GRAYS HARBOR RAIL TERMINAL LLC
MITIGATION TECHNICAL REPORT

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1. Introduction

This technical report summarizes the impact analyses from intertidal, fisheries, and wetland technical reports for the Grays Harbor Rail Terminal Project (Project) and presents concepts for compensatory mitigation to address these impacts. The conceptual mitigation concepts have been developed to meet local ordinance requirements and to satisfy expected Clean Water Act permitting that will be administered at the state and federal levels. Detailed compensatory mitigation design documents will be developed during later design and permitting phases of the project.

2. Project Description

Grays Harbor Rail Terminal LLC (GHRT) is proposing a bulk liquids rail logistics facility at the Port of Grays Harbor Terminal 3 (T3) property. The facility will accommodate the receipt for export of not more than 45,000 barrels per day on average of various liquid bulk materials, specifically, various types of crude oil and condensates.

T3 is a 150 acre industrial site and includes an existing 600-foot- long concrete shipping terminal. The Port of Grays Harbor currently leases approximately 25 acres of the T3 site to a private tenant (Willis Enterprises), which utilizes the property for storing and sorting logs, and operating a wood chipping and processing facility. The tenant utilizes the existing wharf for product loading on to barges for export. The remaining area of the property (a former mill site) is occupied by 4 metal buildings and a rail spur line but is otherwise currently vacant.

The liquid bulk materials would be delivered to the proposed facility via unit trains in fully contained liquid bulk rail cars, unloaded into on-site storage tanks, and then loaded onto barges or other marine vessels for delivery to refineries.

The general layout of the proposed rail and off-loading facilities includes four 20-car yard tracks and two 20-car off-loading tracks (120 rail cars total). In addition, a “run-around” track would be used to reposition the locomotive engines and could also be used to hold cars awaiting maintenance. The off-loading spots would be equipped with permanent rack access structures where each rack structure would support connections for a maximum of 40 rail cars (20 spots on each side of a rack). The off-loading spots and central header would be located within secondary containment. The rack structures consist of elevated steel walkways with extendable access platforms used to access the tops of the rail cars. Off-loading would occur via 4-inch dry break connections, hoses, valves, and risers connecting the bottom rail car couplers to a central piping header. The rail cars would be off-loaded by gravity feed into the central header.

The liquid bulk materials would be stored in approximately six to eight above-ground storage tanks with secondary containment and internal floating roofs until a marine vessel (ship or barge) arrives. All tanks will be located outside the Shoreline District. The total combined tank storage would be approximately 800,000 – 1,000,000 barrels. Construction of multiple storage

