WASHINGTON STATE
Joint Aquatic Resources Permit Application (JARPA) Form[1,2]

USE BLACK OR BLUE INK TO ENTER ANSWERS IN THE WHITE SPACES BELOW.

US Army Corps of Engineers ®
Seattle District

AGENCY USE ONLY

Date received: Received August 31, 2015

Agency reference #: _____

Tax Parcel #(s): _____

Part 1–Project Identification

1. Project Name (A name for your project that you create. Examples: Smith's Dock or Seabrook Lane Development) [help]
Kalama Manufacturing and Marine Export Facility

Part 2–Applicant

The person and/or organization responsible for the project. [help]

2a. Name (Last, First, Middle)			
Reeder, Tabitha			
2b. Organization (If applicable)			
Port of Kalama			
2c. Mailing Address (Street or PO Box)			
110 West Marine Drive			
2d. City, State, Zip			
Kalama, Washington 98625			
2e. Phone (1)	**2f.** Phone (2)	**2g.** Fax	**2h.** E-mail

[1]Additional forms may be required for the following permits:

- If your project may qualify for Department of the Army authorization through a Regional General Permit (RGP), contact the U.S. Army Corps of Engineers for application information (206) 764-3495.
- If your project might affect species listed under the Endangered Species Act, you will need to fill out a Specific Project Information Form (SPIF) or prepare a Biological Evaluation. Forms can be found at http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory/PermitGuidebook/EndangeredSpecies.aspx.
- Not all cities and counties accept the JARPA for their local Shoreline permits. If you need a Shoreline permit, contact the appropriate city or county government to make sure they accept the JARPA.

[2]To access an online JARPA form with [help] screens, go to http://www.epermitting.wa.gov/site/alias__resourcecenter/jarpa_jarpa_form/9984/jarpa_form.aspx.

For other help, contact the Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043 or help@ora.wa.gov.

(360) 673-2325	( )	(360) 673-5017	treeder@portofkalama.com

Part 3–Authorized Agent or Contact

Person authorized to represent the applicant about the project. (Note: Authorized agent(s) must sign 11b of this application.) [help]

3a. Name (Last, First, Middle)			
Gunderson, Dan			
3b. Organization (If applicable)			
BergerABAM			
3c. Mailing Address (Street or PO Box)			
210 East 13th Street, Suite 300			
3d. City, State, Zip			
Vancouver, WA 98660			
3e. Phone (1)	**3f.** Phone (2)	**3g.** Fax	**3h.** E-mail
(360) 823-6100	(360) 823-6110	(360) 823-6101	dan.gunderson@abam.com

Part 4–Property Owner(s)

Contact information for people or organizations owning the property(ies) where the project will occur. Consider both **upland and aquatic** ownership because the upland owners may not own the adjacent aquatic land. [help]

☒ Same as applicant. (Skip to Part 5.)

☐ Repair or maintenance activities on existing rights-of-way or easements. (Skip to Part 5.)

☐ There are multiple upland property owners. Complete the section below and fill out JARPA Attachment A for each additional property owner.

☐ Your project is on Department of Natural Resources (DNR)-managed aquatic lands. If you don't know, contact the DNR at (360) 902-1100 to determine aquatic land ownership. If yes, complete JARPA Attachment E to apply for the Aquatic Use Authorization.

4a. Name (Last, First, Middle)			
4b. Organization (If applicable)			
4c. Mailing Address (Street or PO Box)			
4d. City, State, Zip			
4e. Phone (1)	**4f.** Phone (2)	**4g.** Fax	**4h.** E-mail
( )	( )	( )	

Part 5–Project Location(s)

Identifying information about the property or properties where the project will occur. [help]

☐ There are multiple project locations (e.g., linear projects). Complete the section below and use JARPA Attachment B for each additional project location.

5a. Indicate the type of ownership of the property. (Check all that apply.) [help]

☐ Private
☒ Publicly owned (state, county, city, special districts like schools, ports, etc.)
☐ Federal
☐ Tribal
☐ Department of Natural Resources (DNR)-managed aquatic lands (Complete JARPA Attachment E)

The Port of Kalama has a port management agreement (PMA #20-80002) with DNR for the aquatic lands on which the project will occur.

5b. Street Address (Cannot be a PO Box. If there is no address, provide other location information in 5p.) [help]

Terminus of Tradewinds Road, Kalama, WA (Figure 1; all figures included as Appendix A)

5c. City, State, Zip (If the project is not in a city or town, provide the name of the nearest city or town.) [help]

Kalama, WA 98625

5d. County [help]

Cowlitz County

5e. Provide the section, township, and range for the project location. [help]

¼ Section	Section	Township	Range
NE & SE SE	36 25	07 North	02 West
NW & SW	31	07 North	01 West

\5f. Provide the latitude and longitude of the project location. [help]

- Example: 47.03922 N lat. / -122.89142 W long. (Use decimal degrees - NAD 83)

46.043235 N lat. / -122.87678 W. long

5g. List the tax parcel number(s) for the project location. [help]

- The local county assessor's office can provide this information.

The project site consists of portions of tax parcels 63302, 63304, 63305, 60822, 60831, 63301, and WH2516001.

5h. Contact information for all adjoining property owners. (If you need more space, use JARPA Attachment C.) [help]

Name	Mailing Address	Tax Parcel # (if known)
Port of Kalama	110 West Marine Drive Kalama, WA 98625	60832, 60824, 6330104
DNR	PO Box 47000 1111 Washington Street SE Olympia, WA 98504-7000	N/A (Columbia River)
BNSF Railway	3930 Northwest Yeon Avenue Portland, OR 97210	N/A (rail line and associated right of way)

Washington Department of Fish and Wildlife (WDFW)	1111 Washington St SE, Olympia, WA 98501	WD3012003, WH2516001

5i. List all wetlands on or adjacent to the project location. [help]

There are no wetlands on the proposed project site. The Port of Kalama (Port) prepared a wetland delineation for the project site and its vicinity in December 2014 (Ecological Land Services 2014). The delineation identified two wetlands in the vicinity of the project site (described below), but neither wetland extends onto the project site. The wetland delineation is included as Appendix B.

Wetland A (see Appendix B) is a riverine backwater channel of the Columbia River adjacent to the project site. Wetland A is over 100 acres in size and is within a freshwater tidal flat of the Columbia River. Hydrology in this wetland stems primarily from daily tidal fluctuations and seasonal high water in the Columbia River. Vegetation is dominated primarily by native trees and shrubs with many native emergent species and reed canarygrass in the understory. The 2014 wetland delineation identified Wetland A as a Category II wetland, according to the Washington State Wetland Rating System.

Wetland B is located to the east of the project site, within a ditch east of Tradewinds Road and west of a steep railroad grade. This wetland is constrained between the fill slopes for the road and the railroad grade. Hydrology in Wetland B is mainly from rainfall, runoff, and a seasonally high groundwater table. The 2014 wetland delineation identified Wetland B as a Category III wetland, according to the Washington State Wetland Rating System.

5j. List all waterbodies (other than wetlands) on or adjacent to the project location. [help]

The project site includes areas in and adjacent to the Columbia River, at approximately River Mile (RM) 72.

5k. Is any part of the project area within a 100-year floodplain? [help]

☒ Yes ☐ No ☐ Don't know

5l. Briefly describe the vegetation and habitat conditions on the property. [help]

Terrestrial Habitats

The terrestrial portion of the project will be constructed on a heavily disturbed upland area that has been slated for industrial development for years. Terrestrial habitat within the upland portion of the site consists almost entirely of dredged sands in either an unvegetated state, or in various stages of revegetation.

At the eastern portion of the site, there is an area of herbaceous vegetation where groundcover is approximately 95-100%, with a mix of mosses, grasses, and forbs and scattered Scotch broom (*Cytisus scoparius*). There are no areas of bare sand in this portion of the site, and herbaceous vegetation is dense. This portion of the site may provide some marginal foraging opportunities for avian or small mammal species.

The south central portion of the site consists of dredged material (sand) that is under active Port use and management. Because the sand in this area is maintained as structural fill and moved frequently, it is essentially devoid of vegetation at all times of the year. This portion of the site provides very little habitat function for any terrestrial or avian species.

The southwest section of the site is only slightly more diverse in structure. Vegetated areas here are dense with mosses, grasses, and herbaceous vegetation, and there are several roads and parking areas in this portion of the site. A few small and isolated areas could possess soil and vegetation conditions that could provide marginal foraging opportunities for avian or small mammal species, but habitat suitability is limited in this portion of the site.

The northwestern portion of the site is located on an area of dredged material that was placed as part of the US Army Corps of Engineers (USACE) Columbia River Navigation Channel project. Deposition of dredged

material began at this portion of the site in approximately 1978, with the most recent placement occurring in 2008 (US Army Corps of Engineers 2014). Most of this portion of the site is sparsely vegetated with low-growing herbaceous vegetation and a mix of perennial and annual grasses. This portion of the site also includes areas that are relatively densely vegetated with low-growing vegetation and/or Scotch broom, and other areas that are largely unvegetated. This portion of the site is unfenced, and can be accessed by the public as well as by terrestrial and avian wildlife species. This portion of the site likely provides potentially suitable habitat for terrestrial mammals accustomed to industrialized and populated environments such as coyotes, rabbits, and small rodents. Parts of this northern portion of the site also provide suitable habitat for a number of avian species.

Common plant species on the vegetated portions of the site include a mix of annual grasses (annual bluegrass [*Poa annua*] and annual bromes [*Bromus* spp.]), perennial grasses (colonial bentgrass [*Agrostis capillaris*], velvetgrass [*Holcus lanatus*], and red fescue [*Festuca rubra*]), and weedy herbaceous species (rabbit's foot clover [*Trifolium arvense*], common mullein [*Verbascum thapsis*], Queen Anne's lace [*Daucus carota*], hairy cat's ear [*Hypochaeris radicata*], ox-eye daisy [*Leucanthemum vulgare*], Canada thistle [*Cirsium arvense*], bull thistle [*Cirsium vulgare*], St. John's-wort [*Hypericum perforatum*], chickweed (*Stellaria media*), yellow glandweed [*Parentucellia viscosa*], sheep sorrel [*Rumex acetosella*], and narrowleaf plantain [*Plantago lanceolata*]). Mosses also represent a significant portion of the ground cover across the site, especially in portions of the site that have not been recently disturbed.

Of the few woody species present on the site, Scotch broom is the most common. A narrow band of black cottonwood (*Populus balsamifera*) trees and saplings has established in the riparian area between the portion of the site that will be developed and the ordinary high water mark (OHWM). Black cottonwood and various willow species (*Salix* spp.) are also present in the portion of the project site where the proposed recreational access improvements will be conducted at the north end of the site. These trees are primarily small saplings between 1 and 8 inches diameter at breast height (dbh), but there are a few larger diameter trees between approximately 8 and 20 inches dbh. Many of these trees are multi-stemmed. A few small black cottonwood saplings have also begun to establish on the upland portions of the site.

Eight species previously documented on various portions of the site are identified as noxious weeds by the Washington State Noxious Weed Control Board: Scotch broom, Queen Anne's lace, hairy cat's ear, ox-eye daisy, Canada thistle, bull thistle, St. John's-wort, common groundsel (*Senecio vulgaris*), and reed canarygrass (*Phalaris arundinacea*).

Aquatic Habitats

The aquatic portion of the project will be conducted within a freshwater fluvial section of the Columbia River at RM 72 and approximately 1 RM downstream from the mouth of the Kalama River. This reach of the river is used by several populations of anadromous salmonids, steelhead, and bull trout as a migratory route between upstream spawning areas and the Pacific Ocean.

While this reach of the river is located upstream of the furthest extent of saltwater intrusion, it is within a tidally influenced portion of the river. Tidally induced changes in water level on the Columbia River are observed as far upstream as Bonneville Dam (RM 146) during low river flow. River flow reversals are not observed in this reach of the river, however, and the site is upstream of the upstream extent of saltwater intrusion. Reversal of river flow has been measured only as far upstream as Oak Point (RM 53), and the intrusion of saltwater generally does not extend further than 23 miles inland (near Harrington Point) at the minimum regulated monthly flow. When lower daily flows occur, salt intrusion can extend past Pillar Rock (approximately RM 28) (Lower Columbia Fish Recovery Board 2010).

Aquatic habitats within the Columbia River at the project site include intertidal sandy beaches, subtidal demersal (river bottom) habitat, and water column habitat. There is a shallowly sloping beach below the OHWM at the site, which extends out from the shoreline a distance of approximately 250 feet. Average water depths in this shallow area likely average between 5 and 15 feet of water. Beyond this distance the shoreline drops off rapidly to water depths in excess of 35 feet. Substrate within both subtidal and intertidal benthic environments consists largely of silts and medium-to-coarse alluvial sands. Channel substrate throughout the Lower Columbia River is very similar and consists primarily of sand with some silt, especially in nearshore

shallow water areas. There is no submerged aquatic vegetation in this reach of the river, most likely due to the dynamic nature of the system and the high water velocities. In general, the aquatic habitat of the Columbia River at the site provides habitat for a variety of benthic, epibenthic, and water column organisms. The shape, composition, and configuration of benthic topography are in a state of relatively constant change in this reach of the Columbia River, due to natural processes. Sand waves naturally form and propagate along the channel and the adjacent river bottom, with the estimated volume of sand in a single large sand wave in a range of between 100,000-200,000 cubic yards (Coast and Harbor 2015). The benthic surface of the river bottom in this location is subject to near-continual disturbance from the turbulent high-energy conditions that are the normal condition in this reach of the river.

The backwater habitat north and west of the project site provides relatively higher functioning aquatic habitat, particularly as a backwater refugia for juvenile salmonids. Small fish, amphibians, and a variety of invertebrates are all likely to be present in this portion of the site vicinity. In addition, the riparian vegetation bordering this backwater channel provides terrestrial invertebrate, large woody debris, and leaf litter inputs.

5m. Describe how the property is currently used. [help]

The south central portion of the project site consists of dredged material (sand) that is under active Port use and management.

