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MEMORANDUM

To:	City of Ilwaco
From:	Moffatt & Nichol on Behalf of Port of Ilwaco
Date:	June 2023
Subject:	**Port of Ilwaco East Bulkhead Resilience Project** **Mitigation Sequencing and No Net Loss Narrative**
M&N Job No.:	213282

Introduction

The City of Ilwaco (City), Washington's Shoreline Master Plan (SMP) section 6.3(1) requires that projects protect the critical area at a project site so that project actions result in no net loss of critical area functions and values. The proposed Port of Ilwaco Bulkhead Resilience Project will meet the no net loss objective through avoidance, minimization and compensatory mitigation for environmental impacts from the project action. This memorandum summarizes a Mitigation Sequence Analysis as required by the City [SMP6.3(3)] in their pre-application meeting comment letter dated 2 May 2023 (attached).

Existing Conditions

The project site is located on the east side of the Safe Coast Seafood wharf in the northwest portion of the Port of Ilwaco Marina in Ilwaco, Washington. The marine, benthic, and shoreline habitat are disturbed habitat based on the use and maintenance of the marina as described below. Eelgrass is not present at the project site based on the eelgrass survey completed in 2022 (GeoEngineers 2022).

The existing bulkhead, to be replaced as part of the project, consists of a creosote treated timber pile and pile cap bulkhead apparently tied back with cable tie backs to deadman piles near the seafood facility buildings. The existing bulkhead is leaning waterward as much as 10 degrees in places and is in poor condition. Bulkhead movement waterward has been observed since monitoring began in November 2022.

Figure 1. Damaged Bulkhead Wall

The paved driveway west of the bulkhead, to be regraded and repaved as part of the project, shows signs of settlement and damage from piles protruding through the pavement and represents additional indication of bulkhead movement and associated settlement behind the bulkhead. The head of the adjacent slip is occupied by a creosote treated timber revetment and various logs at the toe of the slope and grasses and low vegetation are located along the top of the slope.

Figure 2. Drive Settlement

Various creosote-treated timber piles and features are located within the adjacent marina slip. The slip is part of the busy Ilwaco Marina that is actively used by tenants (including vessels accessing Safe Coast Seafoods) and visiting vessels and is periodically dredged to maintain permitted depth to accommodate the draft of the vessels using the marina. The disturbed habitat in the marina provides lower function and value as habitat to marine species based on the baseline conditions and use of the facility.

Proposed Project

The proposed Project is required for improved the safety, efficiency, and reliable use of the wharf. The Port is a key hub for commercial fishing, seafood and aquaculture processing, and recreation activities that greatly benefit the regional economy. The commercial fishing wharf, operated by Safe Coast Seafoods, is one of the most active in the state, landing roughly $14 million in commercial seafood each year. Repair of the bulkhead wall is critical to ongoing operations at Safe Coast Seafoods. In its current condition, the bulkhead is in serious structural condition and at risk of failing. Recent biweekly and monthly measurements have been completed to monitor ongoing movement of the bulkhead. The monitoring has recorded movement along 13 monitoring points along the face of the bulkhead ranging from approximately 0.06 inch to up to 0.31 inch waterward since monitoring began in November 2022. The monitoring indicates that the bulkhead is the process of active failure. Frequent flooding due to high water levels from "king tides" and severe winter storm surges further threaten the structural capacity of the bulkhead.

Bulkhead failure would shut down cargo operations at the Port and negatively impact a wide variety of businesses in maritime and non-maritime sectors including Safe Coast Seafoods. The shutdown of the Safe Coast site due to failure of the bulkhead would lead to a series of economic impacts for many more

workers and businesses and the region. Bulkhead failure would also adversely affect the Port of Ilwaco Marina operations, likely fully blocking at least one slip from use and potentially causing damage to adjacent float structures and tenant vessels. Until this Project is completed, the facility is capacity-limited and at risk. The main access driveway to Safe Coast Seafoods has been blocked based on recommended load limitations in an effort to minimize vibration and load resulting from vehicles and machinery using the driveway located adjacent to the failing bulkhead. Without the Project, the eventual closure of the wharf will have cascading negative transportation and economic impacts for the region.