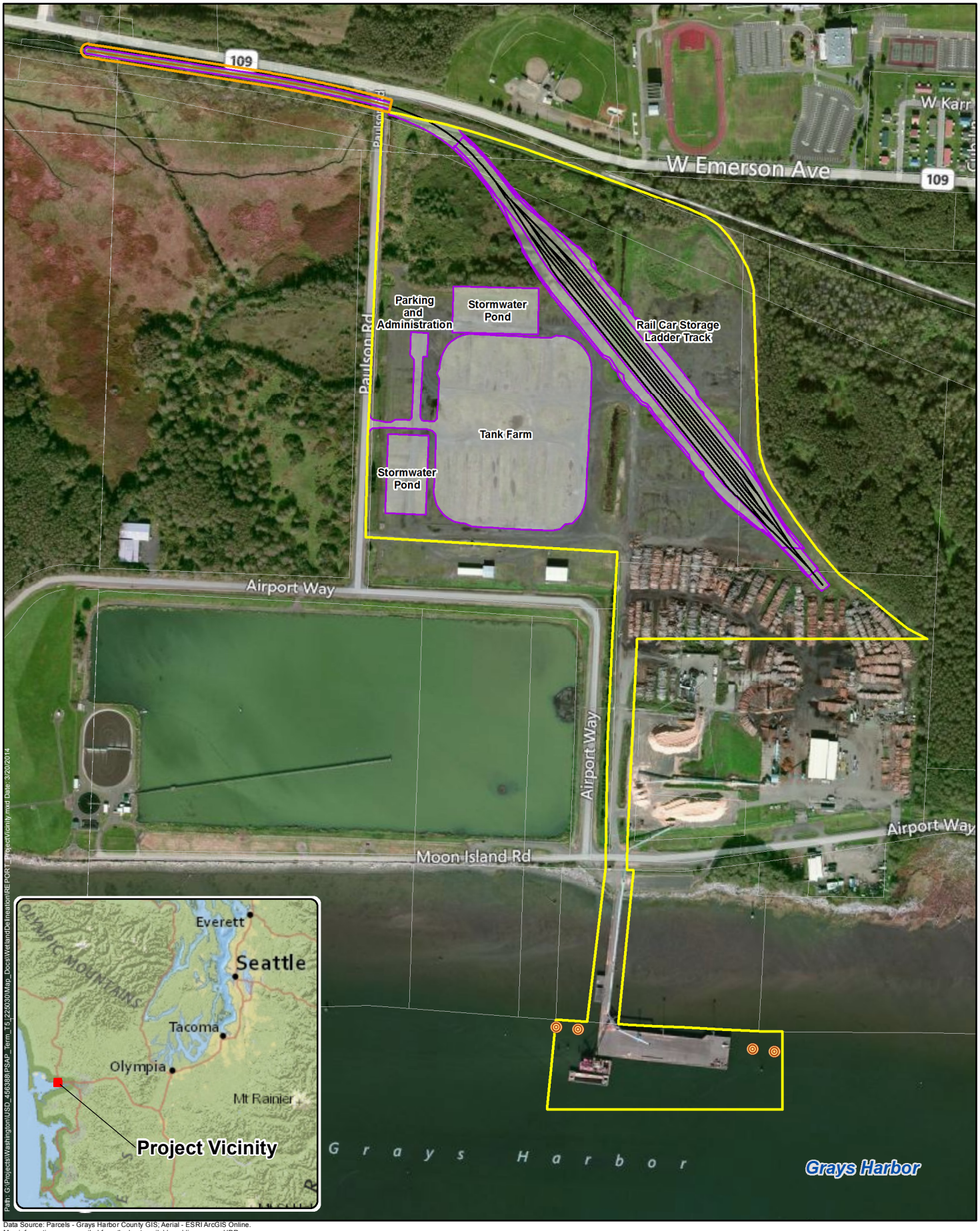
tanks would allow the facility to accommodate interruptions in vessel schedules as well as changes in delivery volumes, and would allow the facility to maintain consistent operations. Vessel calls are anticipated by barge and Panamax vessels occurring approximately 3-4 times per month.

As noted above, T3 includes an existing 600-foot-long concrete shipping terminal. There are currently four mooring dolphins (three downstream/one upstream) off the existing concrete wharf. Up to four additional mooring dolphins (two downstream and two upstream) would be constructed to minimize vessel movements during liquid bulk materials transfer. No additional overwater expansion of the wharf is proposed. The existing trestle (supporting the Willis conveyor) and the wharf can accommodate the liquid bulk materials pipe rack needed to transfer the materials from the tanks to the vessels. Stormwater collection, drainage improvements, and spill containment measures would be added to the existing wharf but no structural modifications are necessary.

To facilitate operations at the Grays Harbor Rail Terminal, the Puget Sound and Pacific Railroad would be permitting and supervising construction of an industrial lead track extension of their main line railroad system. This industrial lead track would extend from the current main line rail terminus, just east of Paulson Road, for approximately 1,300 lineal feet to the west. The industrial lead track would allow for the backing of rail cars strings into the project site and provide additional rail car storage for other Port tenants. The identification of the industrial lead track is to account for potential indirect or cumulative environmental impacts for the purposes of the State Environmental Policy Act (SEPA) only and is not a project component of the Grays Harbor Rail Terminal site development permitting.

3. Intertidal Habitat

The intertidal zone in the vicinity of the Project includes an open-water shoreline, and a salt marsh/ surge plain with a tidal channel (HDR 2014a). The open-water shoreline is associated with the terminal (Figure 1), and is a gradual sloped sand and mud flat. The salt marsh and surge plain intertidal zone is adjacent to the mainline track, and is the eastern end of the Bowerman Basin.



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Data Source: Parcels - Grays Harbor County GIS; Aerial - ESRI ArcGIS Online.
Map information was compiled from the best available public sources. HDR does not warrant that the information is accurate or complete.

