximately 0.43 acre) but unavoidable loss of aquatic habitat creating a new OHWM approximately 18 feet waterward from the existing OHWM. Construction staging will be established to avoid contaminants or other construction materials from entering West Bay. A temporary staging and access point will be established in the upland area, which will not require additional improvements for construction activities. Access within the site will occur from the upland areas. To conserve the area needed, it was estimated that the construction equipment would also use approximately 0.04 acre of existing upland area. Temporary construction fencing around active work areas and temporary access restrictions to the property will be implemented. An area for stockpiling will also be established in the upland areas, to be located a minimum distance of 100 feet from the OHWM.

##### *4.1.2 Minimization*

The proposed upland project has been designed to minimize potential impacts to upland habitat. Minimizing impacts to the existing, sparse riparian vegetation was considered through the preservation of existing native trees and shrubs along the shoreline. However, this was deemed infeasible as most of the riparian vegetation is growing up through asphalt and concrete rubble, and grading would be necessary along the entire top of bank to ensure the transition grades from the finished site to the restored shoreline are appropriate. Therefore, minimization through the preservation of this existing vegetation was not possible.

### 4.1.3 Restoration

Impacts to the existing low-quality riparian habitat would be restored through the restoration of a native riparian corridor along the entire site shoreline. To comply with OMC 18.20.492-18.20.496, a densely planted native VCA will be established along the entire 1,100-foot waterfront, extending approximately 30 feet landward from the existing OHWM. This approximately 36,500-square feet VCA would consist of native coniferous and deciduous trees and shrubs and would screen the shoreline from the upland uses, while also providing enhanced terrestrial habitat functions. Additionally, the conversion area between the existing and proposed OHWM (approximately 12-18 feet wide and 18,743 square feet) will be planted with native riparian vegetation. Along with the VCA, trees will be included in a tract on-site. Two identified tree tracts along the shoreline are along the northern and southern portions of the shoreline. This is to preserve the required viewsheds from the site across the bay and towards the capital.

A mix of native trees and shrubs will be planted in the VCA and riparian area, including bigleaf maple, Douglas fir, shore pine, and Pacific madrone. Native shrubs would include oceanspray, willow, and elderberry. Native groundcover species to be planted in the VCA include yarrow, coastal strawberry, and sword fern. The VCA will provide a buffer between the esplanade and the shoreline habitat. Restoration of this native riparian corridor would provide a significant increase in function over the existing conditions at the site, and would offset the removal of the existing sparse, largely non-native riparian vegetation present.

## 4.2 Shoreline Restoration Proposal

As a condition of the March 31, 2021, development agreement with the City, the developer will conduct shoreline restoration actions along the entire length of the project site shoreline. Several restoration design alternatives were evaluated for the project to ensure the project meets the intent of OMC 18.20.410 with respect to no net-loss of shoreline ecological functions and mitigation sequencing. Detailed descriptions of the alternatives evaluated for the project and of the proposed preferred alternative are provided in the Shoreline Restoration Design Report – Alternatives Analysis (Moffatt & Nichol et al. 2024), and in the Restoration and Mitigation Plan (Grette Associates 2024).

### 4.2.1 Avoidance

The proposed shoreline restoration actions have been designed to be consistent with the City's 2016 West Bay Environmental Restoration Assessment - Final Report (CHE 2016). Consistent with the design in that report for the Hardel site, the shoreline restoration proposal would utilize the existing riprap armoring to provide structural stability for the restored beach, thus avoiding potential environmental impacts from removing the existing material. As described in the Geologic Hazards Assessment prepared for the site, removal of the existing riprap would result in an unacceptable factor of safety for the shoreline slope (LAI 2021).

The No-Action alternative, while avoiding impacts to the aquatic environment on the site in the short term, would not accomplish the purpose and need of the shoreline restoration action (i.e., habitat restoration and public access). Additionally, the existing revetment would still require on-going maintenance and repair to continue its function of protecting the site uplands from erosion and destabilization. The concrete debris and rubble, and the creosote-treated pile stubs would also

remain and continue to degrade the habitat quality of the site. Therefore, impacts to the aquatic environment are unavoidable for any design alternative, including the No-Action alternative.

#### *4.2.2 Minimization*

The project has been designed to minimize impacts to the shoreline to the greatest extent practicable. The preferred alternative, including the cutback of the top of the revetment and the design of the restored shoreline slope at 8H:1V, results in the least amount and extent of fill material placement to create a gently sloped beach for habitat enhancement, while also providing wave energy dissipation and backshore protection from erosion and impacts related to sea level rise.