The proposed project includes the following elements as summarized in the project JARPA and JARPA figures (Sheet 1 through 9):

- Replacement of the existing bulkhead by removing limited portions of the existing creosote-treated timber bulkhead to accommodate placement of a new steel sheetpile bulkhead with steel cable tiebacks. The new bulkhead must be placed waterward of the existing bulkhead due to the instability of the existing structure and the risk of failure of the wharf and potential damage to the adjacent seafood facility structures during construction if the bulkhead was removed.
  The bulkhead sheetpiles will be driven using a vibratory hammer. Impact hammer proofing may also be required to drive the sheetpiles to the final design elevation. Additional construction details are summarized in the attached project Joint Aquatic Resources Permit Application (JARPA) and affiliated drawings. A portion of the concrete rubble slope protection on the south end of the bulkhead will be moved and replaced with riprap to accommodate installation of the new bulkhead and maintain slope protection/stability.
- The access drive located behind and to the west of the bulkhead will be regraded and repaved as part of the bulkhead replacement.

Mitigation Sequence Analysis

The following mitigation sequence analysis is provided pursuant to City of Ilwaco SMP 6.3(2) and (3) and as requested by the City in a letter dated 2 May 2023. The project will implement Best Management Practices (BMPS)/avoidance and minimization measures (AMMs) during demolition and construction as described in Section 8.a. of the project JARPA (attached). The BMPs will avoid and minimize impacts to the environment to the extent practicable and include general construction and demolition BMPs; in-, over-, and near-water specific BMPs; creosote and pile removal BMPs; pile installation BMPs; and BMPs associated with overwater concrete placement.

The following mitigation sequence will be completed for the project and is presented as described in the Ilwaco SMP.

A. Avoidance

The proposed project only consists of maintenance and replacement/repairs to existing structures. The site use and purpose will not change. No "overall" expansion of the footprint is proposed, only that necessary to replace the bulkhead.

Several alternatives were considered prior to identifying the preferred alternative. The following is a summary of the alternatives considered and how they were evaluated as the Project was developed.

- *No Action*
  - The existing creosote treated timber bulkhead is actively failing with observed movement of up to 0.3 inch since monitoring began in November 2022.
  - Left as-is, the bulkhead will eventually fail, which will result in:
    - Permanent access removal by permanently blocking the access driveway adjacent to the bulkhead,
    - Potential damage to buildings/building foundations,
    - Life/safety issue for Safe Coast Seafood workers and marina tenants,
    - Inability for Safe Coast Seafood to maintain operations resulting in loss of income and revenue for this small community.
    - Obstructing a portion of marina (adjacent slip) and making it unusable.
- *Removal of bulkhead prior to construction of new bulkhead wall*
  - No bulkhead as-builts are available to identify how the existing bulkhead was constructed. Associated unknowns increase the risk of removing the structure prior to replacement. Removing the existing structure prior to replacement poses a high risk of slope failure and damage to:
    - the access drive,
    - Safe Coast building foundations, and
    - adjacent marina slip (including obstructing access to parts of the marina and potential damage to float structures).
  - Bulkhead failure would pose unacceptable risks to life/safety for Safe Coast Seafood workers and marina tenants.
- *Sheetpile bulkhead placement behind existing bulkhead*
  - No as-builts: The bulkhead appears to be supported by cable tie backs, possibly anchored to deadman piles behind/shoreward of the bulkhead. There is a potential for:
    - Increased risk of failure if sheet piles were driven behind the existing wall, severing the support provided by the cable tiebacks.
    - Unknown obstructions that could damage or impede sheetpile installation, increasing cost, delays and potential risk of existing slope failure.
  - The Project area is restricted by the continued business need for the adjacent access drive and the close proximity of the facility buildings and infrastructure. Space limitations also pose constructability challenges relative to pile and cap placement for a new bulkhead.
- *Cantilever bulkhead waterward of the existing bulkhead*
  - The cantilever option placed waterward of the existing bulkhead would have essentially the same impacts to marine habitat as the Preferred Alternative and would also require placement of filter rock backfill in the space between the new and the existing bulkhead.
  - The placement of the cantilever and Preferred Alternative is dictated by the