New Mooring Dolphins
Project Railroad Track
Industrial Lead Railroad Track
Parcel
Detention/Infill Pond, Tank Farm, Rail Car Unloading Tracks
Project Area
Industrial Lead Track

0 125 250 500 Feet

Figure 1 Project Vicinity Map
Grays Harbor Rail Terminal

Terminal 3 – Port of Grays Harbor, Hoquiam WA
US Development Group LLC

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3.1 Intertidal Zone Impacts

Potential project impacts to intertidal open-water shoreline habitat will result from the installation of 4 new mooring dolphins (Figure 2). Each dolphin will be comprised of 8 24-inch diameter steel piles. This will result in the displacement of approximately 25.1 square feet of intertidal open-water shoreline habitat per dolphin, or a total impact area of approximately 100.5 square feet for the 4 new dolphins. This action will eliminate benthic invertebrate production habitat in these areas. Increased vessel traffic may increase wave action along the beach which may increase erosion along the shoreline. However, waves from the vessels used for this project are not expected impact the project area shoreline because they will be moving very slowly as they move into the terminal berth. Wave impacts at the project site are also not anticipated because the existing upper intertidal zone is already armored with riprap, making the shoreline very resistant to wave action. Prop wash from tugboats may be of concern, as they move the tankers in and out of the terminal berth, but these actions would occur within the dredged navigation channel that is maintained by the U.S. Army Corps of Engineers.

There are no direct impacts to the high marsh or tidal channel habitat west of Paulson Road in the Grays Harbor National Wildlife Refuge. All of the project actions will take place east of Paulson Road. The intertidal surge plain extends onto the project site near the northwest corner of the site in the form of an intertidal channel. This ditch connects to the intertidal areas to the west via a culvert under Paulson Road near the intersection with State Route 109. Approximately 0.08 acre of intertidal salt marsh/ surge plain that contains a tidal channel will be filled for the new facility. These impacts and proposed mitigation are discussed in connection with fish habitat (Section 4) and wetlands (Section 5).

3.2 Intertidal Zone Mitigation

The additional mooring dolphins have a relatively modest footprint, but the reduction in benthic habitat function in these areas may require compensatory mitigation. Derelict piles have a similar impact to the intertidal zone as the dolphins, in terms of reducing benthic productivity. However, most derelict piles also have resulted in a local toxic impact, because most were treated with creosote or other preservatives before they were originally installed. Derelict piles are widespread in Grays Harbor, and there are many near the Project Area. Removal of a select number of derelict piles would be a reasonable option to off-set impacts associated with the new dolphins. Derelict pile removal could be accomplished from a barge and using a vibratory hammer. The selection of derelict piles for removal should be prioritized based on the following criteria:

- Near Project Area
- Similar tidal elevation to the proposed impact areas
- Substantial length; visible during high tide

The number of derelict piles to be removed could be based on a 1:1 offset of benthic area. That is, since the dolphins will result in 100.5 square feet of benthic impact, 100.5 square feet of derelict pile removal would be an appropriate target for compensatory mitigation. Removal should occur before dolphin installation, in order to avoid a lag in net habitat benefits.

Figure 2
Proposed Intertidal Habitat Impacts and Mitigation

Project Area

Intertidal Impact Area (New Mooring Dolphins)

0 50 100 200 Feet

Terminal 3
Port of Grays Harbor
Hoquiam Washington
US Development Group LLC

HDR

Data Source: Parcels - Grays Harbor County GIS; Aerial - ESRI ArcGIS Online. Map information was compiled from the best available public sources. HDR does not warrant that the information is accurate or complete.

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4. Fish Habitat

Estuarine environments are extremely productive, rich habitats, and tidal channels and sloughs provide habitat for juvenile salmon rearing and migrating through the estuary. The surface water channel along the north edge of the project property flows through a culvert passing under Paulson Road where it continues westward through the Grays Harbor National Wildlife Refuge to empty into Grays Harbor (Figure 3). The wetted channel is typically around 6-10 feet wide and 2 to 3 feet in depth at the western end and gradually becomes narrower and more shallow towards the east end. This channel provides marginal fish habitat and is used by rearing coho and chum salmon and is occupied by three-spine stickleback (HDR 2014b).

4.1 Fish Habitat Impacts

Approximately 0.08 acres of intertidal salt marsh/ surge plain habitat and an associated 340 lineal feet of tidal channel will be impacted east of Paulson Road (Figure 3). In addition to filling a portion of the tidally-influenced channel, the project could alter the drainage patterns of the site and result in downstream scour or habitat changes. Redevelopment of this site would have positive impacts as well because a series of storm water retention ponds and treatments systems would be built where none exist today. These would likely result in improved water quality for the runoff that does occur and influence the downstream receiving waters.