As noted above, full removal of the existing revetment would result in an unacceptable safety factor for the shoreline slope (LAI 2021). Therefore, leaving the revetment in place and covering it with select fill material to create a gently sloping intertidal beach is the design alternative that results in the least impact to the site and the shoreline environment while accomplishing the purpose and need of the project of restoring habitat and providing public access. Furthermore, the preferred alternative of cutting back the top of the revetment maintains an acceptable safety factor while minimizing the waterward shift of the OHWM, resulting in less fill placed waterward of OHW and minimizing the conversion of degraded aquatic habitat to uplands.

Additional information regarding the minimization of impacts to the shoreline habitat at the site can be found in the Shoreline Restoration Design Report – Alternatives Analysis (Moffatt & Nichol et al. 2024).

#### *4.2.3 Restoration*

Unavoidable impacts to low-quality shoreline and aquatic habitat from the preferred design alternative would be restored through the enhancement and restoration of those same habitats on the site. Existing wood piles, concrete debris, and metal waste would be removed from the shoreline. The top of the existing riprap revetment above the OHWM would be cut back. Select gravel and beach material would be placed over the existing riprap at a slope of 8H:1V, creating a gently sloped beach. The upper beach would be planted with native transitional shrubs and saltmarsh vegetation and large woody debris would be installed, providing important habitat functions to several listed and important species. Below the saltmarsh, the beach would also provide high-quality habitat for forage fish spawning.

The restoration proposal has been designed to be consistent with the intent and objectives within the City's 2016 West Bay Environmental Restoration Assessment - Final Report as well as the City's 2012 SMP Restoration Plan for Budd Inlet. The design has also been informed by the USACE's EWN® design principles, which represent the standard of care and best available science for coastal engineering design of shoreline beach fill restoration and soft shore stabilization systems for Puget Sound beaches (Moffatt & Nichol et al. 2024). Following the design intent and guidelines in these documents, the proposed shoreline restoration design will result in a significant increase in the habitat functions and shoreline processes provided by the site shoreline to Budd Inlet.

#### 4.2.4 Compensation and Monitoring

As described above, the conversion of aquatic area to uplands resulting from the placement of fill material over the face of the existing riprap revetment is unavoidable. Information detailing why the preferred alternative necessitates this conversion and how that conversion has been minimized to the greatest extent practicable is presented in the Shoreline Restoration Design Report – Alternative Analysis (Moffatt & Nichol et al. 2024).

As discussed above, raising the surface elevation of the site two feet to address sea level rise and cutting back the top of the revetment along the shoreline results in the incidental conversion of 18,743 square feet (0.43 acre) of highly degraded and armored aquatic area to uplands. This area currently consists entirely of unvegetated, steeply-sloped riprap. The proposed project will compensate for this loss of aquatic area by removing 250 creosote-treated timber pile, 7,058 square feet of concrete debris and structure, and various metal debris along the shoreline. Additionally, the project will create 3.49 acres of high-quality sand and gravel beach with native saltmarsh, transitional and riparian vegetation.

With respect to review under OMC 18.05.855, the only amenities that will be located within the “new” uplands resulting from the placement of upland fill and the in-water restoration project are planted native vegetation and public access to the shoreline (providing a public benefit). The uplands being created through the addition of fill material on the riprap armored slope are incidental to the completion of the shoreline restoration project, which is the only option for this area, and not for purposes of creating developable land. All setbacks for the project, including the 30-foot VCA and the 100-foot shoreline setback for the Urban Intensity shoreline designation, are measured landward from the existing location of the OHWM.

In addition to the creation of the beach, vegetated marine riparian corridor, and the VCA, the project proponent will monitor the shoreline restoration components for a period of ten years to document the constructed habitats function as anticipated. This monitoring includes a contingency and adaptive management plan to ensure that if aspects of the shoreline restoration are not performing as required, proactive measures can be taken to correct any deficiencies. The monitoring and adaptive management plans can be found in the Restoration and Mitigation Plan submitted for the project (Grette Associates 2024).

## 5 NO NET LOSS ANALYSIS

### 5.1 Upland Project Development

As described above, the current habitat function on the upland portions of the property is degraded from past industrial land uses and site remediation activities. Existing upland vegetation consists of sparse and primarily non-native vegetation growing up through crushed concrete and asphalt surfacing. Riparian vegetation is rare and consists of lone small trees and shrubs rooted through asphalt, crushed concrete rubble and riprap. Under the proposed project, the entirety of the uplands will be cleared, graded and developed, and a 30-foot-wide VCA totaling approximately 36,500 square feet and a 12-18-foot-wide riparian corridor totaling approximately 18,743 square feet will be established landward of the proposed OHWM of the site.