profile of the existing bulkhead which is leaning waterward by as much as 10 degrees in places and the need for a usable temporary berth area to replace the berth area rendered unusable by the deteriorated and unstable nature of the existing bulkhead.
    - The cantilever option would require more steel as the bulkhead sheetpiles would be both longer and thicker to provide the necessary slope support at the site. The requirement for more steel will result in a higher cost to the Port.
- *Preferred Alternative – Anchored Sheetpile Bulkhead*
    - The Preferred Alternative will result in commensurate environmental impacts (approximately the same footprint, backfill volume, etc.) as the cantilever bulkhead alternative and, similarly, be the least environmentally impactful and will be a more economical solution for the Port.
    - The proposed placement of the bulkhead is controlled by the waterward lean of the existing bulkhead face and Safe Coast's need to replace the existing unusable temporary berth area with a usable temporary berth to support the facility's operations.
    - The size of the space/void between existing and replacement bulkheads results from the way the bulkhead leans waterward and the need for a usable berth area to replace existing one for Safe Coast Seafood operations.

Avoidance and minimization measures (AMMs) and BMPs will be implemented during construction to avoid and/or minimize impacts to wildlife. See the attached JARPA and Biological Evaluation for a full list of measures to preserve or enhance wildlife. Key AMMs/BMPs include:

- In-water construction activities will comply with the in-water construction window (anticipated to be November 1 through February 28)
- During any in-water and embankment work, containment booms will be used to surround the work areas or separate embankment work from surface water.
- Steel piling will be installed with a vibratory hammer when possible. Impact hammering will start with light tapping, then increase to full force gradually.
- A bubble curtain and one or more other noise attenuation methods will be used during impact installation or proofing of all steel piling.
- Where possible pre-cast concrete features will be used in lieu of cast -in-place concrete features.
- Uncured concrete will not be allowed to come into contact with the surface water for cast-in-place features.

The creosote treated timber revetment on the north end of the adjacent slip will be replaced with riprap shore protection rather than replacing in kind with a concrete revetment in the same location.

Additionally, the temporary berth for vessels along the bulkhead will be rehabilitated by adding anchor features (e.g. steel cleats) along the top of the new bulkhead wall versus incorporating fender piles and fender features that were eliminated as the design progressed. The final design eliminated the piles and features associated with the fenders thus avoiding the associated additional overwater and benthic impacts associated with such features.

B. Minimization

All federal, state, and local project permit requirements will be adhered to avoid and minimize impacts to protected species and habitat. Minimization measures associated with the proposed project BMPs include the use of steel sheetpiles (vs. treated timber or concrete piles) which minimizes the footprint of the structure to the extent practicable, placing sheetpiles using a vibratory hammer will limit or eliminate the need for impact pile driving except in those instances where the piles need to be driven to their final design elevation with impact proofing due to harder driving conditions at depth. Additional pile installation BMPs and monitoring (marine mammal monitoring) will be implemented to minimize pile driving noise impacts (e.g. bubble curtains, soft starts, etc.) and containment booms will be used during demolition and construction to prevent debris and sheen that may be associated with the creosote pile and feature removal. See the attached JARPA for additional impact minimization BMPs proposed for the project.