Improved water quality treatment at the site and specifically discharging to the north drainage channel and downstream into the Grays Harbor National Wildlife Refuge would result in less turbid runoff. Under the present conditions runoff of bare soil areas flows unimpeded to the tidal channels affecting the downstream areas. Improved water quality by controlling runoff from the site would prove beneficial for fish habitat and the wildlife refuge by preventing excessive turbidity and harmful substances from entering the waters used by fish.

The mainline extension west of Paulson Road would not have any permanent impacts on fish or fish habitat since the footprint of the rail line would be outside the tidal channel areas used by fish in the Bowerman Wildlife Refuge.

Completion and operation of the project would result in a slight increase in vessel traffic of 3 to 4 more ships per month at the terminal. This could affect fish use of the navigation channel at and downstream of the Terminal with added disturbance. The frequency of these added ships is quite small, so the disturbance would be intermittent and minimal. The mooring dolphins at T3 have a very small habitat impact, and is immeasurable compared to the overall acreage of essential fish habitat (EFH) in Grays Harbor. No permanent adverse effects on EFH for ground fishes, coastal pelagics, Pacific salmonids, or their prey species would result from the proposed installation of additional mooring dolphins at the project site. Added overwater structure from the new dolphins could provide additional perching areas for piscivorous birds resulting in a small increase in predation opportunities.

4.2 Fish Habitat Mitigation

The project proposes to mitigate for the loss of fish habitat by rerouting, lengthening, and improving habitat conditions in the tidal channel (Figure 4). Water quality in the tidal channel will be improved from the implementation of the Project storm water drainage plan. The newly constructed channel will have habitat features such as LWD, pool-forming structures, and native riparian vegetation to increase suitability for use by rearing juvenile salmonids. Existing channel conditions have very little habitat structure, such as pools and fish cover. Therefore, the proposed channel and habitat features are expected to support a higher density of rearing salmonids. The approximate layout shown in Figure 4 provides 990 feet of new channel. Bends, scour pools, and the addition of LWD structure would improve cover and habitat for juvenile salmon using the channel for rearing and refuge during their residence time in the estuary. Additional discussion related to the tidal channel is presented within the wetlands section.

Data Source: Wetland resource features - HDR ; Aerial - ESRI ArcGIS Online.
Map information was compiled from the best available public sources. HDR does not warrant that the information is accurate or complete.

New Mooring Dolphin
Culvert
MHHW
Project Area
Industrial Lead Track
Detention/Infill Pond, Tank Farm, Rail Car Unloading Tracks
Wetland within the project area
Approximate wetland boundary
Wetlands Impact Area

0 100 200 400 Feet

Figure 3
Wetland and Stream Impact Areas

Terminal 3 – Port of Grays Harbor, Hoquiam WA
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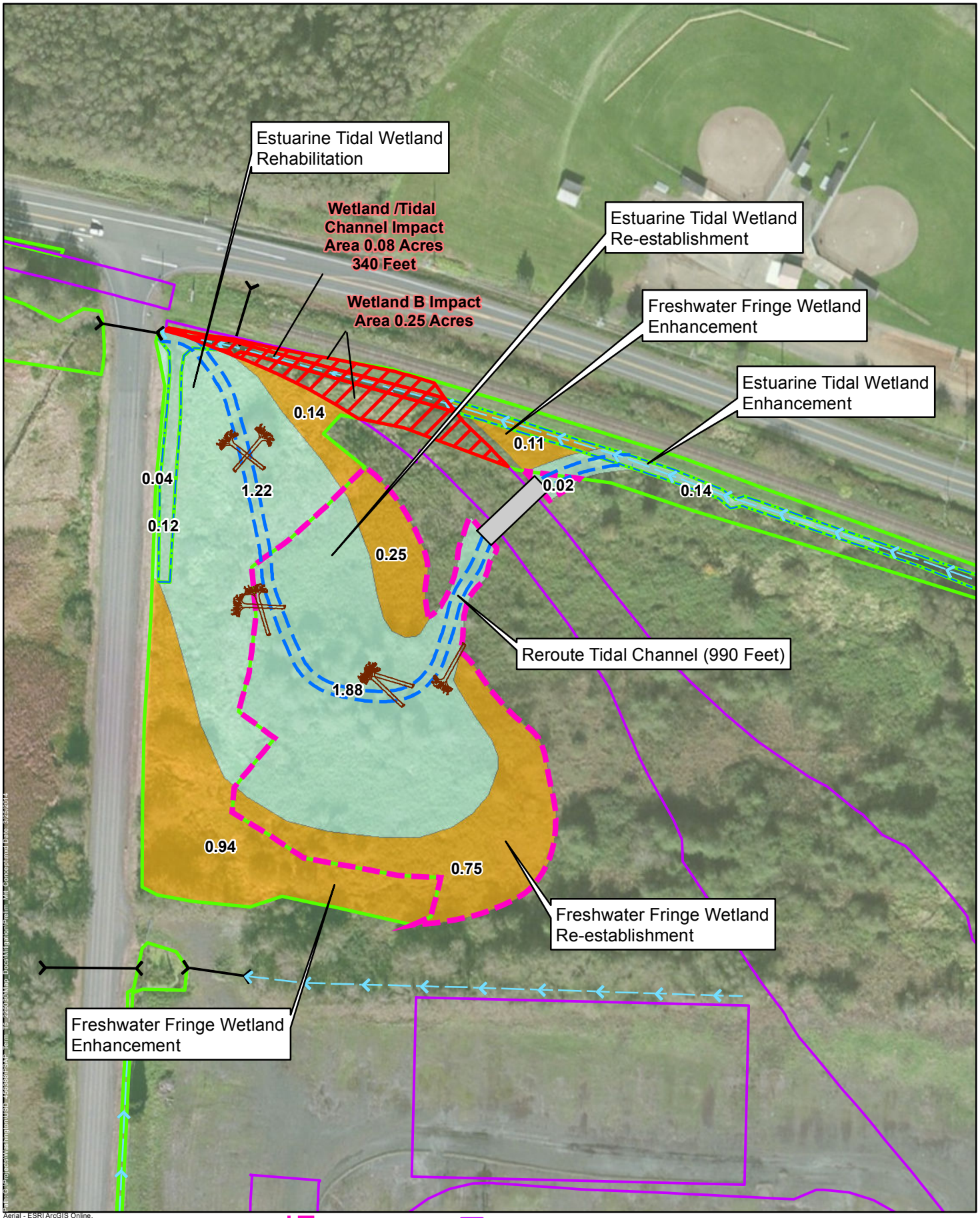