### 5.1.1 Site Lighting

Artificial shoreline lighting has the potential to change the nighttime ambient light regime and may alter nighttime light-induced behaviors for wildlife within the shoreline area (Williams and Thom 2001). The implementation of the dark-sky compliant measures to minimize light pollution will eliminate the sharp shadow edges and artificial patterns that influence these behaviors. Furthermore, the bollards and proposed lighting fixtures along the VCA, waterfront esplanade, and cantilevered overlook areas will be positioned in a manner to eliminate light transmission into any potential riparian and low-tide aquatic habitat.

Dark sky-compliant lighting fixtures shield the light source to minimize glare and light pollution to surrounding areas. Utilizing these fixtures along the waterward edge of the esplanade will minimize light intrusion into the VCA and riparian corridor, thereby minimizing habitat impacts. Likewise, the use of dark sky-complaint lighting on the buildings and associated infrastructure will also prevent light trespass from the developed portions of the site into the VCA and adjacent shoreline. The use of the dark sky-compliant lighting fixtures will ensure the project development will not result in a net loss of shoreline ecological functions with respect to site lighting.

### 5.1.2 Upland Functional Lift

Evaluation of a shoreline-related project with respect to no net loss of shoreline ecological functions must include an analysis of the existing habitat functions present at the site compared with the anticipated habitat functions present after the completion of the project. The difference in relative habitat function between the existing condition and post-project condition is a reflection of the “functional lift” provided by the project.

The new VCA and riparian corridor would be planted with a diverse assemblage of native coniferous and deciduous trees and shrubs that would provide screening of the shoreline from upland uses while also contributing organic material to the upper beach. This area will extend the entire approximately 1,100 feet of shoreline on the site, totaling approximately 55,243 square feet (1.25 acres), and will result in a significant increase in riparian habitat function over the existing condition. Enhanced habitat functions provided by the restored VCA and riparian corridor will include avian perching and foraging, screening of shoreline habitat from upland uses, and thermal regulation of the upper intertidal shoreline.

The presence of three public beach access points will encroach within the VCA a total of 540 square feet. To compensate for this minor encroachment, the VCA will be expanded landward 540 square feet at the south end of the VCA. The small size of the access points (6 feet wide), dense native plantings along their margins, and the commensurate expansion of the VCA will ensure there is no degradation of shoreline functions due to the presence of these access points.

Marine riparian areas provide several important functions that support nearshore and terrestrial ecosystem processes, such as water quality improvement, fine sediment control, inputs of large woody debris, shade/microclimate, organic detritus input, slope stability, and fish and wildlife habitat (Brennan et al. 2009). These areas also prevent erosion from storms and buffer upland areas from the effects of sea-level rise.

Water quality improvements and fine sediment control are enhanced through the presence of dense native vegetation in functioning riparian corridors. Riparian vegetation filters toxins and

sediments from surface and groundwater, reducing pollutants through soil binding and conversion of nutrients while also preventing fine sediment intrusion into sandy and gravelly beach substrates. Riparian vegetation also regulates water temperatures in runoff through shading. Enhancement of these water quality functions through the shoreline restoration actions proposed for this project will significantly improve the habitat quality for those fish and wildlife species that will utilize the restored beach such as adult and juvenile salmonids, forage fish, great blue heron, and shorebirds.

Enhancement of functions such as shading, large woody debris presence and recruitment, and organic detritus input will significantly improve the habitat quality along the site shoreline. Terrestrial and aquatic microclimates are influenced by shade provided by riparian vegetation (Brennan et al. 2009). Those microclimates in turn contribute to higher species diversity and abundance within riparian habitat (Brennan and Culverwell 2004).

Riparian vegetation along shorelines affects soil and slope stability in several ways, from mechanical reinforcement and restraint by the roots and stems to modification of slope hydrology as a result of soil moisture extraction (Brennan and Culverwell 2004). The enhancement of these functions along the shoreline within the restored VCA will minimize erosion potential and fine sediment input into the aquatic environment downslope.

Based on the above analysis, the proposed upland project development will result in a net increase (i.e., lift) in shoreline ecological functions and processes through the restoration of a functioning riparian corridor along the entire length of the site.