The proposed bulkhead has been sited as close to the existing bulkhead as possible based on the condition and lean of the existing, failing bulkhead while maintaining the purpose and utility of the structure as a temporary berth for vessels on- and off-loading at the Safe Coast Seafood facility. The proposed location for the new bulkhead construction minimizes the new overwater coverage, benthic habitat impacts, and fill placement (drainage rock placement in the space between existing and new structures) required to construct the new bulkhead to the extent practicable while maintaining the facility's purpose and utility.

C. Rectify the impact by repairing, rehabilitating, or restoring the affected environment.

Approximately 350 sf of concrete rubble will be removed to accommodate construction of the new bulkhead. The concrete will be removed from the marine environment and replaced with 350 sf of rip-rap shore protection. This will remove approximately 14 cy of concrete from the marine environment (below HTL). An additional 50 sf (2 cy) of concrete rubble slope protection will be removed from above HTL in the same area, removing more concrete from the shore environment. The removal of concrete improves the marine and shore environment improves site habitat conditions by eliminating concrete and its potential impacts on pH and marina chemistry from the site at these locations.

D. Reduce or eliminate the impact over time by preservation and maintenance operations.

The project includes removal of creosote from the environment by removing limited portions of the existing bulkhead. The amount of the existing bulkhead removal is limited by the condition and instability of the existing structure and additional removal of the bulkhead structure risks catastrophic failure of the wharf which has the potential to endanger Safe Coast Seafood building foundations and infrastructure. Bulkhead failure could adversely impact continued operations of the facility and risk the safety of the workers at that facility and the customers using the marina. Such a failure would likely have adverse effects on the marine environment due to the potential for increased turbidity caused by slope failure and the potential for building

materials and other materials used at the Safe Coast Seafood facility entering the marine waters immediately after a catastrophic bulkhead failure.

The placement of the new bulkhead and associated drainage gravel backfill waterward of the remaining portion of the creosote treated timber bulkhead will provide a measure of protection from wave action and vessel wakes, slowing the deterioration of the old bulkhead structure and likely slowing the release of creosote from the timbers staying place. This decrease in creosote releases from the remaining bulkhead will likely improve habitat conditions over the long term by diminishing the episodic concentration of creosote leaching into the marine waters.

E. Compensatory Mitigation for the impact by replacing, enhancing, or providing substitute resources or environments.

The Port of Ilwaco proposes the following compensatory mitigation to offset the reduction in habitat function to the marine environment due to increase in overwater shading and loss of benthic habitat from the new bulkhead construction. The proposed compensatory mitigation consists of pile removal, removal of creosote from the marine environment, beach nourishment, removal of floating timber debris/overwater coverage from the marine environment. The proposed compensatory mitigation was identified during extensive consultation with federal and state agencies including additional coordination with WDFW to identify sufficient mitigation to address project impacts.

Approximately twenty-eight (28) creosote-treated timber piles (12-inch diameter) and three (3) steel piles (12-inch diameter) will be removed adjacent to the existing bulkhead and as part of the north shoreline rehabilitation. In addition, the Port proposes to remove approximately thirty-six (36) 12-inch diameter derelict creosote- treated timber piles and 3 creosote-treated timber pile caps as mitigation for the fill and benthic habitat impacts created by the placement of the new bulkhead wall in front of the existing structure. This will result in approximately 64 total creosote-treated timber piles and 3 steel piles being removed along with approximately 70 lf of creosote treated timber retaining wall, and 40 lf of creosote treated timber pile caps.

Approximately 1,200 sf of fill below the HTL will result from the placement of the new bulkhead and drainage rock backfill (Table 1). Of the overall footprint, 1,200 sf will come into contact with the bottom substrate and result in benthic habitat impacts.

North shoreline riprap placement will occur in a 2,200-sf area, 1,850 sf of which occurs below the HTL and would result in benthic habitat impacts (Table 1). Approximately 750 sf of this will occur waterward of the existing retaining wall. A 6-inch layer (approximately 34 cy) of fish mix gravel will be placed over the north shoreline riprap below HTL to provide beach nourishment and improved habitat for fish passing through the marina.