The northern portion of the project site is located on an area of dredged material that was until recently part of the dredged material placement network for the USACE Columbia River Navigation Channel project. Deposition of dredged material began here in approximately 1978, with the most recent placement occurring in 2008 (US Army Corps of Engineers 2014). The site was withdrawn from the network of USACE dredge material placements sites in February 2015.

The shoreline and the dredged material pile in the northern portion of the site are accessible to the public by permit issued by the Port. The shoreline is used for informal recreational purposes such as walking and fishing. An access roadway runs along the northern boundary of the project site and provides informal public access to the shoreline at the northern tip of the project site.

The Port received authorization to construct a 1,000-foot-long extension of the existing North Port dock in 2005 (USACE Permit No. 199600782), including two access trestles, cargo staging area, and parking. The Port renewed this permit in 2009, but the project was not constructed

5n. Describe how the adjacent properties are currently used. [help]

The project site is bounded on the west by the Columbia River and to the east by Tradewinds Road, the Air Liquide industrial facility, and the Port's wastewater treatment plant; to the north, the site is bounded by Port property primarily used for open space, recreation, and mitigation, and to the south, by the existing Steelscape manufacturing facility.

5o. Describe the structures (above and below ground) on the property, including their purpose(s) and current condition. [help]

An existing warehouse building is present in the southwestern portion of the project site. Other existing aboveground features include fencing, paved laydown adjacent to the shore, gravel roadway improvements, a weir used for dredging and dewatering, and dredged materials. Below ground features include an infiltration trench and three established back up water wells based on the port's water rights certification.

5p. Provide driving directions from the closest highway to the project location, and attach a map. [help]

From Interstate 5, take Exit 32 for Kalama River Road. Head west on West Kalama River Road for approximately 0.4 mile and turn right onto Tradewinds Road. Follow Tradewinds Road north and then west for approximately 0.7 mile to an informal parking area near the northern portion of the project site.

Part 6–Project Description

6a. Briefly summarize the overall project. You can provide more detail in 6b. [help]

Northwest Innovation Works LLC (NWIW) and the Port propose to design and construct the Kalama Manufacturing and Marine Export Facility (the project) to manufacture and export methanol on approximately 100 acres on the Columbia River at the Port's North Port site (the proposed project). The proposed project will consist of a methanol production facility in upland areas; accessory administrative, support, and infrastructure facilities located in upland areas; and a new marine terminal located on the Columbia River. The marine terminal will include the construction of a new dock that will require work (pile driving and dredging) below the OHWM of the Columbia River (defined by the USACE at 11.6 feet Columbia River Datum [CRD] at RM 72).

The proposed project is designed to produce up to 10,000 metric tonnes per day of AA-grade methanol from natural gas. The proposed manufacturing facility would have two production lines, each with a production capacity of 5,000 metric tonnes per day.. The project site and infrastructure will be developed initially to accommodate both production lines. The anticipated yearly production at full capacity is approximately 3.6 million metric tonnes of methanol. The methanol will be stored in non-pressurized aboveground storage tanks with a total capacity of approximately 200,000 metric tonnes surrounded by a containment area. Methanol will be transferred by pipeline from the storage area to a deep draft marine terminal to be constructed by the Port on the Columbia River.

During construction, the project is expected to generate up to 1,000 jobs. The project will employ approximately 192 full time employees including administrative and management, production, maintenance, logistics and technical staff. Additional workers will be required to tie up and release vessels calling on the facility and to load the vessel.

The proposed project will receive natural gas from the Kalama Lateral Pipeline project (the proposed pipeline) to be constructed by Northwest Pipeline GP (Northwest Pipeline). The proposed pipeline is a separate related action, , proposed by Northwest Pipeline, and is under the jurisdiction of the Federal Energy Regulatory Commission (FERC)(FERC Docket # CP 15-8). Under the pipeline project, Northwest Pipeline proposes to permit, construct, and operate a 3.1-mile, 24-inch diameter natural gas pipeline to provide 320,000 dekatherms per day of natural gas transportation service to the proposed project. Information on the project is contained in NEPA resource reports prepared for the project in 2012, and the Environmental Assessment prepared by FERC for the project and available on the FERC Docket.

In order to provide electric service to the proposed project, it is expected that Cowlitz PUD will upgrade an existing transmission line from its existing Kalama Industrial Substation to the project site by installing new lines on existing towers within the existing transmission line corridor. New equipment (e.g., 115 kV breakers and switches) would be installed at the Kalama Industrial Substation within the existing footprint of that facility. Cowlitz PUD also has indicated that it may construct a short transmission line (approximately 750 feet) between the Kalama Industrial Substation and an existing 115 kV transmission line on the east side of Interstate 5 (I-5) to provide redundant supply to the substation. This short line would cross I-5, Hendrickson Drive and the railroad and would require installation of new poles. The new lines and improvements to the Kalama Industrial Substation would constitute a related action on the part of the Cowlitz PUD. Cowlitz PUD would acquire any necessary environmental permits for this related action.

6b. Describe the purpose of the project and why you want or need to perform it. [help]

The objective of the proposed project is to construct and operate a manufacturing facility to produce methanol from natural gas using technology that produces less air pollution and greenhouse gas (GHG) emissions than methanol production using coal. This “greener” methanol will be exported to global markets by oceangoing vessel.

Global demand for methanol is high for use as a feedstock for olefin, a component in the manufacturing of many everyday items. Recent forecasts predict an increase in worldwide demand for methanol from 60 million metric tonnes (MMT) in 2013 to 190 MMT in 2023. Currently coal is widely used for methanol production.

The project will provide economic benefit to the region, create jobs, improve access to recreational resources and thus meets the Port’s mission, and produce methanol using a technology that will produce less air pollution and greenhouse gas (GHG) emissions than methanol production using coal. The project will therefore meet the Port’s mission to “induce capital investment in an environmentally responsible manner to create jobs and to enhance public recreational opportunities”.

6c. Indicate the project category. (Check all that apply) [help]

- ☒ Commercial
- ☐ Residential
- ☐ Institutional
- ☒ Transportation
- ☐ Recreational
- ☐ Maintenance
- ☒ Environmental Enhancement

6d. Indicate the major elements of your project. (Check all that apply) [help]

☐ Aquaculture	☐ Culvert	☐ Float	☐ Retaining Wall (upland)
☐ Bank Stabilization	☐ Dam / Weir	☐ Floating Home	☒ Road
☐ Boat House	☐ Dike / Levee / Jetty	☒ Geotechnical Survey	☐ Scientific Measurement Device
☐ Boat Launch	☐ Ditch	☒ Land Clearing	☐ Stairs
☐ Boat Lift	☒ Dock / Pier	☐ Marina / Moorage	☒ Stormwater facility
☐ Bridge	☒ Dredging	☐ Mining	☐ Swimming Pool
☐ Bulkhead	☒ Fence	☐ Outfall Structure	☒ Utility Line
☐ Buoy	☐ Ferry Terminal	☒ Piling/Dolphin	
☐ Channel Modification	☐ Fishway	☐ Raft	

☐ Other:

6e. Describe how you plan to construct each project element checked in 6d. Include specific construction methods and equipment to be used. [help]

- Identify where each element will occur in relation to the nearest waterbody.
- Indicate which activities are within the 100-year floodplain.

Project Activities

The proposed action includes both upland and marine components (Figure A-3 through Figure A-8). This document focuses on the construction of the marine structures, as they are the portion of the project that is the subject of this permit application.

The proposed project will consist of a methanol manufacturing facility; accessory support, and infrastructure facilities; and a new marine terminal on the Columbia River, a constitutionally designated area of commerce. The proposed project also includes compensatory habitat mitigation activities. Finished product will be transferred by pipeline from the storage area to a new deep draft marine terminal to be constructed by the Port on the Columbia River. The proposed marine terminal and berth and proposed compensatory mitigation activities are the only project components that would be located below the OHWM of the Columbia River.

Major Components

Overall, the proposed project will include the following major components:

- **Methanol production components:**
  - Two methanol production lines
  - Interconnecting facilities including piping, product pipelines, electrical and control systems
  - Eight finished product storage tanks within a containment area and additional tanks (rework tanks and shift tanks) for storing raw methanol during the manufacturing process
  - Cooling towers for industrial process water cooling
  - Steam boilers
  - Two air separation units (ASUs) to provide oxygen for the secondary reforming process.
  - Flare system for the disposal of flammable gases during startup, shutdown and malfunctions
- **Power generation facility**
- **Fire suppression infrastructure and risk management system**
- **Water supply and treatment components:**
  - Process water supply wells, treatment system, storage tanks and distribution network
  - Industrial process water treatment and disposal system
  - Stormwater treatment, infiltration pond and disposal system
- **Support buildings and accessory facilities**
  - Security gate houses, laboratory, control rooms, warehouses and other buildings and enclosures
  - Lay-down areas for construction activities, plant maintenance, and spare part storage
  - Electrical substation
  - Natural gas meter station and transfer equipment
  - Emergency generators
- **Site access ways and public recreation access.**
- **Marine terminal including a single berth and a dock with methanol loading equipment**
- **Compensatory mitigation activities**

The proposed project's methanol production activities will generate demand for natural gas and water. Natural gas will be supplied by Northwest Pipeline, which will permit, construct, and operate the Kalama lateral pipeline between its mainline and the project site. The project to install the Kalama lateral pipeline will consist of approximately 3.1 miles of 24-inch diameter pipeline, metering facilities, and miscellaneous appurtenances extending from the mainline of Northwest Pipeline to the proposed project. As noted previously, this pipeline is the subject of a separate permitting process through FERC.

Methanol Production Components

Methanol Production Lines

The proposed project will include two methanol production lines. A methanol production line is a series of equipment that handles each step of the methanol production process. Each methanol production line will produce 5,000 metric tonnes per day of AA-grade methanol from natural gas feedstock. These production

lines will consist of reforming, methanol synthesis and distillation elements. The production lines will occupy approximately 14 acres of the project site (See Figure 3).

Methanol Storage Tanks

Storage tanks will be required for methanol storage during various steps in the production process. All storage tanks will be erected in the field. The project will require 2 rework tanks, 4 “shift” tanks, and 8 bulk product storage tanks (See Figure 3). The rework tanks will hold raw methanol during the production process and will be approximately 82 feet in diameter and 58 feet in height holding up to 2,275,000 gallons. Shift tanks will hold refined methanol for testing prior to discharge to the storage tanks. Shift tanks will be approximately 60 feet in diameter and 50 feet in height holding approximately 1,000,000 gallons.

After final production steps are completed, methanol will be pumped to one of eight bulk product storage tanks prior to be being loaded onto vessels. The bulk product storage tanks will be approximately 105 feet in height and 145 feet in diameter, with a maximum storage capacity of 9,400,000 gallons (approximately 26,000 tonnes). The total storage capacity on site will be 200,000 metric tonnes when accounting for operation limits on the tank capacity. The bulk product storage tanks include an external fixed roof and internal floating roof and would be capped with inert nitrogen gas (a “nitrogen blanket) to keep the oxygen level in the individual tanks to a level below that required for combustion. A piping system will convey methanol from the bulk product storage tanks to the loading arms at the proposed marine terminal.

The bulk product storage tanks will be encompassed by a containment berm or wall approximately seven feet in height. The containment area will be designed with a capacity at least equal to 110 percent of the volume of the largest tank plus precipitation from a 24-hour, 100-year storm event, and will be lined with an impervious membrane to prevent any spills from leaving the containment area via the ground. Stormwater (and/or spills) collected in the containment area will gravity-drain to the berm area sump. The water will be tested and directed to the stormwater infiltration system if found to be of acceptable quality. The sump water will be disposed off-site at an appropriate commercial disposal facility in the event of a spill, or if found to have unacceptable quality.

Cooling Towers

Waste heat from the methanol production process will be managed through cooling towers. The cooling towers will also provide cooling water to various heat exchangers used within the methanol production process. Two cooling towers consisting of five cells each will be installed for the methanol manufacturing facility (one for each production line). The cooling towers will have mechanical draft (fans located on the air outlet of the cooling towers) and countercurrent flow (in which air enters at the bottom and exits at the top, and warm cooling water enters at the top and exits at the bottom). The cooling towers will be approximately 290 feet long, 110 feet wide, and 40 feet tall. Blowdown from the cooling towers will be discharged as described below.

Steam Boilers

The proposed methanol manufacturing facility will include steam boilers fired by natural gas from the pipeline and purged gas from the methanol synthesis unit. The boilers will produce steam for use in the methanol production process.

Air Separation Units

Two ASUs (one for each production line) will be constructed to produce oxygen for use in the reforming process, nitrogen for use in the plant process and to inert equipment during repair and maintenance activities (e.g., to provide inert nitrogen gas for the product storage tanks). The ASUs use a low temperature process to separate various gases from the air. Air from the atmosphere will be drawn into the plant, purified, and then separated into its various elements. The ASUs will consist of an air intake and filter, compressors, washing towers, sieves, distillation element and tanks.

Flare System

A flare system will be used for safe disposal of combustible gases during process upset or an emergency shut down situation, and during the normal start-up and shut-down of the production process. The flare will

be approximately 245 feet in height. The flare will be enclosed and a visible flame would not be present except during the events described above.

Power Generation Facility

The project will meet its electric power demands using a combination of grid electric power and on-site power generation. It is expected that new power lines will be installed on existing poles to the project site and a new substation will be constructed within the project site.

The project will supplement grid electric power with an on-site 125-megawatt (MW) power generation facility. The power generation facility will consist of two natural gas-fired combustion turbines and one steam turbine. Natural gas mixed with air combusts in the gas turbine to generate electricity, and the exhaust gas from each combustion turbine will be used to generate high pressure steam to produce power through a steam turbine. The exhaust stacks will be the tallest element of the power generation facility and will be approximately 90 feet tall.

Waste heat from the power generation facility will be managed through cooling towers. One cooling tower with two cells will be installed for the power generation facility. This will be located adjacent to the cooling towers installed for the methanol production process.

Fire Suppression Infrastructure and Risk Management

The proposed project's operations and risk management system will meet or exceed local, state, and federal codes and regulations in order to minimize the risk of fire, leak, personal injury, and other health and safety impacts. The project proponent will develop a written emergency response plan, which will be reviewed and approved by local and state agencies before operations begin. The proposed project will include full emergency response capabilities to respond to all incidents within the methanol manufacturing facility or on the proposed marine terminal.