## **5.2 Shoreline Restoration**

As described above, the shoreline habitat function along the site is degraded from the presence of a steep, armored slope consisting of riprap that abruptly transitions to a broad mudflat containing metal, wood and concrete debris. This unvegetated, armored shore reflects wave energy back out into Budd Inlet, contributing to erosion in other areas of the bay. The existing habitat function along the shoreline is of low quality, providing minimal habitat for terrestrial and aquatic species, including juvenile salmonid foraging or forage fish spawning.

The proposed shoreline restoration would entail the placement of gravel and beach fill material approximately 100-150 feet waterward of the OHWM over approximately 165,000 square feet of low-functioning riprap slope and mudflat. The beach material would be placed at slope of 8H:1V, creating a gently-sloped beach that would provide high quality habitat for forage fish spawning. The upper intertidal beach would be planted with native saltmarsh vegetation, providing high quality foraging habitat for juvenile salmonids, while the upper beach transition zone would be planted with a variety of native shrubs. This vegetation will not only benefit aquatic species, but other important species that rely on functioning nearshore ecosystems such as great blue heron.

In addition, the proposed actions will provide a clean sediment cap to eliminate or minimize potential aquatic exposures to known chemical constituents in West Bay sediment (e.g., dioxins/furans, polycyclic aromatic hydrocarbons) that may be present near the property.

The following sections detail specific elements of the project to address impacts to shoreline function per OMC 18.20.710 and the recent comments from the City.

### 5.2.1 Shoreline Functional Lift

There are numerous ways to evaluate a project with respect to functional lift. As part of the City of Olympia (City)'s 2016 West Bay Environmental Restoration Assessment – Final Report (CHE 2016), the proposed project site was evaluated using both a habitat value quantification model as well as a qualitative evaluation framework to describe the functional lift in habitat value that could be expected from the preferred restoration alternative.

The habitat value quantification model provides a relative, science-based quantification of the habitat improvements. The habitat valuation model used in CHE 2016 used four primary inputs: existing habitat type value, proposed habitat type value, size, and years to maturity. Sites were then normalized for size by determining the habitat “points per acre”. Based on this model, the Hardel site received 21.84 habitat points/per acre, ranking it fifth out of the twelve sites assessed in the report for functional lift potential (CHE 2016). This ranking illustrates that the Hardel site (i.e., project site) exhibits a potential for providing significant functional lift through the restoration design contemplated in CHE 2016 (and proposed herein).

The qualitative evaluation framework was utilized in the report to provide a means of assessing important restoration elements that were difficult to quantify. Based on this framework, the Hardel site scored sixth out of the twelve alternatives for the metrics chosen by the report authors. These metrics include sediment supply and transport, underrepresented habitats, resiliency, and providing recreational compatibility (CHE 2016). Again, this ranking illustrates the site has a relatively high potential for providing significant functional lift among shoreline ecological processes that are difficult to quantify in a numeric model.

Further evaluation of the proposed shoreline restoration actions is possible when assessing the actions against the management measures identified in *Management Measures for Protecting and Restoring the Puget Sound Nearshore* (Clancy et al. 2009). These management measures represent a broad range of actions that can be applied individually at specific sites or combined into larger restoration and protection efforts. The management measures incorporated into the proposed shoreline restoration actions include:

- Armor removal or modification
- Beach nourishment
- Debris removal
- Large wood placement
- Revegetation
- Species habitat enhancement
- Substrate modification
- Topography restoration

Several of these measures are described as being “primary restorative measures”, such as armor removal, topography restoration and revegetation. These measures “exert long-lasting effects on ecosystem processes and will often provide the best chance of achieving complete restoration of processes.” (Clancy et al. 2009). The remaining measures included in the proposed shoreline restoration action are described as “supplementary enhancement measures”, which “includes mainly structural measures that provide immediate but often short-lived benefits in terms of habitat

structure.” (Clancy et al. 2009). Taken as a whole, these measures will provide for both the near-term increase in structural and habitat function (e.g., large wood placement, debris removal, beach nourishment/substrate modification) as well as the long-term sustainability of the ecosystem processes provided by the restored site (e.g., armor modification, topographic restoration, revegetation). The result is a restored shoreline that immediately enhances the physical and biological elements of the ecosystem, while also promoting the durability of the ecosystem processes that sustain those elements.

The results of these evaluation methods demonstrate that the proposed shoreline restoration action will result in a significant increase in shoreline ecological functions and processes over the existing shoreline condition. This represents a significant habitat functional lift resulting from the proposed shoreline restoration and VCA establishment.