Aerial - ESRI ArcGIS Online.
Map information was compiled from the best available public sources. HDR does not warrant that the information is accurate or complete.

Wetland Re-establishment Area
Wetland Impact Area
Estuarine Tidal Wetland
Freshwater Fringe Wetland
Existing Wetland Boundary
New Culvert
Construction Footprint
Impacted Wetlands
New Stream Alignment
Existing Tidal Wetland Boundary
Culvert
Flow
Large Woody Debris

HDR

N

0 50 100 Feet

Figure 4
On-site Mitigation Concept
Grays Harbor Rail Terminal

Terminal 3 – Port of Grays Harbor, Hoquiam WA
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5. Wetlands

5.1 Wetland Impacts

The Grays Harbor Rail Terminal Project would result in the permanent loss of 0.52 acres of the 5.94 acres of wetlands mapped within the study area (approximately nine percent). All wetland impacts would be anticipated to occur during the construction phase of the project. No impacts to wetlands are anticipated during the Operations phase of the project. Table 1 below summarizes the acreage of permanent impacts to wetlands by project components. A plan view of the project components overlain on the wetland mapping is shown in Figure 3.

Table 1. Summary of Permanent Impacts to Wetlands in the Study Area

Project Component	Type of Impact	Wetland Name	Cowardin Class	Wetland Rating [a]	Permanent Impact (acres)
Rail Terminal	Fill	Wetland B	PEM1	Category III	0.06
Rail Terminal	Fill/Culvert	Wetland B	PEM1	Category III	0.37
Rail Terminal	Fill	Wetland M	E2EM1N	Category II	0.08
Tank Farm	Fill/Culvert	Wetland I	PEM1	Category IV	0.01
Total:					**0.52**

[a] Wetland ratings are based Washington State Wetland Rating System for Western Washington – Revised (Hruby 2004).

The bulk of the impacts will occur to Wetland B (0.43 acres) and Wetland M (0.08 acre) from the construction of the new rail yard servicing the liquid storage facility. The remaining 0.01 acres of impact would occur to Wetland I which is a roadside drainage ditch dominated by non-native and invasive species. Temporary impacts from construction have not been identified at this time but are anticipated to be minor. Much of the study area has been previously filled and existing areas of undisturbed native vegetation are minimal. Construction would occur during the dry summer months. Temporary erosion and sediment control measures will be implemented as practicable at individual locations to minimize short-term water quality impacts to wetlands. Disturbed areas will be replanted with vegetation appropriate to the site's hydrology, salinity, and habitat type following construction. All construction limits would be marked in the field and appropriate best management practices would be followed to prevent unpermitted impacts to wetlands. Wetland areas to be avoided during construction would be marked with orange construction fencing.