The proposed project will include a fire station to house the on-site fire brigade to respond to emergencies at the facility as well as an emergency response vehicle. The proposed project will also include an emergency alarm system with alarm boxes located throughout the facility.

In addition to the on-site fire brigade, the proposed project will include a comprehensive fire suppression system including: 1) a fixed-foam system for fire suppression; 2) portable foam generators; 3) fire water system; 4) deluge system; and 5) fire extinguishers.

Water Supply and Treatment Components

Water Supply and Treatment

Water will be needed during both construction and operations. For construction, the major water uses are anticipated to be:

- General site use and dust control,
- Ground improvements, and
- Hydrostatic testing of pipelines and tanks.

The proposed project will require water for process uses as well as for domestic uses (e.g., drinking, sanitation, showers, etc.). Process water will be provided by a collector well (Ranney well) to be constructed by the Port near the Columbia River shoreline. The well will be constructed under Groundwater Permit No. G2-30283 issued by the Washington State Department of Ecology (Ecology). The groundwater permit allows the use of up to 10,640 acre feet[3] and 6,600 gallons per minute (gpm) of water for various uses, including industrial activities. It is estimated that the proposed project will use approximately 3.6 to 7.2 million gallons per day (mgd) of process water, or approximately 8,000 acre feet

[3] An acre foot contains approximately 325,851 gallons of water.

or 5,000 gpm. The collector well will also be equipped with a back-up natural gas run generator, for periodic, short-term use.

The process water system will consist of a 22-foot-wide (inside diameter) collector well approximately 100 feet in depth, and a 2,200-square foot pump station facility. The pump station will be equipped with a total of three 4.5 mgd pumps (200 hp), to provide a firm capacity of 9 mgd (one in standby). The pump station will be able to support additional pumps if they are needed to satisfy future demand. A redundant process water supply would be provided by three existing backup wells operated by the Port.

The pump station will convey raw water to the water treatment supply tanks via pipeline. The pipeline will be provided with a blow off valve for flushing that will be discharged to an infiltration basin near the point of discharge. The infiltration basin could also be used to manage overflow and draining the water supply tank. Stormwater from the pump station facility will be captured and routed to an infiltration basin immediately north of the new pump station. This infiltration basin will also receive blow off from the pump station during pump start up as required.

Raw water delivered to the methanol manufacturing facility will be treated prior to use in methanol production. The initial stage of raw water treatment will be precipitation softening using a cold-lime softener (CLS). Precipitation softening processes are used to reduce raw water hardness, alkalinity, silica and other constituents including the iron and manganese. Water from the CLS will be used for cooling tower make-up water and a portion will be routed to a combined Reverse Osmosis and Electro Deionization (RO-EDI) system. The RO-EDI system will produce high purity feed water necessary for the auxiliary boilers, power generation plant, and methanol production process.

Potable water for domestic uses (e.g., drinking water, sanitation, showers and other general uses) will be supplied from a connection to the City of Kalama water system. Alternatively, the proposed project may receive potable water from the Port of Kalama's water supply system rather than the City of Kalama. Water treatment would be provided on-site if potable water is supplied by the Port.

The volume of water withdrawn from groundwater will be insubstantial relative to the flows in the Columbia River; flows in the tidal portions of the river typically range between 110,000 and 400,000 cfs (http://waterdata.usgs.gov/wa/nwis/). (The average discharge of the Columbia River at its mouth is approximately 265,000 cfs [Kammerer 1990]). The approximately 5,000 gpm that the project will use represents approximately 11.14 cfs, which represents less than 0.01% of even the lowest anticipated flows in the river. Ranney wells pull water out of deep alluvium in the river bottom, avoiding any possibility of impinging or entraining fish.

Wastewater Treatment and Disposal

Sources of wastewater from the proposed project include domestic and process wastewater streams.. Domestic wastewater will be generated from the restrooms, on-site wash basins, and breakrooms. Industrial process wastewater includes reject streams from raw water treatment and polishing, treated discharge from the methanol production process, and blow down from on-site cooling, power generation, and boiler systems. Discharges from the site will be routed through and discharged only from the cooling towers. Other waste streams on-site will be treated and re-used on-site or discharged to the cooling tower for make-up water. The proposed project will require an individual industrial National Pollutant Discharge Elimination System (NPDES) permit for discharges of cooling tower blowdown to the Columbia River. Domestic wastewater from the proposed project will be discharged to the existing Port of Kalama Wastewater Treatment Plant. The treatment plant discharges through a common outfall shared with the Steelscape facility to the Columbia River pursuant to an NPDES permit held by the Port of Kalama.

The cooling towers will discharge wastewater to the firewater pond for temporary storage and to maintain sufficient fire water. Discharges from the firewater pond will be treated for temperature through a heat exchanger to a maximum discharge temperature of 20-degrees Celsius prior to discharge to the Columbia River through the Port of Kalama's existing outfall.

The methanol production process will produce a process wastewater stream of approximately 35 gpm that would be recycled and reused on-site. This process wastewater stream will be treated with a membrane bio-reactor (MBR). The MBR will be an aerobic biological treatment with ultrafiltration. Discharges from the MBR will be directed to the RO/EDI for re-use on-site.

Wastewater generated by auxiliary boilers and/or the on-site power generation consist of condensate that will be discharged to the RO/EDI and/or the cooling towers for re-use. The cooling towers will re-use the water for a specified number of cycles prior to discharge of the blowdown. Blowdown from the cooling towers is anticipated to be less than 400 gpm and will be discharged directly to the fire pond, as described above.

Stormwater Treatment

Stormwater from the proposed methanol manufacturing facility will be segregated into two streams depending on the potential for contact with industrial activities. Stormwater from areas of the project site which are physically separated from the production process and from on-site paved areas will be directed to an infiltration facility for discharge. Stormwater from the production process areas of the facility will be directed to a first flush pond for treatment. The first flush pond will discharge to the infiltration facility.

Stormwater from the first flush pond may be re-used on-site as raw water. Stormwater re-use from the first flush pond will be treated through a coalescing plate oil-water separator and a granulated activated carbon filter prior to discharge into the CLS for re-use. The first flush pond and infiltration facility will be sized to manage stormwater on-site consistent with Cowlitz County and state standards. The infiltration pond will be sized to infiltrate the 100-year, 24-hour rainfall event.

Detailed spill prevention, control and countermeasures including isolation valves and monitoring requirements will be implemented across the site in accordance with applicable requirements.

An existing weir and outfall used for the USACE dredging project will be removed as part of the project. The weir will be left in place during dredge material placement, if placement occurs at the site, and will then be removed.

Stormwater generated from site access roadways outside of the methanol manufacturing facility will be directed to roadside ditches and shallow containment to infiltrate.

Stormwater from the existing Steelscape dock and the proposed new dock will be collected and conveyed to a pumping station located at the transition from the platform to the access trestle. All pumped flows will be conveyed upland to water quality swale for infiltration.

Water quality storm flows from the dock will discharge to an oil/water separator prior to discharge to a water quality swale, designed in accordance with Ecology criteria. After passing through the swale, the runoff will be directed to a newly constructed infiltration ditch located upland. The proposed infiltration ditch will be approximately 495 feet long with a bottom width of 12 feet and depth of 5 feet. Flows exceeding the water quality storm flow rate will bypass the oil/water separator and water quality swale and be discharged to the infiltration area. This infiltration ditch will also accommodate stormwater flows from the existing North Port dock and yard area, as well as the new collector well pump house and surrounding area. Stormwater from these areas are currently directed to an infiltration ditch that will be replaced as described above.

Any accidental spills from pipelines on the dock will be captured on the dock surface and collected by the stormwater system. Valving will be installed on the storm conveyance pipes so that the spill could be diverted to a separate pumping system that will convey the contaminated water back to the proposed methanol manufacturing facility for treatment and reuse.

Support Buildings and Accessory Facilities

The proposed methanol manufacturing facility will include several support buildings and accessory facilities. These buildings and facilities include a control building and laboratory, motor control center units (MCC), security gate house, electrical substation, a natural gas meter station and transfer equipment, and

an emergency diesel generator. The project proponent would have office space in the Port or elsewhere for administrative offices associated with the proposed methanol manufacturing facility.

The control building and MCCs will house control centers for facility operations. The laboratory will be used to test the finished methanol product for purity. The control center and laboratory will be housed together in a building that will be approximately 6,400 square feet. The MCC controls will be approximately 14,000 square feet.

A small security gate house will be located at the entrance to the proposed methanol manufacturing facility. Warehouse and maintenance buildings will be constructed to house maintenance equipment and vehicles

A natural gas meter station and transfer equipment will be constructed to receive natural gas from the pipeline and stabilize the flow rate and pressure of the gas. The proposed methanol manufacturing facility will also include a diesel-fired emergency generator for use during power outages.

Site Access

The proposed project will develop and improve roadways around the project site to provide access to the proposed methanol manufacturing facility, improve recreational access for the public, and provide emergency access to the site. Access to the proposed methanol manufacturing facility will be provided from Tradewinds Road in the northeast portion of the project site. None of these access improvements will require filling or directly disturbing waters of the United States or state waters.

The proposed project will include three primary road improvements: (1) improving Tradewinds Road along the north side of the project site; (2) creating a new roadway connecting Eastwind Road to Tradewinds Road; and (3) improving an existing gravel roadway along the south side of the project site.

The proposed project will improve recreational access to the Columbia River and the areas north of the project site by improving Tradewinds Road and creating a new parking area near the Columbia River. Access to this parking area will be provided by Tradewinds Road along the north boundary of the project site. Tradewinds Road will be improved by the Port by extending the paving 3,400 feet from the intersection with Eastwind Road. The improved road will be 24 feet in width and consist of two 12-foot travel lanes and be approximately 3,400 feet in length.

Tradewinds Road connects with Kalama River Road, which is a County-owned roadway with a 35-mile per hour (mph) speed limit. It crosses over the BNSF rail corridor and connects to I-5 approximately a quarter-mile east of the project site. I-5 is Washington's main north-south highway and extends from Canada to Mexico. At this location, I-5 consists of three travel lanes in each direction with a posted speed limit of 70 mph.

Eastwind Road is located within the footprint of the proposed project and that portion of the road will be abandoned. The Port will construct a connection from Eastwind Road to Tradewinds Road south of the proposed project to maintain access to the existing Air Liquide facility and the Port's wastewater treatment plant. The new road will be approximately 720 feet long and 24 feet wide with two 12-foot travel lanes.

Access along the southern boundary of the project site will be provided by a westbound extension of Eastwind Road. This road will extend from the existing southern terminus of Eastwind Road west to the existing warehouse (to be converted to the proposed project's fire station) by improving an existing gravel road. The road will be approximately 1,400 feet long and 24 feet wide with two 12-foot travel lanes.

All three new and/or improved roadways will be designed consistent with the Cowlitz County Rural Low Volume Access standard. Construction of the roadways will require subgrade excavation and surface compaction, base and top course placement and compaction, and asphalt surfacing. The improvements to Tradewinds Road and the connection from Eastwind Road to Tradewinds Road will also require cuts and fills. Stormwater on the roadways improved outside of the project site boundary will flow to roadside

ditches and shallow containment to infiltrate. Stormwater generated from the roads within the project will be directed to the proposed project's stormwater system.

Recreation Access

Tradewinds Road is an existing roadway and parking turn around that extends to the river in the northern portion of the project site. The Port currently allows informal recreation access to portions of the Port that are not fenced for security purposes. Recreation use is focused on the sandy beach along the Columbia River and informal trails located north of the project site. The Port intends to allow continued access to these areas, consistent with project and federal security requirements, and will improve Tradewinds Road and develop a formal parking area at the end of end if the road at the Columbia River as part of the proposed project. The area will provide parking for approximately 21 vehicles and allow recreational users to park and access the beach, river, and informal trails.. The parking and other improvements will not require filling or directly disturbing waters of the United States or state waters.

In-Water and Overwater Components

Dock Construction

The proposed marine terminal will be located on the western portion of the project site at approximately RM 72 and will consist of a single berth to accommodate the oceangoing tankers that will transport methanol to destination ports. The marine terminal will include a dock, a berth, loading equipment, utilities and a stormwater system. These components are designed to support the necessary product transfer equipment and safely moor the vessels that may call on the proposed project (see Figure 4). The marine terminal will provide sufficient clearances from the existing North Port dock and space that will be required for vessel maneuvering during berthing and departure.

The marine terminal would be designed to load methanol onto oceangoing vessels that can handle methanol as a cargo. Vessels would arrive at the terminal from the Pacific Ocean via the Columbia River navigation channel. As noted above, the dock would be designed to accommodate vessels ranging in size from 45,000 DWT to 127,000 DWT, which would include vessels measuring from approximately 600 feet to 900 feet in length and 106 feet to 152 feet in width.

The typical speed of the types of vessels that would serve the proposed project is 15 knots in the ocean and 10 knots in the Columbia River. Vessels would be piloted across the Columbia River Bar and up the river to the terminal as required by state and federal regulations. Assist tugs would help vessels arriving at and leaving the berth. Based on the typical vessel size and production of the plant, an estimated 3 to 6 ships per month or 36 to 72 ships per year would use the berth for loading and unloading methanol. Additional ships may use the berth for other cargo loading and unloading, for vessel supply operations, as a lay berth, for short- and long-term vessel moorage, and for topside vessel maintenance activities.

The dock structure will consist of an access trestle extending from the shoreline to provide vehicle, equipment, and emergency access to the dock. The trestle will be 34 feet wide and approximately 365 feet long. From the access trestle, the berth face of the dock will extend approximately 530 feet downstream, and will consist of an approximately 100-foot by 54-foot transition platform, a 370-foot by 36-foot berth trestle, and a 104-foot by 112-foot turning platform (see Figure 4).The dock will be supported by precast 24-inch octagonal concrete piles supporting cast-in-place (CIP) concrete pile caps and precast, prestressed, haunched concrete deck panels. The dock will total approximately 44,943 square feet and include 320 concrete piles and 16 steel pipe piles. The bottom of the superstructure (deck, pile caps, etc.) will be located above the ordinary high water mark (OHWM).