### *5.2.2 Aquatic to Upland Conversion*

Installing and maintaining an upland cap/cover will most likely be a requirement of the selected Model Toxics Control Act (MTCA) remedy for the site (PIONEER Technologies Corporation 2021). As such, the uplands will consist of topsoil fill which will elevate the upland area by two feet. This fill will also elevate the site to offset the effects of sea level rise. In addition, the top of the existing revetment will be cutback from the location of the existing OHWM, extending approximately 18 feet landward. Gravel and beach fill material will be placed on the top of the existing riprap to create the gently sloping beach. Topsoil fill will be placed on the cutback slope above OHW to match the grade between the top of the upland fill and the top of the beach fill at a slope of 4H:1V.

This material placement atop the existing riprap will result in the conversion of approximately 18,743 square feet (0.43) acre of degraded aquatic habitat to upland habitat. Placement of the proposed beach fill will result in the incidental shift of the OHWM further waterward. The creation of intertidal beaches, salt marsh, and riparian planting will substantially improve substrate quality and enhance ecological functions of existing natural resources and their buffers. The removal of derelict structures including 179 creosote-treated piles, the outline of a dilapidated timber dock, an old concrete structure, various concrete debris, metal iron beams, wood logs, rock, and iron pipe will improve habitat function and water quality. The proposed actions will provide improved habitat for fish and other natural resources, and improve ecosystem services, water quality, and nutrient storage to increase ecosystem stability over time. Overall, the proposed 0.43-acre habitat conversion area will lead to a substantial improvement to the nearshore habitat, resulting in a substrate with higher primary productivity of epibenthic organisms with improved migration and foraging habitat.

With respect to review under OMC 18.05.855, the only amenities that will be located within the “new” uplands resulting from the shoreline restoration project are planted native vegetation within the VCA and public access to the shoreline (providing a public benefit). The uplands being created through the addition of fill material over the riprap armored slope are incidental to the completion of the shoreline restoration project, which is the only option for this area, and not for purposes of creating developable land. Creation of the “new” uplands also will not affect the location of the setbacks associated with the OHWM. The 100-foot shoreline setback for the Urban Intensity

shoreline designation and the 30-foot VCA will be measured from the existing OHWM and not the new, waterward OHWM resulting from the shoreline restoration.

### 5.2.3 *Sediment Transport and Littoral Drift*

The existing shoreline of the Project Area consists of angular spalls and riprap, concrete debris, wood debris, and concrete structures, along a steepened bank. The cutback of the top of the slope, placement of sand and gravel over the existing armored slope, removal of derelict creosote-treated timber piles, and removal of concrete structures will temporarily increase turbidity and transport some sediment into Budd Inlet as is the design of the shoreline restoration's riparian planting. The riparian planting area consists of a small elevation of topsoil fill over the cutback area to provide appropriate planting media and match grades between the upland area and the natural beach slope. The material placement atop the existing grade below the OHWM will result in the conversion of 0.43 acre of degraded aquatic habitat to upland habitat. This proposed action will result in the shift of the OHWM approximately 12-18 feet waterward away from the area of upland fill. The creation of intertidal beaches, salt marsh, and riparian planting will substantially improve substrate quality and enhance ecological functions of existing natural resources, and their buffers.

Littoral drift is not a constant process at any given site. The process varies drastically based on wave action, wave direction and distance of wave runup, and is commonly reversed in drift during strong storms. (McLachlan & Brown, 2006). The Washington State Department of Ecology (Ecology) provides mapping of littoral drift along shorelines of Puget Sound and has identified 'no appreciable drift' for the southwestern shoreline of West Bay (from the Fifth Avenue Dam at the south to the West Bay Marina to the north) that includes the project site (Ecology 2021). The southwestern shoreline of West Bay is armored and there are no sources of sediment (such as feeder bluffs) within this stretch of shoreline (Grette 2009, Ecology 2021). Please also refer to the Shoreline Restoration Design Report – Alternatives Analysis prepared for the project (Moffatt & Nichol et al. 2024).

As such, given 'no appreciable drift' at the site and a lack of sediment sources along this stretch of shoreline, construction of the proposed project is unlikely to adversely or beneficially impact littoral drift and sediment transport processes. Therefore, there will be no net loss of sediment generation or littoral drift functions or processes resulting from construction of the project.