South shoreline riprap placement will not result in any additional benthic habitat impacts (Table 1) but will result in the removal of approximately 350 sf (14 cy) of concrete from the

environment to be replaced with riprap shore protection. The removal of approximately sixty-four (64) 12-inch creosote-treated timber piles, three (3) 12-inch steel piles, 70 lf of creosote-treated timber retaining wall, and 40 lf of derelict creosote-treated timber pile caps, will restore approximately 165 sf of benthic habitat (Table 1) and remove approximately34 tons of creosote from the marine environment.

Additionally, floating timber debris will be removed from the south portion of the marina as part of the project mitigation. This will remove approximately 2,510 sf of overwater coverage currently present in that portion of the marina (JARPA figure set, Sheet 9).

Table 1. Approximate Fill Impacts

Activity	Fill below HTL (sf)	Fill below HTL (cy)	Fill above HTL (sf)	Fill above HTL (cy)
Bulkhead wall and shoreline protection installation				
Sheetpile installation	400 sf	80 cy	0 sf	0 cy
Bulkhead drainage rock placement	1,000 sf	450 cy	0 sf	0 cy
Rip-rap shore protection and Fish Mix placement (north shoreline)	1,850 sf	172 cy	350 sf	26 cy
Concrete rubble removal (south shoreline)	-350 sf	-14 cy	-50 sf	-2 cy
Rip-rap replacement (south shoreline)	350 sf	30 cy	50 sf	5 cy
Subtotal	*3,250 sf*	*718 cy*	*350 sf*	*29 cy*
Structure removal				
Pile removal adjacent to existing bulkhead	-12 sf	-6 cy	0 sf	0 cy
North shoreline- retaining wall removal	-85 sf	-12 cy	0 sf	0 cy
Derelict pile/timber removal	-68 sf	-12 cy	0 sf	0 cy
Derelict Timber Structure Removal -South Marina	-2,510 sf	-350 cy	0 sf	0 cy
Subtotal	*-2,675 sf*	*-380 cy*	*0 sf*	*0 cy*
Creosote removal from the Environment	*34 tons*			

No Net Loss

The project will result in no net loss to habitat functions based on the baseline habitat conditions[1] that should be considered as "disturbed" at the project site and the avoidance, minimization, and mitigation measures that are included as part of the project and described in this memorandum. The project and associated mitigation will result in "equal or greater habitat functions….compared to existing conditions"[2,3] at the project site as water quality and benthic habitat will be improved through removal of creosote and concrete from the environment. The shoreline habitat will be improved from existing

[1] WAC 220-660-080 (4)(f) "For calculating compensatory mitigation requirements under this chapter, the environmental baseline is habitat conditions at the time the HPA application is submitted."

[2] WAC 220-660-080 (5)(d)

[3] Ilwaco SMP, 4.1.2 (1) "The existing ecological functions and ecosystem-wide processes of critical areas should be protected."

condition through placement of fish mix material over the project rip rap shoreline protection for beach nourishment and improved habitat for fish passing through the marina. The project will also provide protection to the timber bulkhead remaining in place, likely slowing deterioration from weathering, vessel wake, and wave action and decreasing the speed and concentration of the remaining creosote leaching into the marine waters. Additionally, the project mitigation will remove existing overwater coverage from the marina resulting in improved habitat for fish passing through the marina.

The proponent has avoided and minimized impacts to the marine environment to the greatest extent practicable through redesign, BMP implementation, and mitigation for permanent critical area impacts. Based on these measures, the project will not result in a net loss in critical area functions and values.

Attachments

- City of Ilwaco [SMP6.3(3)] pre-application meeting comment letter dated 2 May 2023
- WDFW Mitigation Consultation – Emails dated 14 June 2023
- Project JARPA & Permit Drawings
- Project Biological Evaluation (submitted to NOAA/NMFS 28 November 2022)