For vessel mooring, two 15-foot by 15-foot breasting dolphins will be constructed near the center of the berth trestle. Steel plates will bridge the short distance between the dock and dolphins. Each breasting

dolphin will consist of seven 24-inch precast, prestressed concrete battered[4] piles supporting a cast-in-place concrete pile cap with mooring bollards.

Four 15-foot by 15-foot mooring dolphins will be constructed (two upstream and two downstream of the platforms) for securing bow and/or stern lines. Each mooring dolphin will consist of 12, 24-inch diameter precast 24-inch octagonal diameter concrete piles supporting a cast-in-place concrete pile cap. The dolphins will be equipped with mooring bollards and electric capstans. Access to the mooring dolphins will be provided from the platform by trussed walkways with open grating surfaces. The walkways will be 3 feet wide with a combined length of 375 feet and will be supported by four 18-inch diameter steel pipe piles.

The fender system will consist of 9-foot by 9-foot ultra-high molecular weight polyethylene (UHMW-PE) face panels with a super cone fender unit and two 12-inch diameter steel pipe fender piles. Below the fender panels, the fender piles will have 18-inch-diameter high-density polyethylene sleeves. Fender units will be placed on the dock face, two upstream and two downstream, and on the two breasting dolphins.

A small building will be constructed on a corner of the turning platform. The building will function as a shelter from the weather and a small lunch area for the dockworkers and as a place to store tools and supplies. Electricity and communication services will be provided to the shelter but no water or sewer services will be provided. A second small building will be constructed at the center of the dock, adjacent to the loading arms. The building will be used as an operations shack for the loading arms. Electricity and communications services will be provided to the shelter but no water or sewer services would be provided.

As described above, stormwater from the dock will be collected and conveyed to an upland treatment and infiltration swale. The stormwater system will also accommodate stormwater from the existing North Port dock, which is currently infiltrated in an upland swale that will be removed for the development.

Since pile layout is conceptual, a 10 percent contingency has been added for the estimated number of concrete piles. This will accommodate potential revisions to the pile layout and configuration as the structural design is finalized. The project may also require the installation of temporary piles during construction. Temporary piles are typically steel pipe or h-piles and will be driven with a vibratory hammer. These are placed and removed as necessary during the pile driving and over-water construction process.

With the addition of the contingency, the proposed terminal will require the installation of approximately 320, 24-inch concrete piles; 12, 12-inch steel pipe piles; and 4, 18-inch steel pipe piles.

- A total of approximately 1,079 square feet of new benthic impact will be associated with new pile footprints. In addition, the proposed terminal itself will result in a total of approximately 44,943 square feet of new solid overwater coverage.
- With the single exception of a portion of the access trestle, the design of the terminal locates the platforms, dolphins, and structures in water deeper than 20 feet below OHWM (11.6 feet CRD). This placement of the structure in deeper water minimizes the effects to aquatic habitats. Approximately34,018 square feet of the total new overwater coverage, and approximately 906 square feet of new benthic impact associated with new pile footprints, will be located in water deeper than 20 feet below OHWM.
- Approximately 10,925 square feet of new overwater coverage associated with the access trestle, and a total of approximately 173 square feet of new benthic impact associated with new pile footprints for the access trestle, will occur in and over shallow water habitat (water shallower than 20 feet below OHWM). The requirements for vehicle access and safety dictate the design and configuration of the access trestle. The trestle has been designed to be the minimum width capable of performing its function. The trestle is by necessity a solid structure due to equipment and vehicle loads and the need to capture stormwater, and will not be grated.

[4] "Battered" piles are installed at an angle to vertical as opposed to plumb piles which are installed vertically

The table below summarizes the unavoidable aquatic habitat impacts that the proposed project will represent.

Table 1. Summary of Aquatic Habitat Impacts

Shoreline Location Description	Area of Overwater Coverage		Number of Piles			Area of Pile Footprint (sf)
	Solid	Grated	24-inch Concrete	12-inch Steel	18-inch Steel	
Shallow Water (USACE OHWM elevation [11.6 CRD] to 20 feet below USACE OHWM)						
Access Trestle	10,925	N/A	52	-	-	173
Subtotal	10,925	N/A	52	-	-	173
Deep Water (deeper than 20 feet below USACE OHWM)						
Access Trestle	1,450	N/A	9	-	-	30
Transition Platform	5,400	N/A	41	-	-	136
Berth Trestle	13,470	N/A	58	-	-	192
Turning Platform	11,648	N/A	68	-	-	225
Fender System	N/A	N/A	-	12	-	11
Breasting Dolphins (2)	450	N/A	14	-	-	46
Mooring Dolphins (4)	800	N/A	48	-	-	159
Grated Walkways	N/A	1,588	-	-	4	7
Subtotal	34,018	1,588	290	12	4	806
10% Contingency for Concrete Piles*	N/A	N/A	30	N/A	N/A	100
Total In-/Over-Water	**44,943**	**1,588**	**320**	**12**	**4**	**1,079**

*Pile layout is conceptual. A 10% contingency has been included (for concrete piles) for purposes of permitting review.

Berth Dredging

The existing berth serving the Port's North Port Terminal will be extended downstream to accommodate vessel activities at the new dock. The extended berth area will be deepened to -48 feet Columbia River datum (CRD) with a 2-foot overdredge allowance consistent with the existing berth. The berth will extend at an angle from the edge of the Columbia River navigation channel to the berthing line at the face of the proposed dock. The footprint of the expanded berth will be approximately 18 acres, of which approximately 16 acres will require dredging to achieve the berth depth. Figure 5 shows a map of the proposed berth and area to be dredged. Existing water depths in the proposed berth area vary from -50 feet CRD to -39 feet CRD. The total volume to be dredged the first year is approximately 126,000 cubic yards (cy). The dock and berth arrangement and design were developed in coordination with the Columbia River Pilots.

Sediment characterization for dredged material placement suitability was conducted in February 2015. Characterization of sediments in the aquatic area was performed in accordance with the USACE Portland Sediment Evaluation Team (PSET) and its interim final guidelines, *Regional Sediment Evaluation Framework* (US Army Corps of Engineers et al. September 2009), for the Lower Columbia River Management Area. The dredge material characterization report is included as Appendix C. Results indicate that the sediment samples did not exceed the sediment quality guidelines and, as such, the material proposed for dredging and placement will be suitable for placement at any of the existing Port placement sites (including in-water and upland placement sites) and on the upland portion of the project site.

Dredged material will be placed upland at the project site to provide material for construction or for other uses, or it may be placed at existing authorized in-water and upland placement sites. The existing authorized (NWP-1994-462-1) in-water placement locations include: 1) flow lane placement to restore

sediment at a deep scour hole associated with a pile dike at RM 77.48 located on the Oregon side of the river; 2) flow lane placement to restore sediment at a deep scour hole associated with a pile dike at RM 75.63 located on the Washington side of the river; 3) beach nourishment at the Port's shoreline park (Louis Rasmussen Park) at RM 76; and 4) the Ross Island Sand and Gravel disposal site in Portland, Oregon. The available upland placement sites include the South Port site located north of the CHS/TEMCO grain terminal at approximately RM 77 and the project site. Additional in-water and upland sites may be identified and permitted for dredge material placement for general Port maintenance dredging needs in the future.

Maintenance dredging will likely be required to maintain the berth to the permitted depth. This activity will occur in the same manner as used for the establishment of the berth. The volumes and frequency of maintenance dredging events will vary based on the needs of the facility and the rate of shoaling. It is estimated that an average of 27,000 cubic yards of sediment could be deposited yearly. Maintenance dredging will be permitted separately as part of the Port of Kalama's maintenance dredging program.

Aquatic and Riparian Habitat Mitigation Construction

The Applicant has incorporated mitigation activities as part of the proposed action. The Applicant proposes three categories of activity: 1) pile removal; 2) engineered log jam (ELJ) installation; and 3) riparian habitat restoration and wetland buffer enhancement. Mitigation is discussed in greater detail in section 8 of this application.

Pile Removal: The Applicant will remove portions of two rows of existing timber piles now located in the freshwater intertidal backwater channel portion of the project site on Port property. One of these timber pile structures (the interior structure) is a USACE-owned pile dike. USACE indicated that these piles are likely untreated (personal communication between Tabitha Reeder, Port of Kalama, and Jessica Stokke, USACE on August 18, 2015). The downstream structure is a former trestle, and these piles may be treated with creosote. Piles are estimated to range between 12 and 14 inches in diameter at the mudline. A total of approximately 320 piles will be removed from the two structures (Figure 12).

The removal of these piles will restore a minimum of approximately 251 square feet of benthic habitat, within an area approximately 0.73 acres in size. These pile structures, in their current configuration, affect the movement of water and sediment into and out of approximately 13 acres of this backwater area. The removal of the piles will facilitate sediment transport and seasonal flushing of this backwater area (CHE 2015), which will help improve water quality and maintain this area as an off-channel refuge for juvenile salmonids in the long term. Coast and Harbor Engineering has analyzed the hydraulic implications of removing these piles, and determined that the proposed pile removal activities will not have any measurable or significant effect on the navigation channel (CHE 2015).

ELJ Installation: In addition to the proposed pile removals, the Applicant will install eight ELJs along the nearshore habitat along the Columbia River shoreline adjacent to the site. ELJs are a restoration and mitigation method that helps build high quality fish habitat, develops scour pools and associated tailout spawning areas, and provides complex cover. Each ELJ will measure approximately 20 by 20 feet and be composed of large-diameter untreated logs, logs with rootwads attached, small wood debris, and boulders.

These large wood structures will increase complex in-stream and overhead cover with interstitial spaces that will allow juvenile and adult salmonids to evade predation by marine mammals, birds, and fish. Each ELJ will be a minimum of approximately 400 square feet in size, and the eight structures will represent a total of 3,200 square feet of new large woody material, installed along approximately 800 linear feet of Columbia River shoreline in a reach of the Columbia River that is lacking nearshore habitat structure and woody debris. The log jams will provide natural cover, refuge, and foraging opportunities for outmigrating juvenile salmonids.

Riparian Restoration and Wetland Buffer Enhancement: The Applicant also proposes to conduct riparian enhancement and invasive species management within an area approximately 1.41 acres in size along approximately 700 linear feet of the Columbia River shoreline at the site to further enhance riparian and shoreline habitat at the site. The Applicant also proposes to enhance approximately 0.58 acres of

wetland buffer at the north end of the site to offset unavoidable wetland buffer impacts. The riparian and wetland buffer habitats will be enhanced by removing invasive species and installing native trees and shrubs that are common to this reach of the Columbia River shoreline and adjacent wetlands. Native plantings proposed for the riparian restoration include black cottonwood and a mix of native willow species including Columbia River willow (*Salix fluviatilis*), Pacific willow (*Salix lasiandra*), and Sitka willow (*Salix sitchensis*). Portions of the wetland buffer will be planted with black cottonwood. Invasive species management at the site will target locally common and aggressive invasive weed species, primarily Scotch broom and Himalayan blackberry (*Rubus armeniacus*). The restoration sites will be monitored and maintained for 5 years to document proper site establishment.

Construction Methods

Proposed in-water work will be conducted only during the in-water work window that is ultimately approved for this project. The currently published in-water work window for this reach of the Columbia River is 1 November – 28 February. However, regulatory agencies, including the USACE, WDFW, US Fish and Wildlife Service (USFWS), and the National Marine Fisheries Service (NMFS), have recently suggested making modifications to the window to take into account the best available science and to address newly listed species. The following work windows are proposed for this project, as explained further below:

- Pile installation will be conducted between 1 September and 31 January
- Dredging will be conducted between 1 August and 31 December
- ELJ installation will be conducted between 1 August and 31 December
- Pile removal may be conducted year-round
- Work conducted below the OHWM, but outside the wetted perimeter of the river (in the dry) may be conducted year-round

These work windows are necessary to accommodate the construction schedule, while simultaneously being cognizant of avoiding biologically sensitive periods for given activities. One of the considerations for timing driving is the need to conduct all or most berth dredging prior to pile installation. The proposed dredging window is designed to begin early enough in the season to allow pile driving activities to begin on schedule, while avoiding the bulk of the peak juvenile salmonid outmigration in the spring/summer, and the peak run timing for Pacific eulachon in the late winter/early spring. An early pile installation window will minimize the need for pile installation to be extended into the late winter/early spring timeframe. The project proposes to use impact driven concrete structural piles (rather than steel), which are not known to result in injurious levels of underwater noise. For this reason, an early start to the pile installation window will not result in adverse effects to any fish or other aquatic species. ELJ installation could be conducted during late summer, fall, or early winter, to accommodate the range of times when Columbia River water levels could be low, to allow for improved access to the shoreline, and to minimize disturbance to the aquatic environment. Pile removal activities, and work conducted below the OHWM, but outside the wetted perimeter of the river (i.e. in the dry) are not expected to result in significant impacts to aquatic species or resources, and as such these activities could be conducted year-round.

Construction crews and methods will be influenced by weather, timing, and available equipment as well as this timeframe.

The proposed project would be developed in one or two phases. The construction duration would be approximately 26 to 48 months depending on whether it is built in one or two phases. Construction is expected to begin in mid-2016 and be completed as early as mid-2018 and as late as mid-2020.

It is anticipated that pile driving will be completed over approximately 120 days (not necessarily consecutive) during the 2016–2017 and/or 2017-2018 in-water work windows. Ordinarily, work will be conducted during standard daylight working hours, roughly 8 to 10 hours a day.

Mobilization

During this task, the contractor will mobilize labor and equipment to the site. Most of the activities are for water-based equipment that will be mobilized and operated from a barge. Depending on the activity, two or four barges will be needed.

Pile Installation

New piles will include 12- and 18-inch diameter hollow steel piles and 24-inch pre-cast octagonal concrete piles. Piles will be installed using vibratory and/or impact hammers (depending upon pile type, as described below), most likely operated from a barge. Piles will most likely be transported to the site and stored on site on a work barge. The contractor's water-based equipment will be a barge-mounted crane with pile-driving equipment and a materials barge with piles. At times, a second barge-mounted crane may be on site with an additional materials barge.