### 5.2.4 *Habitats and Species*

Restoration of a functioning shoreline and riparian corridor along the land/water interface of the site will provide significant increases in ecosystem processes that will benefit habitats and species within West Bay.

Creation of a gently-sloped sand and gravel beach at the site will provide numerous benefits to important species in West Bay. WDFW maps spawning grounds for surf smelt on the south half of the of the project site. The existing shoreline revetment severely limits the available substrate and elevations upon which surf smelt can spawn. The proposed project would create a beach where appropriately-sized spawning substrate is placed along the shore. Additionally, planting saltmarsh and overhanging shrub and tree vegetation would provide shade for incubating eggs, which is an important habitat attribute in the summer months (Pentilla 2007).

The upper intertidal zone of the shoreline will be planted with native saltmarsh vegetation. This vegetation provides numerous benefits to important species, including juvenile Chinook salmon. Saltmarsh provides an important link in the food web of juvenile salmon, supporting a diverse assemblage of prey resources and providing organic detritus. The presence of abundant and diverse prey resources promotes high growth rates and allows juvenile salmon to quickly outgrow predators (Fresh 2006).

The transitional and riparian zones immediately above the saltmarsh vegetation will be planted with a diverse assemblage of native trees, shrubs and groundcover vegetation. This vegetation will significantly enhance the physical and biological attributes of the ecosystem services provided by the shoreline of the site. These attributes and services include the following (Brennan 2007):

- Contribution of standing and downed large woody debris which increases habitat structure and organic detritus;
- Promotion of slope stability and prevention of erosion through root structure and drainage control;
- Production of prey resources for upper intertidal and nearshore vertebrate organisms; and
- Filtering of runoff to trap contaminants and fine sediment.

### **5.3 No Net Loss Summary**

Based on the analyses above, the overall proposed project (including both the upland and shoreline restoration elements) will result in a net increase in shoreline ecological functions and processes. The nearly unvegetated existing riparian zone will be replaced with a 30-foot wide, densely-planted native VCA totaling approximately 36,500 square feet. The “created” riparian area between the new OHWM and the VCA totaling approximately 18,743 square feet (0.43 ace) will also be planted with native trees and shrubs. Also, the steeply armored, low functioning shoreline will be restored to a gently sloping beach with the upper shore planted with saltmarsh and transitional shrubs.

As designed, the proposed project addresses several restoration priorities described in the City’s 2012 SMP Restoration Plan (Chapter 6), along with many of the management measures described in Clancy et al. 2009. Among others, the Restoration Plan priorities include restoring riparian vegetation; restoring and improving wildlife habitat; restoring natural sediment transportation processes; reducing shoreline armoring and restoring shoreline conditions and processes; restoring tree canopy coverage along shorelines; and restoring estuarine transition habitat and intertidal influence. Based on the proposed conditions described above of the upland development and shoreline restoration actions, the proposed project address all of these priorities along the project site shoreline.

Beach nourishment and restoration projects in Puget Sound have a history of significantly increasing habitat contributing to no net loss of habitat viability or function. Beach nourishment is a common technique used for shore protection and habitat enhancement. Beach nourishment applications and project elements have increased in recent decades as hard armor has become less desirable due to negative habitat impacts, down-drift sediment reduction, and increasing costs (Finkl and Walker 2005). Beach nourishment has most often been used in the Puget Sound region to reestablish broad beach profiles that act as buffers against wave attack, and to mitigate erosion of the upper beach and backshore areas and typically range from several thousand feet for larger

projects. The length of shoreline restoration of the West Bay project correlates with the length and highly relevant overall approach and performance of similar beach nourishment actions (Johannessen et al. 2014).

As such, the project as proposed meets the intent and objectives of the City’s SMP Restoration Plan for Budd Inlet, the City’s Comprehensive Plan land use policies described in Policy 6.7, and satisfies the requirements of OMC 18.20.410. The proposed project will result in a net benefit to shoreline ecological functions and processes.

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**Attachment A – Site Photographs**

**Photograph 1. Typical upland site habitat, looking to north.**



**Photograph 2. Typical riparian conditions along top of shoreline slope.**



**Photograph 3. Vegetated area along rail spur adjacent to West Bay Drive.**



**Photograph 4. Typical steeply sloping shoreline armoring along shoreline slope.**



**Photograph 5. Typical mudflat conditions along property shoreline. Note presence of wood and metal debris from prior land uses.**



**Photograph 6. Large concrete structures, debris and piling to be removed, located immediately waterward of property shoreline.**