An above ground pipeline would be constructed from the tank farm to the shipping terminal to transport crude from the on-shore storage tanks to the shipping vessels. Construction access for the pipeline would be via an existing road that provides access from Airport Way into the log storage and wood chipping facility. Two wetlands, Wetlands K and L, are located on the east side of the access road leading to the log storage and wood chipping facility. No permanent or temporary impacts to these wetlands are planned at this time.

5.2 Wetland Mitigation

The affected wetlands in the study area are rated Category II (Estuarine), Category III, and Category IV, and the applicable mitigation ratios are shown in Table 2 below. These ratios are typical mitigation ratios provided in the Wetland Mitigation in Washington State Part 1: Agency Policies and Guidance (Ecology et al. 2006) and are part of the requirements of the City of Hoquiam under their Critical Areas Ordinance.

Table 2. City of Hoquiam Wetland Mitigation Ratios for Category II, Category III, and IV Wetlands in Project Area

Category and Type of Wetland Impacts	Re-establishment or Creation	Rehabilitation Only	Re-establishment or Creation (R/C) and Rehabilitation (RH)	Re-establishment or Creation (R/C) and Enhancement (E)	Enhancement Only
Category IV	1.5:1	3:1	1:1 R/C and 1:1 RH	1:1 R/C and 2:1 E	6:1
Category III	2:1	4:1	1:1 R/C and 2:1 RH	1:1 R/C and 4:1 E	8:1
Category II Estuarine	Case-by-case	4:1 Rehabilitation of an estuarine wetland	Case-by-case	Case-by-case	Case-by-case

Sources:
Ecology et al. 2006
Hoquiam Municipal Code (HMC 11.06.170)

Applying these typical mitigation ratios will require more than 0.88 acre of wetland re-establishment or creation, 2.07 acres of wetland rehabilitation, or more than 3.5 acres of wetland enhancement if only one type of mitigation were proposed (Table 3).

Table 3. Mitigation Acreage Needs for Permanent Impacts

Wetland Category	Impact Area (in acres)	Re-establishment or Creation (in acres)	Rehabilitation Only (in acres)	Re-establishment or Creation (R/C) and Rehabilitation (RH) (in acres)	Re-establishment or Creation (R/C) and Enhancement (E) (in acres)	Enhancement Only (in acres)
Category IV	0.01	0.015	0.03	0.01 R/C and 0.01 RH	0.01 R/C and 0.02 E	0.06
Category III	0.43	0.86	1.72	0.43 R/C and 0.86 RH	0.43 R/C and 1.72 E	3.44
Category II Estuarine	0.08	Case-by-case	0.32	Case-by-case	Case-by-case	Case-by-case
Total Area	**0.52**	**0.88 and additional areas for estuarine wetland**	**2.07**	**0.44 R/C and 0.87 RH and additional areas for estuarine wetlands**	**0.44 R/C and 1.74E and additional areas for estuarine wetland**	**3.5 and additional areas for estuarine wetlands**

The mitigation proposed for this project will reestablish, rehabilitate, and enhance and rehabilitate the existing degraded wetlands on-site and within the project area (Figure 4). Wetland B and M would provide on-site and in-kind mitigation (Table 4).

Table 4. Proposed Wetland Mitigation

Proposed Mitigation Site	Proposed Mitigation Activities	Total Area (acres)
Wetland B	Re-establishment	2.91
	Rehabilitation	1.26
	Enhancement	1.19
Total Area for Wetland B		**5.36**
Wetland M	Enhancement	0.27
Total Area for Wetland M		**0.27**
Total Mitigation Area		**5.63**

The proposed mitigation meets or exceeds City of Hoquiam mitigation standards and will improve habitat conditions over the existing conditions.

6. Conclusion

The project will affect approximately 0.52 acres of lower quality wetland and result in more wetland acreage and the wetlands present will provide better support to fish and wildlife species. In addition, the improved water quality treatment system will alleviate ongoing exposed soil erosion and turbid runoff conditions that affect the national wildlife refuge. Lengthening and enhancing the tidal channel will increase rearing opportunities for salmonid species.

7. References

HDR. 2014a. Intertidal Technical Report, Grays Harbor Rail Terminal Project.

HDR. 2014b. Fish Habitat Technical Report, Grays Harbor Rail Terminal Project.