Concrete piles will be installed with an impact hammer. A bubble curtain will not be used during impact driving of concrete piles, as impact installation of concrete piles does not generate underwater sound pressure levels that are injurious to fish. A conservative estimate is that a maximum of 6 to 8 piles will be impact-driven per day, with an estimated maximum of approximately 1,025 strikes per pile. Based on these estimates, it is assumed that up to approximately 8,200 strikes per day might be necessary to impact-drive concrete piles to their final tip elevation. Actual pile driving rates will vary, and a typical day will involve fewer piles and fewer strikes. An estimated 120 total days of pile driving (not necessarily consecutive) will be required over the duration of the project.

It is anticipated that all steel piles will be driven with a vibratory hammer, and that it will not be necessary to impact drive or impact proof any of the steel piles. If it does become necessary to impact-drive steel piles, a bubble curtain or similarly effective noise attenuation device will be employed to reduce the potential for effects from temporarily elevated underwater noise levels.

All pile installation will be conducted during the in-water work window that is ultimately approved for this project. (This request assumes a window of 1 September through 31 January for pile installation.)

Overwater Construction

Overwater construction activities include those that are waterward of the OHWM mark, but that are conducted above the OHWM elevation. They include the installation of pile caps, decking, fenders, and associated overwater structures. These overwater structures will include a combination of cast-in place and precast concrete structures, grated steel walkways, and associated structures such as rails, fenders, bollards, etc. Similarly, there may be a need to conduct construction activities below the OHWM elevation, but under dry conditions (outside the wetted perimeter of the river).

Overwater activities and activities conducted in the dry below OHWM will be conducted according to the best management practices (BMPs) established for the project which will minimize any potential for impacts to water quality such as spills or release of construction debris into the waters at the site. These activities will therefore not be limited to an in-water work window.

Once the piles have been driven, temporary falsework will be built for the cast in place concrete pile caps. Watertight formwork will be built on the falsework, and the steel reinforcing cage for the pile cap will be constructed. The falsework and formwork may extend below the OHWM but likely will be above the actual water level at the time of construction.

After the cage has been completed and side forms have been placed, the concrete will be cast and allowed to cure; then falsework and formwork will be removed. Most of this work will be accomplished using water-based equipment. Concrete will be delivered to the site by ready-mix trucks and placed by pump or crane-supported bucket. Casting concrete for pile caps, even if forms extend below the OHWM elevation, will not be restricted to an in-water work window.

Following the pile cap installation, the pre-cast or combination of pre-cast/cast in place deck panels will be installed. If cast in place construction is required, it will be similar to that for the pile caps. If pre-cast, the deck panels will be brought to the site by truck or barge in a completed form and placed by crane. They will be made continuous over the pile caps with welded connections and grouted in place. Their placement will

be followed by a second-stage cast in place pile cap poured to deck level. This will be followed by the cast in place deck topping that will form the dock surface.

Surface features such as loading arms, pipe racks, fenders, and bollards will be installed; they will be manufactured off site, arrive at the site by land or water, and be installed with a crane.

Aquatic Habitat Mitigation Construction

Aquatic habitat mitigation construction activities will most likely be conducted using cranes and similar equipment operated from one or more barges temporarily located within the backwater area. Because water depths are relatively shallow in the backwater area where pile removal will be conducted, equipment access to this area may be limited. A small barge will most likely be floated in on a high tide, grounding out if necessary as waters recede. Benthic habitats and native plant communities are not expected to be affected by the barge, as substrates are silt-dominated, and vegetation consists primarily of reed canarygrass. If necessary, disturbed areas will be restored to their original or an improved condition after pile removal is complete.

The piles most likely will be removed by direct pulling. A vibratory hammer may also be used if necessary.

Small equipment operated from a barge will be used to construct the ELJs. Anchor piling will be installed by a vibratory hammer, or will be pushed directly into the substrate with crane-mounted equipment. Logs and debris will be placed using crane-mounted equipment, or similar.

Dredging

Dredging is a temporary construction activity, conducted in deep water, which would be expected to have only minor, localized, and temporary effects. No dredging would be conducted in shallow water habitats, and no shallow water habitat would be converted to deep water.

Dredging operations may be completed using either hydraulic or mechanical (clamshell) dredging methods. A hydraulic dredge uses a cutter head on the end of an arm that is buried, typically 3 to 6 feet deep, in the river bottom and swings in a 250- to 300-foot arc in front of the dredge. Dredge material is sucked up through the cutter head and the pipes, and deposited via pipeline to the placement areas. The hydraulic dredge will also be used for placement of dredge material in the flow-lane, as beach nourishment, or at approved upland sites.

A mechanical dredge removes material by scooping it up with a bucket. Mechanical dredges include clamshell, dragline, and backhoe dredges. Mechanical dredging is performed using a bucket operated from a crane or derrick that is mounted on a barge or operated from shore. Sediment from the bucket is usually placed directly in an upland area or on a scow or bottom dump (split) barge. In-water placement of the material occurs through opening the bottom doors or splitting the barge. The process of splitting will be tightly controlled to minimize turbidity and the spread of material outside the placement area.

Upland placement will likely be completed through the use of a hydraulic pipeline. In this method, dredged material is pumped as a slurry through a pipeline that floats on the water using pontoons, is submerged, or runs across dry land. Dredged material transported by hydraulic pipeline to an upland management site must be dewatered prior to final placement or rehandling. In this case, dewatering generally will be accomplished using settling ponds or overland flow. Settling ponds are sized based on the settling characteristics of the dredged material and the rate of dredging. Water from the sediments will be either infiltrated to the ground or will be discharged to the river through weirs already constructed at the disposal sites.

Several BMPs and conservation measures will be implemented to minimize environmental impacts during dredging, and these are described in Section 8a.

Manufacturing Facility Construction

Ground Improvements

At this point in the design process, a range of design measures are being considered that will address the seismic hazards of the project site and meet code performance requirements. These measures may include a ground improvement program that could be implemented to improve the existing subsurface soils and reduce the risk of ground movement during an earthquake.

Ground improvement measures may include:

- **Vibro-replacement (stone columns)** is a ground improvement technique that can densify relatively clean granular soils using a vibratory probe. This method of ground improvement could be used to reduce the potential of project site soils for liquefaction, lateral spreading, and seismic settlement during an earthquake. The probe is vibrated and jetted into the ground until it reaches the bottom of the improvement zone. Stone aggregate is added to the void created by the probe after reaching the bottom of the treatment zone. The aggregate is densified by lowering the probe into the aggregate in small lifts until reaching the ground surface, creating columns of compacted aggregate. Stone columns can also be used in silty soil; however, in these soils, the stone columns are installed in a tighter configuration and act more as reinforcement elements rather than to densify the adjacent ground.

- **Soil mixing and jet grouting** are ground improvement methods that mix cement into the in-situ soils to create columns of soil with improved strength and stiffness. This method of ground improvement could be used to provide foundation support and limit seismic settlement of structures or to reduce lateral spreading to tolerable levels. During soil mixing, wet or dry cement is mixed with the in situ soils by a mechanical paddle that is advanced similar to a drill. The diameter of the soil-cement column depends on the diameter of the paddle. Jet grouting makes soil/cement columns by injecting cement grout through high-velocity grout jets. The jets erode the in situ soil and mix it with cement and sometimes with air and water. Jet grouting can be used to construct improved soil/cement columns or columns can be overlapped to create continuous panels.

  Lateral spreading is often addressed by constructing a zone, or buttress, of improved soil along the riverbank (above the OHWM) that will not liquefy. The buttress would be of sufficient width, extent, and depth to maintain stability following ground shaking and minimize or prevent lateral displacements toward the river of the upland portion of the site behind the buttress.

- **Driven piles** could be installed to develop foundation capacity below the depths at which liquefaction-induced settlement is a concern. With this measure, structures within the proposed project would be able to resist compressive, uplift, and lateral loads.

Ongoing design and analysis will determine the final configuration and specific locations of the ground improvements to be installed, and the improvement techniques may be refined as the design progresses.

Collector Well

Process water will be supplied by a collector well to be constructed by the Port. The well will be located on the Columbia River shoreline north of the proposed dock and trestle. The collector well consists of a mechanically excavated central concrete caisson that extends below the ground surface to penetrate the zone of water-saturated rock, sand, and gravel that serves as the water source. From this central caisson well, screens extend laterally outward in a radial pattern to collect the groundwater and direct it to the caisson where it is collected and pumped to the treatment source.

Construction will begin with preparation of the site including construction of a gravel access road and site preparation such as vegetation removal, grubbing, grading of the work site and potential test boring. The central caisson will be constructed of interlocking steel or concrete sections that will be constructed from the surface down in lifts beginning with the bottom of the well. The first lift will consist of a cutting edge for establishing the excavation. After the construction of the first lift, at the surface a crane with a clamshell

excavator will remove material from inside the lift allowing the cutting edge to lower into the earth. As the well is excavated, additional lifts will be added and additional material excavated until the well reaches the planned depth. All removed soils will be taken off site or, if suitable, used for fill in other locations on the site.

When the caisson reaches the designed well depth, estimated to be approximately 106 feet below the existing ground surface, a floor will be installed inside the caisson to seal the inside of the caisson from the river and the surrounding aquifer, and will provide a solid concrete floor at the bottom of the Collector Well and a base from which to install the infiltration laterals. Once the floor has set, a pump will be used to dewater the caisson to allow installation of the laterals. The water will be piped and discharged to an existing stormwater swale on the property.

200-foot infiltration laterals will be installed through the caisson, at approximately 98 feet below the exiting ground surface, and into the water-bearing formations using a hydraulic jacking tool. This tool uses hydraulic pressure to push the lateral sections into the formation using the beveled end of the first section of pipe to establish the hole. Once the laterals are established, the remaining equipment will be installed using typical construction techniques to finish the well and pump station.

Parking for maintenance vehicles will be provided adjacent to the well structure. The water system will require potable water and electrical service, as well as an emergency natural gas generator. Natural gas will be extended within West Kalama River Road south of the Steelscape facility to the well structure. Water will be extended from an existing line located to the south. Electrical services will be provided from east of the project site and will be installed underground.

The facility will be designed to handle six pumps. The initial phase will install only three pumps to handle the initial water demands of the facility. Additional pumps may be installed in the future along with facilities to handle treatment.

Temporary Crane Pad and Barge Access

It is expected that some components of the facility (e.g., boilers, ASUs, water treatment, substation, and motor control centers) will be assembled off-site and transported to the project site via barge. These modules may be offloaded from the existing Steelscape dock, or alternatively, may be offloaded directly from the barges using a temporary crane. A temporary concrete crane pad will be constructed on an upland portion of the site for offloading materials/equipment from barges. The temporary crane pad will be located in an area outside of riparian buffers and outside of the 100-year floodplain at the site (Figure 3).

Modules will be delivered to the site in self-anchoring barges, which will anchor offshore using spuds or similar temporary anchors. Barges will anchor off-shore, and will not ground out on the beach. Barges will typically only be anchored in place for approximately 1-2 days, as material is being unloaded. Once offloaded, the equipment/modules will be moved into place and erected on the site. The temporary concrete pad will be demolished and the temporary crane removed prior to project completion.

6f. What are the anticipated start and end dates for project construction? (Month/Year) [help]

- If the project will be constructed in phases or stages, use JARPA Attachment D to list the start and end dates of each phase or stage.

Start date: March 2016 End date: June 2020 ☐ See JARPA Attachment D

6g. Fair market value of the project, including materials, labor, machine rentals, etc. [help]

$1,800,000,000

6h. Will any portion of the project receive federal funding? [help]

- **If yes**, list each agency providing funds.

☒ Yes ☐ No ☐ Don't know

The project proponents may seek federal funding from a variety of sources for various portions of the project. Specific sources and agencies have not been identified.

Part 7–Wetlands: Impacts and Mitigation

☒ Check here if there are wetlands or wetland buffers on or adjacent to the project area.
(If there are none, skip to Part 8.) [help]

7a. Describe how the project has been designed to avoid and minimize adverse impacts to wetlands. [help]

☐ Not applicable

The project has been designed to avoid direct impacts to adjacent offsite wetlands completely. No wetlands are present on the portion of the site where the facility will be constructed.

The entirety of the upland area where the methanol plant and related facilities will be constructed has been used for placement of dredged material through previously permitted activities. An existing public access road isolates the plant area from the wetlands and riparian habitats to its north. Similarly, the toe of the dredged material along the shoreline isolates the plant area from the Columbia River and shoreline habitat.

Cowlitz County establishes standard wetland buffer widths, which extend outward from the wetland boundary for a distance which varies based on the adjacent land uses and wetland rating. Wetlands A and B would have base buffer widths which would extend onto portions of the project site. However, Cowlitz County Code (CCC) Section 19.15.120.C.4.a provides that, where applicable, buffers based on the standard widths are not required to extend beyond existing natural or manmade barriers, such as rock outcroppings, dikes, levees, or roads, that isolate the area from the wetland resource.

The existing roadways and dredged material placement functionally isolate most of the project site from the adjacent wetland resources. The only portion of the site that includes a functional wetland buffer is at the north end of the project site where the proposed recreation access improvements will be constructed. The proposed recreation access improvements at the north end of the project site will permanently impact approximately 3,904 square feet (0.09 acre) of wetland buffer for Wetland A.

The wetland buffer that extends onto the site consists of a stand of young black cottonwood and willow trees, with limited understory vegetation aside from Himalayan blackberry and Scotch broom. The buffer extends only a maximum of approximately 125 feet onto the project site, as it is isolated from the site by the toe of the existing dredge material and existing access roads. The buffer likely provides a moderate level of water quality and habitat functions for the adjacent wetland.

7b. Will the project impact wetlands? [help]

☐ Yes ☒ No ☐ Don't know

7c. Will the project impact wetland buffers? [help]

☒ Yes ☐ No ☐ Don't know

7d. Has a wetland delineation report been prepared? [help]

- **If Yes**, submit the report, including data sheets, with the JARPA package.

☒ Yes ☐ No

7e. Have the wetlands been rated using the Western Washington or Eastern Washington Wetland Rating System? [help]

- **If Yes**, submit the wetland rating forms and figures with the JARPA package.

☒ Yes ☐ No ☐ Don't know

7f. Have you prepared a mitigation plan to compensate for any adverse impacts to wetlands? [help]

- **If Yes**, submit the plan with the JARPA package and answer 7g.
- **If No, or Not applicable**, explain below why a mitigation plan should not be required.

☒ Yes ☐ No ☐ Not applicable

The project will not result in any wetland impacts, and no wetland mitigation is proposed. A mitigation plan has been prepared to mitigate for unavoidable impacts to aquatic resources, including riparian habitats, as well as for wetland buffer impacts. This mitigation is described in Section 8 below.

7g. Summarize what the mitigation plan is meant to accomplish, and describe how a watershed approach was used to design the plan. [help]

The purpose of the mitigation plan is to document the mitigation sequencing that was applied for the project, and to document the proposed compensatory mitigation for unavoidable impacts to aquatic resources, riparian habitats, and wetland buffers. Section 8(d) describes the site selection factors and justification.

7h. Use the table below to list the type and rating of each wetland impacted, the extent and duration of the impact, and the type and amount of mitigation proposed. Or if you are submitting a mitigation plan with a similar table, you can state (below) where we can find this information in the plan. [help]

Activity (fill, drain, excavate, flood, etc.)	Wetland Name[1]	Wetland type and rating category[2]	Impact area (sq. ft. or Acres)	Duration of impact[3]	Proposed mitigation type[4]	Wetland mitigation area (sq. ft. or acres)
N/A						

[1] If no official name for the wetland exists, create a unique name (such as "Wetland 1"). The name should be consistent with other project documents, such as a wetland delineation report.
[2] Ecology wetland category based on current Western Washington or Eastern Washington Wetland Rating System. Provide the wetland rating forms with the JARPA package.
[3] Indicate the days, months or years the wetland will be measurably impacted by the activity. Enter "permanent" if applicable.
[4] Creation (C), Re-establishment/Rehabilitation (R), Enhancement (E), Preservation (P), Mitigation Bank/In-lieu fee (B)

Page number(s) for similar information in the mitigation plan, if available: _____

7i. For all filling activities identified in 7h, describe the source and nature of the fill material, the amount in cubic yards that will be used, and how and where it will be placed into the wetland. [help]

Not applicable.

7j. For all excavating activities identified in 7h, describe the excavation method, type and amount of material in cubic yards you will remove, and where the material will be disposed. [help]

Not applicable.

Part 8–Waterbodies (other than wetlands): Impacts and Mitigation

In Part 8, "waterbodies" refers to non-wetland waterbodies. (See Part 7 for information related to wetlands.) [help]

☒ Check here if there are waterbodies on or adjacent to the project area. (If there are none, skip to Part 9.)

8a. Describe how the project is designed to avoid and minimize adverse impacts to the aquatic environment. [help]

☐ Not applicable

The project proposes a number of impact avoidance and minimization measures to avoid and minimize the potential for adverse environmental effects. General impact avoidance and minimization measures include those listed in the following paragraphs.

Marine Terminal

The project has been designed to avoid and minimize impacts to aquatic resources to the greatest extent practicable. The size and configuration of the structures have been kept to the minimum capable of supporting their needed functions. In addition, the terminal has been designed such that (with the exception of the access trestle) the platforms, dolphins, and structures associated with the terminal will be located in water deeper than 20 feet below OHWM (11.6 feet CRD). This will minimize the effects to aquatic habitats by minimizing structure in and over shallow water habitats and placing the vessels away from shallow water reducing impacts from vessel operations such as scour from prop and thrusters.

The Columbia River is a constitutionally designated area of commerce and the dock will be located in an existing harbor area and adjacent to the federal navigation channel. Ship traffic associated with the project will result in a minor increase in vessel traffic (an estimated 3 to 6 ships per month) and will be within historical levels. In addition, walkways will be grated to further minimize shading, and stormwater will be collected and infiltrated upland, reducing the potential for pollutants to reach surface waters. Furthermore, the access trestle abutments have been designed and configured to eliminate the need for shoreline armoring along the riverbank.

The dock design uses pre-cast concrete piles, rather than steel pipe piles, as structural support piles, which minimizes the potential for acoustic effects associated with impact pile driving. The steel piles for walkway supports and fender systems will be installed with a vibratory hammer, and are not expected to require impact proofing. If impact proofing is required, a bubble curtain will be employed. Stormwater from the dock will be collected and conveyed to an upland treatment and infiltration swale. The stormwater system will also accommodate stormwater from the existing Northport dock, which is currently infiltrated in an upland swale that will be removed for the development.

The proposed berth extension has been sited entirely in deep water habitat, adjacent to an existing deep water berth. Existing water depths in the proposed berth area vary from -50 feet CRD to -39 feet CRD. Locating the berth only in existing deep water, adjacent to an existing deep water berth minimizes the effects that would otherwise be associated with constructing a new berth elsewhere. No shallow water habitat would be affected by the berth extension.

Upland Facility

The upland facility has been designed to avoid and minimize impacts to all aquatic resources to the greatest extent practicable. The upland portion of the facility has been designed to entirely avoid disturbing wetlands, and would be constructed on a site that has little substantial vegetation, has been slated for industrial development for years, and has been used as a dredge material placement site.

Several projects were previously proposed for the site, and nearly all of them would have resulted in greater habitat impacts than the current proposal. Several potential projects would have required the construction of a rail loop track that in turn would have required filling a portion of the high quality forested backwater wetland area to the north of the project site. The site is well suited for use as an export facility. The proposed project has been developed within the envelope of previously developed areas at the site and will not result in any impacts to the forested backwater wetland to the north.

Stormwater from impervious surfaces associated with the proposed project will be infiltrated through on-site stormwater pond(s).

Best Management Practices

The project includes the following BMPs to minimize the extent of any effects to marine mammals or the aquatic environment.

General BMPs

General BMPs include those listed below.

- In-water work will be conducted only during the in-water work window that is ultimately approved for this project.
- Project construction will be completed in compliance with Washington State Water Quality Standards (WAC 173-201A), including those listed below.
  - Petroleum products, fresh cement, lime, concrete, chemicals, or other toxic or deleterious materials will not be allowed to enter surface waters.
  - There will be no discharge of oil, fuels, or chemicals to surface waters, or onto land where there is a potential for re-entry into surface waters.
  - Fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc., will be checked regularly for leaks, and materials will be maintained and stored properly to prevent spills.
- A spill prevention, control, and countermeasures (SPCC) plan will be prepared by the contractor and used during all demolition and construction operations. A copy of the plan with any updates will be maintained at the work site.
  - The SPCC plan will outline BMPs, responsive actions in the event of a spill or release, and notification and reporting procedures. The plan also will outline management elements such as personnel responsibilities, project site security, site inspections, and training.
  - The SPCC plan will outline the measures to prevent the release or spread of hazardous materials found on site or encountered during construction but not identified in contract documents including any hazardous materials that are stored, used, or generated on site during construction activities. These items include, but are not limited to, gasoline, diesel fuel, oils, and chemicals.
- Applicable spill response equipment and material designated in the SPCC plan will be maintained at the job site.

Overwater Work BMPs

Typical construction BMPs for working in, over, and near water will be applied; these include activities such as the following.

- Checking equipment for leaks and other problems that could result in the discharge of petroleum-based products or other material into waters of the Columbia River.
- Corrective actions will be taken in the event of any discharge of oil, fuel, or chemicals into the water. These actions will include:
  - Beginning containment and cleanup efforts immediately upon discovery of the spill and completing them in an expeditious manner in accordance with all applicable local, state, and federal regulations. Spill response will take precedence over normal work. Cleanup will include proper disposal of any spilled material and used cleanup material.
  - Ascertaining the cause of the spill and taking appropriate actions to prevent further incidents and environmental damage.
  - Reporting spills to Ecology's Northwest Regional Spill Response Office at (425) 649-7000.
- Excess or waste materials will not be disposed of or abandoned waterward of OHW or allowed to enter waters of the state. Waste materials will be disposed of in an appropriate manner consistent with applicable local, state, and federal regulations.
- Demolition and construction materials will not be stored where wave action or upland runoff can cause materials to enter surface waters.
- Oil-absorbent materials will be present on site for use in the event of a spill or if any oil product is observed in the water.

Pile Installation BMPs

Pile installation BMPS to be applied will include the following.

- A vibratory hammer will be used to drive steel piles to minimize underwater and terrestrial noise levels.

- If steel piles require impact installation or proofing, a bubble curtain will be used.
- Marine mammal monitoring will be conducted during pile installation activities to minimize impacts to marine mammals. The Applicant has applied for an Incidental Harassment Authorization (IHA) with NMFS for the unavoidable incidental harassment of marine mammals that could occur during pile installation.

Overwater Concrete Placement Minimization and BMPs

On-site concrete placement will follow appropriate BMPs that include the following.

- Wet concrete will not come into contact with surface waters.
- Forms for any concrete structure will be constructed to prevent leakage of wet concrete.
- Concrete process water will not be allowed to enter the river. Any process water/contact water will be routed to a contained area for treatment and will be disposed of at an upland location.

Dredging BMPs

- Dredging will be conducted during the in-water work window that is ultimately approved for this project.
- Dredging will be conducted to prevent impingement of juvenile salmonids by dredging equipment or clamshell or hydraulic dredge. Regular observation of sediment aboard the barge or at the placement areas will be conducted. If impingement occurs, clamshell operations will be adjusted (slowed) or modified to increase the opportunity for juveniles to avoid the bucket and/or suction head. The hydraulic dredge will be lowered deeper into the sand to reduce water entrainment.
- Construction activities will be conducted in compliance with Surface Water Quality Standards for Washington (173-201A WAC) or other conditions as specified in the water quality certification and/or construction stormwater permit.
- Appropriate BMPs will be employed to minimize sediment loss and turbidity generation during dredging. BMPs may include, but are not limited to, the following:
    - Smooth closure of the bucket when at the bottom;
    - No stockpiling of dredged material on the riverbed;
    - Maintaining suction head of hydraulic dredge in the river bed to the extent practicable;
    - Using a buffer plate or other means to reduce flow energy of the hydraulic dredge at the placement area; and
    - Other conditions as specified in the water quality certification.
- Enhanced BMPs may also be implemented and may include, but are not limited to, the following:
    - Slowing the velocity (i.e., cycle time) of the ascending loaded clamshell bucket through the water column;
    - Pausing the dredge bucket near the bottom while descending, and near the water line while ascending; and
    - Placing filter material over the barge scuppers to clear return water.
- If sediment is placed on a barge for delivery to the placement area, no spill of sediment from the barge will be allowed. The barge will be managed such that the dredged sediment load does not exceed the capacity of the barge. The load will be placed in the barge to maintain an even keel and avoid listing. Hay bales and/or filter fabric may be placed over the barge scuppers to help filter suspended sediment from the barge effluent, if needed, based on sediment testing results.

Dredge Material Placement BMPs

The following BMPs and conservation measures will be implemented to minimize environmental impacts during dredged material transport and placement:

- The contractor will be required to use a tightly sealing bucket and to monitor for spillage during transfer operations.
- Visual water quality monitoring and, if necessary, follow-up measurements will be conducted around the barge at the removal and upland transfer area to confirm that material is not being released.

- Sediment that is dredged by hydraulic dredge and placed in-water by hydraulic pipeline will be discharged at the riverbed to the extent practicable to minimize turbidity in the water column.
- Material used as beach nourishment will be placed within the limits of the boundaries and below OHWM.
- To prevent fish stranding, the slope for beach nourishment will be 3:1 horizontal to vertical (33 percent) without any swales.
- Sediment placement will use methods that minimize sediment loss and turbidity to the maximum extent possible.
- The placement activities will be monitored visually to ensure placed sediment is contained inside of the specified boundaries.
- Enhanced BMPs may be implemented to control sediment migration and turbidity and may include the following:
    - Selective sediment placement at areas with low dispersion;
    - Lowering the discharge pipeline toward the bottom elevation;
    - Placing sediment to build confinement dikes followed by placing the sediment into them; and
    - Installing a silt curtain or similar equipment where appropriate.
- If upland stockpiling of dredged material becomes necessary, BMPs will be employed as appropriate to control runoff and erosion. Such BMPs may include: 1) installing silt fences, hay bales, and/or containment berms; 2) managing runoff and elutriate water; and 3) routine inspection of the stockpile areas to verify that BMPs are functioning properly.

8b. Will your project impact a waterbody or the area around a waterbody? [help]

☒ Yes ☐ No

8c. Have you prepared a mitigation plan to compensate for the project's adverse impacts to non-wetland waterbodies? [help]

- **If Yes**, submit the plan with the JARPA package and answer 8d.
- **If No, or Not applicable,** explain below why a mitigation plan should not be required.

☒ Yes ☐ No ☐ Not applicable

A mitigation plan has been prepared and is attached.

8d. Summarize what the mitigation plan is meant to accomplish. Describe how a watershed approach was used to design the plan.

- If you already completed 7g you do not need to restate your answer here. [help]

The project has the potential to affect the suitability of aquatic habitat function locally, by increasing the quantity of nearshore overwater shading and by reducing the quantity and quality of benthic habitats. Therefore, in addition to impact avoidance and minimization, the Applicant has incorporated three categories of mitigation activities as part of the proposed action: 1) pile removal; 2) ELJ installation; and 3) riparian habitat restoration and wetland buffer enhancement. The mitigation plan is included as Appendix D of this document.

Impact Avoidance and Minimization

The project has been designed to avoid and minimize impacts to aquatic resources to the greatest extent practicable. The size and configuration of the structures have been kept to the minimum necessary to support their needed functions. In addition, the terminal has been designed such that (with the exception of the access trestle) the platforms, dolphins, and structures associated with the terminal will be located in water deeper than 20 feet below OHWM (11.6 feet CRD). This will minimize the effects to aquatic habitats by minimizing structure in and over shallow water habitats and placing the vessels away from shallow water reducing impacts from vessel operations such as scour from prop and thrusters. The proposed berth extension would also be conducted in deep water, and would not affect any shallow water habitat,

The Columbia River is a constitutionally designated area of commerce and the dock will be located in an existing harbor area and adjacent to the federal navigation channel. Ship traffic associated with the project will result in a minor increase in vessel traffic and will be within historical levels. In addition, walkways will be grated to further minimize shading, and stormwater will be collected and infiltrated upland, reducing the potential for pollutants to reach surface waters. Furthermore, the access trestle abutments have been designed and configured to eliminate the need for shoreline armoring along the riverbank.

The dock design uses pre-cast concrete piles, rather than steel pipe piles, as structural support piles, which minimizes the potential for acoustic effects associated with impact pile driving. The steel piles for walkway supports and fender systems will be installed with a vibratory hammer, and are not expected to require impact proofing. If impact proofing is required, a bubble curtain will be employed. Stormwater from the dock will be collected and conveyed to upland treatment and infiltration swale. The stormwater system will also accommodate stormwater from the existing North Port dock, which is currently infiltrated in an upland swale that will be removed for the development.

The upland facility has been designed to avoid and minimize impacts to all aquatic resources to the greatest extent practicable. The facility will be constructed on a site that has no wetlands or other waterbodies, has little substantial vegetation, has been slated for industrial development for years and has been used as a dredge material placement site.

Several projects were previously proposed for the site, and nearly all of them would have resulted in greater habitat impacts than the current proposal. The site is well suited for an export facility, and several potential projects would have required the construction of a rail loop track that in turn would have required filling a portion of the high quality forested backwater wetland area to the north of the project site. This proposed project has been developed within the envelope of previously developed areas at the site, and will not result in any impacts to the forested backwater wetland to the north.

Stormwater from impervious surfaces associated with the proposed project will be infiltrated through on-site stormwater pond(s).

Impacts Summary
Aquatic Impacts

In total, the proposed terminal will require the installation of approximately 320, 24-inch concrete piles; 12, 12-inch steel pipe piles; and 4, 18-inch steel pipe piles. This represents a total of approximately 1,079 square feet of new benthic impact associated with new pile footprints. The new marine terminal itself will result in a total of approximately 44,943 square feet of new solid overwater coverage.

With the single exception of a portion of the access trestle, the design of the terminal locates the platforms, dolphins, and structures in water deeper than 20 feet below OHWM (11.6 feet CRD). This minimizes the effects to aquatic habitats by locating most of the dock terminal in deep water and minimizing structure in and over shallow water habitats.

Of the total new aquatic habitat impact, approximately 34,018 square feet of overwater coverage, and approximately 906 square feet of new benthic impact associated with new pile footprints, will be located in water deeper than 20 feet below OHWM. Approximately 10,925 square feet of new overwater coverage associated with the access trestle, and a total of approximately 173 square feet of new benthic impact associated with new pile footprints for the access trestle, will occur in and over shallow water habitat (water shallower than 20 feet below OHWM).

Proposed dredging activities associated with the berth extension will occur in deep water, and are not expected to result in habitat impacts greater than those resulting from naturally recurring hydraulic action, and no compensatory mitigation is proposed for temporary effects to benthic habitats associated with berth dredging.

Riparian Habitat Area Impacts

Cowlitz County has established riparian habitat areas (RHAs) adjacent to certain rivers and streams, and regulates these RHAs as critical areas under the County's critical areas ordinance (Cowlitz County Code [CCC] 19.15).

RHAs are established for habitats that include terrestrial and aquatic ecosystems that influence or benefit each other and are located adjacent to rivers or perennial or intermittent streams (Section 19.15.130.E.3). The Columbia River is classified as a Type S Water of the State, and the ordinance provides it with a 150-foot RHA buffer (measured from the OHWM). Within this RHA are an inner and outer zone, each 75 feet in width.

The ordinance, however, also states: "where an existing natural or manmade barrier isolates a riparian area, that area is not within any 100-year floodplain, and a qualified professional demonstrates that the isolated area does not provide shade, fine or large woody material, nutrients, organic and inorganic debris, terrestrial insects, or habitat for riparian-associated wildlife, the standard RHA widths may not apply at the discretion of the Director."

The entirety of the site is located where dredge material has been placed through previously permitted activities. A public access road isolates the site from the wetlands and riparian habitats to its north. Similarly, the toe of the dredge material along the shoreline isolates the site from the Columbia River and shoreline habitat. However, a portion of the project will be conducted on portions of this former dredge material placement area that are below the 100-year floodplain. For this reason, these portions of the site that are below the 100-year floodplain and also within 150 feet of the OHWM will still be subject to RHAs. In portions of the site where historic dredge material placement has elevated the site above the 100-year floodplain, the RHA and shoreline buffers do not extend onto the site beyond the existing toe of the dredge placement prism and public access road (Figure 10).

In total, the project will result in direct permanent impacts to approximately 33,627 square feet (0.77 acre) of RHA buffer. This includes approximately 2,425 sf (0.06 acre) associated with the construction of the dock trestle, approximately 27,874 sf (0.64 acre) associated with the construction of the improved recreational access, and approximately 3,328 sf (0.08 acre) associated with an infiltration pond at the north end of the site.

Wetland Buffer Impacts

As described in Section 7a, the proposed recreation access improvements at the north end of the project site will permanently impact approximately 3,904 square feet (0.09 acre) of wetland buffer for Wetland A. The portion of the wetland buffer that will be impacted is within a moderately functioning portion of the buffer, consisting of black cottonwood and willows intermixed with Himalayan blackberry and Scotch broom growing on dredge sands.

Compensatory Mitigation

Pile Removal

The Applicant will remove portions of two rows of existing timber piles now located in the freshwater intertidal backwater channel portion of the project site on Port property. These piles are estimated to range between 12 and 14 inches in diameter at the mudline. A total of approximately 320 piles will be removed from the two structures.

The piles result in the direct loss of benthic habitat and serve to reduce the quality of the habitat in the area. The tight spacing of the piles serve to reduce the flow in and out of approximately 13 acres of the backwater channel. Field observations and aerial photographic interpretation document a buildup of sediment on the upstream side of the pile structures resulting in an acceleration of sedimentation in the channel and reducing flows. The piles serve as habitat for non-native species including fish and bird species that prey on native salmonids and some of the piles may be a source of pollutants from chemicals used for treatment.

Removal of these piles will restore a minimum of 251 square feet of benthic habitat within an area approximately 0.73 acre in size. These structures, in their current configuration, affect the movement of water and sediment into and out of approximately 13 acres of this backwater area. The removal of the piles will facilitate sediment transport and seasonal flushing of this backwater area. The backwater wetland is currently accreting sediment, and removal of the piles will both improve water quality and also help to maintain this area as an off-channel refuge for juvenile salmonids in the long term.

The interior pile structure would only be partially removed, per a recommendation by WDFW, to allow for some of the untreated piles to remain as vertical structure, while still providing for the sediment transport and associated water quality and habitat improvement benefits. Pile removals will provide both in-kind mitigation for benthic habitat impacts associated with new piling, as well as out-of-kind habitat mitigation in the form of sediment transport and water quality habitat improvement.

Engineered Log Jam Installation

In addition to the proposed pile removals, the Applicant will install eight ELJs along the nearshore habitat along the Columbia River shoreline adjacent to the site. ELJs are a restoration and mitigation method that helps build high quality fish habitat, develops scour pools, and provides complex cover (S.P. Cramer 2012).

Each ELJ will measure approximately 20 by 20 feet and be composed of large-diameter untreated logs, logs with rootwads attached, small wood debris, and boulders. Logs generally will have a minimum diameter of 12 inches and be 20 feet long. They will be anchored to untreated wood piles driven a minimum of 20 feet into the stream bed and will be fastened to the piles by drilling holes in the wood and inserting 1-inch through-bolts for attaching chains to secure the wood to the piles. The logs that comprise the structure will be further bolted together to create a complex crib structure with 2- to 3-inch interstitial spaces. These spaces may be filled with smaller wood debris and/or boulders to enhance structural complexity and capture free-floating wood from the Columbia River.

These large wood structures will increase complex in-stream and overhead cover with interstitial spaces that will allow juvenile and adult salmonids to evade predation by marine mammals, birds, and fish. Each ELJ will be a minimum of approximately 400 square feet in size, and the eight structures will represent a total of 3,200 square feet of new large woody material, installed along approximately 800 linear feet of Columbia River shoreline. The log jams will provide refuge and foraging opportunities for outmigrating juvenile salmonids. ELJs will provide high quality out of kind mitigation for impacts associated with new overwater cover as well as additional mitigation for benthic impacts of proposed pile footprints.

Riparian Restoration and Wetland Buffer Enhancement

To further enhance riparian and shoreline habitat at the project site, the Applicant also proposes to conduct riparian enhancement and invasive species management within an area approximately 1.41 acres in size along the Columbia River shoreline at the site. Similarly, the Applicant proposes to enhance approximately 0.58 acre of wetland buffer at the north end of the site to offset unavoidable wetland buffer impacts. The riparian and wetland buffer habitats will be enhanced by removing invasive species and installing native trees and shrubs that are common to this reach of the Columbia River shoreline and adjacent wetlands. The restoration site will be monitored and maintained for 5 years to document proper site establishment.

Native plantings proposed for the site include black cottonwood and a mix of native willow species including Columbia River willow, Pacific willow, and Sitka willow. These species are common to the sandy riparian habitats and adjacent wetlands in this reach of the river. Plants will be installed as cuttings (6-foot whips) or bare-root stock to promote the establishment of deep root systems, as a means of combatting dry summer conditions and potential herbivory by native wildlife species including beaver, which are active in this reach of the river.

The table below identifies the planting plan for the riparian restoration and wetland buffer enhancements. The portion of the riparian enhancement site further from the dock (Plant Community A) will be planted

with both trees and shrubs, whereas the portion of the site closest to the dock (Plant Community B) will be planted with shrubs only for security, visibility, and safety concerns.

Table 2. Planting Plan

Species	Plant Form	Min. Height at Planting	Recommended Spacing	Required Number
Plant Community A				
Black cottonwood (*Populus balsamifera*	Bare root or 3/4-inch diameter live stake	36 inches	10 feet on center	350
Columbia River willow (*Salix fluviatillis*)	Bare root or 3/4-inch diameter live stake	36 inches	5 feet on center	250
Pacific willow (*Salix lasiandra*)	Bare root or 3/4-inch diameter live stake	36 inches	5 feet on center	250
Sitka willow (*Salix sitchensis*)	Bare root or 3/4-inch diameter live stake	36 inches	5 feet on center	250
			Subtotal	1,100
Plant Community B				
Columbia River willow (*Salix fluviatillis*)	Bare root or 3/4-inch diameter live stake	36 inches	5 feet on center	500
Pacific willow (*Salix lasiandra*)	Bare root or 3/4-inch diameter live stake	36 inches	5 feet on center	500
Sitka willow (*Salix sitchensis*)	Bare root or 3/4-inch diameter live stake	36 inches	5 feet on center	500
			Subtotal	1,500
Plant Community C				
Black cottonwood (*Populus balsamifera)*	Bare root or 3/4-inch diameter live stake	36 inches	10 feet on center	150
			Subtotal	150
			Total	2,750

Invasive species management at the site will target locally common and aggressive invasive weed species, primarily Scotch broom and Himalayan blackberry. Weeds will be controlled by annual manual removal (hand pulling, cutting, and/or mowing). Appropriate herbicide treatments may also be applied if determined necessary by the Applicant. The invasive species management strategy will be an informal and evolving program, with the intent of limiting the spread of invasive species at the site. The details of the management program, including target species, frequency of removal activities, and specific treatments, will likely change and evolve over time as the site is managed. The proposed invasive species management will limit the spread of these aggressive species, allowing native species assemblages to develop and thrive at the site, thereby enhancing the existing riparian environment.

The proposed riparian restoration will improve both terrestrial and aquatic habitats by providing a biologically productive riparian habitat that will be a source of insect and invertebrate fauna, leaf litter, detritus, and woody debris to the aquatic system. The riparian enhancements will also provide natural streambank stability, minimizing bank erosion and sedimentation. The establishment of native vegetation will improve habitat suitability for native birds and other terrestrial species that rely on these riparian habitats.

Riparian restoration activities will provide both in-kind mitigation (for riparian buffer impacts) as well as out-of-kind habitat enhancements to nearshore aquatic habitat (for new overwater structure and benthic habitat impacts).

The proposed wetland buffer plantings and invasive species management will enhance the condition of the wetland buffer to offset wetland buffer impacts associated with the proposed recreation access improvements. The proposed plantings will replace native vegetation that is impacted as a result of the project, and will help establish a forest canopy where none currently exists. The proposed invasive

species management will improve the habitat conditions within the buffer, and minimize the spread of aggressive species that could otherwise affect the quality of the adjacent wetland. The wetland buffer enhancements will provide direct on-site in-kind mitigation for wetland buffer impacts associated with the proposed recreation access improvements.

Site Selection Factors and Justification

In selecting the proposed mitigation activities and locations, the following documents were used as references.

- USACE, Compensatory Mitigation for Losses of Aquatic Resources Final Rule, 33 CFR Part 332, 2008
- Ecology, "Wetland Mitigation in Washington State – Part 1 Agency Policies and Guidance" and "Part 2: Developing Mitigation Plans (Version 1)," 2006
- Ecology, "Selecting Mitigation Sites Using a Watershed Approach," 2009

Section 332.3(b) of the USACE final rule (US Army Corps of Engineers 2008) prioritizes the use of mitigation bank credits, or in lieu fee program credits, when available. There are currently no established mitigation banks or approved in-lieu fee mitigation programs in place with credits available to address the aquatic and terrestrial habitat impacts that will result from this project. In instances where mitigation bank credits or in lieu fee program credits are not available, the final rule recommends permittee-responsible mitigation using a watershed approach, as the preferred approach. The Lower Columbia Fish Recovery Board (LCFRB) has published a watershed plan for the Lower Columbia River mainstem, which includes the waters of the Lower Columbia River where this project will occur. The mitigation actions proposed in this plan have been developed consistent with the LCFRB watershed plan, and consistent with the watershed approach guidance described in the final mitigation rule.

The proposed mitigation includes a combination of on-site, in-kind replacement of impacted aquatic habitat functions (pile removal), and on-site, out-of-kind enhancements to nearshore and riparian habitats at the site. All of the proposed mitigation activities that are proposed will be conducted within and adjacent to waters of the Columbia River in the vicinity of the project activities, and will directly benefit the aquatic, riparian, and adjacent wetland habitats where project activities are being conducted.

The piles proposed for removal are old timber structures, representing approximately 251 square feet of existing benthic habitat impact. The locations of these piles in the adjacent backwater habitat are proximal to the areas where benthic habitat impacts associated with the project will occur. As such, the proposed pile removal activities at these locations will benefit aquatic habitat conditions in the vicinity of the project site directly. The removal of these piles will restore benthic habitat in the backwater and improve hydraulics and sediment transport within approximately 13 acres of backwater habitat, thereby enhancing fish access within an important area of backwater habitat that provides refugia for outmigrating and wintering juvenile salmonids. The pile removals will offset the shallow water benthic habitat impacts at a ratio of greater than 1:1. Additionally, the ratio of piles removed to newly installed piles will be 1:1. The supplemental habitat improvements in the backwater wetland will provide additional out-of-kind mitigation for habitat impacts associated with new overwater structures.

The ELJs installed along the shoreline will increase aquatic habitat complexity in a reach of the river that is largely lacking in large woody debris and nearshore aquatic habitat structure. The ELJs will provide in-stream habitat complexity with interstitial spaces that will allow juvenile and adult salmonids to evade predation. Each ELJ will be a minimum of approximately 400 square feet in size, and the eight structures will represent a total of 3,200 square feet of new large woody material, installed along approximately 800 linear feet of Columbia River shoreline. The log jams will provide refuge and foraging opportunities for juvenile and adult salmon, particularly for small outmigrant fish moving downstream during the spring and early summer peak of outmigration activity. ELJs, in conjunction with proposed riparian plantings, will also provide a natural form of bank stabilization and will protect adjacent beaches from erosion. ELJs will provide high quality out of kind mitigation for impacts associated with new overwater cover as well as

additional mitigation for benthic impacts of proposed pile footprints. ELJs are a commonly employed restoration technique on the Lower Columbia River and elsewhere to improve nearshore aquatic habitat function and complexity. A recently permitted project for a new spud barge approximately 8 miles upstream of the project site installed 4 similar ELJ structures as compensatory mitigation. The four structures were installed to offset approximately 160,000 sf of new overwater coverage (a ratio of one structure to 40,000 sf of new overwater coverage). The 8 ELJs proposed for this project will offset overwater coverage at a ratio of one structure to approximately 5,618 sf of overwater coverage.

The proposed 1.41 acres of riparian restoration activities will restore a more highly functioning riparian condition, which in turn will improve aquatic and riparian habitat function at the site by providing a natural source of leaf litter and woody debris and insect and invertebrate fauna. These improvements, in conjunction with the proposed ELJs, will also serve to naturally stabilize the bank and protect the adjacent beach form erosion. Riparian restoration activities will offset the 0.77 acre of RHA impact associated with the project at an acreage ratio of nearly 2:1. The proposed restoration will also result in a higher functioning riparian buffer than the portions of riparian buffer that will be impacted, and will also serve as supplemental out-of-kind mitigation for overwater structure and benthic habitat impacts.

The proposed 0.58 acre of wetland buffer enhancement will offset the 0.09 acre of wetland buffer impact at a ratio of greater than 6:1. Wetland buffer enhancement will replace native vegetation that is impacted as a result of the proposed recreation access improvements, and will help establish a forest canopy where none currently exists. The proposed invasive species management will improve the habitat conditions within the buffer, and minimize the spread of aggressive species that could otherwise affect the quality of the adjacent wetland.

8e. Summarize impact(s) to each waterbody in the table below. [help]

Activity (clear, dredge, fill, pile drive, etc.)	Waterbody name[1]	Impact location[2]	Duration of impact[3]	Amount of material (cy) to be placed in or removed from waterbody	Area (sf or linear ft.) of waterbody directly affected
Dredging	Columbia River	In-water	Temporary	126,000 cy removed	705,672 sf (16.2 acres)
Pile Placement	Columbia River	In-water	Permanent	Not Applicable	1,079 sf
Overwater Structures (solid)	Columbia River	Overwater	Permanent	Not Applicable	44,943 sf
Overwater Structures (grated)	Columbia River	Overwater	Permanent	Not Applicable	1,588 sf

[1] If no official name for the waterbody exists, create a unique name (such as "Stream 1") The name should be consistent with other documents provided.
[2] Indicate whether the impact will occur in or adjacent to the waterbody. If adjacent, provide the distance between the impact and the waterbody and indicate whether the impact will occur within the 100-year flood plain.
[3] Indicate the days, months or years the waterbody will be measurably impacted by the work. Enter "permanent" if applicable.

8f. For all activities identified in 8e, describe the source and nature of the fill material, amount (in cubic yards) you will use, and how and where it will be placed into the waterbody. [help]

The project will not place any fill in any waterbody.

8g. For all excavating or dredging activities identified in 8e, describe the method for excavating or dredging, type and amount of material you will remove, and where the material will be disposed. [help]

Dredging operations may be conducted using mechanical (clamshell) or hydraulic dredging methods, depending on various factors including volume, distance to permitted placement sites (per NWP-1994-462-1), contractor preference, and/or the need for material for future upland projects at the Port.

A hydraulic dredge uses a cutter head on the end of an arm that is buried typically 3 to 6 feet deep in the river bottom and swings in a 250- to 300-foot arc in front of the dredge. Dredge material is sucked up through the cutter head and the pipes, and deposited via pipeline to the placement areas. The hydraulic dredge will also be used for placement of dredge material in the flow-lane, as beach nourishment, or at approved upland sites.

A mechanical dredge removes material by scooping it up with a bucket. Mechanical dredges include clamshell, dragline, and backhoe dredges. Mechanical dredging is performed using a bucket operated from a crane or derrick that is mounted on a barge or operated from shore. Sediment from the bucket is usually placed directly in an upland area or on a scow or bottom dump (split) barge. Placement of the material occurs through opening the bottom doors or splitting the barge. In this case, the process of splitting will be tightly controlled to minimize turbidity and the spread of material outside the placement area.

Upland placement will likely be completed through the use of a hydraulic pipeline. In this method, dredged material is pumped as a slurry through a pipeline that floats on the water using pontoons, is submerged, or runs across dry land. Dredged material transported by hydraulic pipeline to an upland management site must be dewatered prior to final placement or rehandling. In this case, dewatering generally will be accomplished using settling ponds or overland flow. Settling ponds are sized based on the settling characteristics of the dredged material and the rate of dredging. Water from the sediments will be either infiltrated to the ground or will be discharged to the river through weirs already constructed at the disposal sites.

Dredged material will be placed upland at the project site to provide material for construction or for other uses, or it may be placed at existing authorized in-water and upland placement sites. The existing authorized (NWP-1994-462-1) in-water placement locations include: 1) flow lane placement to restore sediment at a deep scour hole associated with pile dike 77.48 M located on the Oregon side of the river; 2) flow lane placement to restore sediment at a deep scour hole associated with pile dike 75.63 M located on the Washington side of the river; 3) beach nourishment at the Port's shoreline park (Louis Rasmussen Park) at RM 76; and 4) the Ross Island Sand and Gravel disposal site in Portland, Oregon. The existing authorized upland disposal sites include the South Port site located north of the CHS/TEMCO grain terminal at approximately RM 77 and the project site. Additional in-water and upland sites may be identified and permitted for dredge material placement in the future.

Dredging activities will be conducted between August 1 and December 31. , during the work window approved for the project

Part 9–Additional Information

Any additional information you can provide helps the reviewer(s) understand your project. Complete as much of this section as you can. It is ok if you cannot answer a question.

9a. If you have already worked with any government agencies on this project, list them below. [help]

Agency Name	Contact Name	Phone	Most Recent Date of Contact
Cowlitz County	Ron Melin, Charlie Duncan	360-577-3052	11 December 2014
Cowlitz County	Patrick Harbison	360-577-3052	12 March 2015
DNR	Don Olmstead	360-902-1100	25 November 2014
Dept. of Homeland Security	Tracie Hanson	202-617-1131	7 January 2015
Ecology	Alan Bogner	360-407-7188	14 November 2014
Ecology	Lori Kingsbury	360-407-6926	14 November 2014
Ecology	Rebecca Rothwell	360-407-7273	14 November 2014
Ecology	Kerry Carroll	360-407-7503	18 August 2015
Ecology	Ron Holcomb	360-407-6974	9 February 2015
USACE	Melody White	503-808-4385	3 August 2015
USACE	Mike Turaski	503-808-4381	30 January 2015
USACE	Bill Abadie	503-808-4732	1 December 2014
USCG	Ken Lawrenson	503-240-9310	22 December 2014
USFWS	Martha Jensen	360-753-9000	19 December 2014
USFWS	Lindsy Wright	360-753-6037	19 December 2014
USFWS	Shandra O'Haleck	206-753-9533	6 August 2015
NOAA	Jeff Fisher	360-534-9342	31 March 2015
WDFW	Steve West	360-906-6720	17 August 2015
WA Governor's Office for Regulatory Innovation and Assistance (ORIA)	Jesus Sanchez, Kelly Craig, Kris Kernan	800-917-0043	14 November 2014

9b. Are any of the wetlands or waterbodies identified in Part 7 or Part 8 of this JARPA on the Washington Department of Ecology's 303(d) List? [help]

- **If Yes,** list the parameter(s) below.
- If you don't know, use Washington Department of Ecology's Water Quality Assessment tools at: http://www.ecy.wa.gov/programs/wq/303d/.

☒ Yes ☐ No

The portion of the Columbia River in which the new marine terminal will be constructed is not identified on the currently approved 303(d) list (2012). The portion of the Columbia River that is adjacent to the northern

end of the project site, including a portion of Carroll's Channel and the backwater wetland (Wetland A), is listed on the 303(d) list (listing ID #21538) for temperature exceedances. This listing is based on a study conducted in 2002 and 2003 that indicated exceedances of the numeric temperature criteria of 20°C at RM 71.9.

9c. What U.S. Geological Survey Hydrological Unit Code (HUC) is the project in? [help]

- Go to http://cfpub.epa.gov/surf/locate/index.cfm to help identify the HUC.

17080003 – Lower Columbia – Clatskanie Watershed

9d. What Water Resource Inventory Area Number (WRIA #) is the project in? [help]

- Go to http://www.ecy.wa.gov/services/gis/maps/wria/wria.htm to find the WRIA #.

WRIA #27 (Lewis)

9e. Will the in-water construction work comply with the State of Washington water quality standards for turbidity? [help]

- Go to http://www.ecy.wa.gov/programs/wq/swqs/criteria.html for the standards.

☒ Yes ☐ No ☐ Not applicable

9f. If the project is within the jurisdiction of the Shoreline Management Act, what is the local shoreline environment designation? [help]

- If you don't know, contact the local planning department.
- For more information, go to: http://www.ecy.wa.gov/programs/sea/sma/laws_rules/173-26/211_designations.html.

☐ Rural ☒ Urban ☐ Natural ☐ Aquatic ☒ Conservancy ☐ Other _____

9g. What is the Washington Department of Natural Resources Water Type? [help]

- Go to http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx for the Forest Practices Water Typing System.

☒ Shoreline ☐ Fish ☐ Non-Fish Perennial ☐ Non-Fish Seasonal

9h. Will this project be designed to meet the Washington Department of Ecology's most current stormwater manual? [help]

- **If No**, provide the name of the manual your project is designed to meet.

☒ Yes ☐ No

9i. Does the project site have known contaminated sediment? [help]

- **If Yes**, please describe below.

☐ Yes ☒ No

Contaminated sediment is not known to be present at the project site or the adjacent North Port berth.

Sediment at the project site has been characterized in coordination with PSET regulatory agencies and in accordance with current SEF protocols. Sediment was characterized at the south adjacent property to the project site (the Port of Kalama North Port facility) in 2007 and 2013. The results from the 2007, 2013, and 2015 sediment characterizations, are discussed below.

2007 Sediment Characterization

Northern Resources Consulting Inc. collected sediment samples from the North Port facility in 2007. One sediment sample from North Port had a detected concentration of copper that was greater than the NOAA SQuiRT thresholds effects level of 18.2 milligram per kilogram (mg/kg). The Portland Project Review

Group determined that the sediment characterization data for North Port met SEF guidance and was approved for in-water or upland disposal.

2013 Sediment Characterization

Two surface grab samples were collected to characterize dredged material for maintenance dredging at the North Port facility in 2013. The characterized material is adjacent to the proposed terminal berth area. The sampling was conducted to support programmatic permitting for maintenance dredging at four Port facilities. The PSET approved the material for in-water disposal, upland disposal, and/or beneficial use.

2015 Sediment Characterization

Sediment sampling was conducted in February 2015 to support the characterization of dredged material disposal, for anti-degradation evaluation, and the permitting process for the proposed project. Sediment samples were collected using a powergrab sampler from a vessel outfitted for that purpose. The samples were used to characterize the sediment for the proposed dredging. Sediment characterization is being coordinated with the PSET regulatory agencies and completed in accordance with current SEF protocols. A dredge material characterization report was completed and submitted to PSET in March 2015 (Appendix C). Results indicate that the sediment samples did not exceed the sediment quality guidelines and, as such, the material proposed for dredging and placement will be suitable for placement at any of the existing Port disposal sites (including in-water and upland placement sites) and on the upland portion of the project site.

9j. If you know what the property was used for in the past, describe below. [help]

The property has been used for dredged material placement and management in the past.

9k. Has a cultural resource (archaeological) survey been performed on the project area? [help]

- **If Yes**, attach it to your JARPA package.

☒ Yes ☐ No

9l. Name each species listed under the federal Endangered Species Act that occurs in the vicinity of the project area or might be affected by the proposed work. [help]

Species Name			ESA Listing Status	Critical Habitat
Common Name	**Scientific Name**	**ESU or DPS***		
Chinook Salmon	*(Oncorhynchus tshawytscha)*	Lower Columbia River ESU	Threatened	Designated
		Upper Willamette River ESU	Threatened	Designated
		Upper Columbia River spring-run ESU	Endangered	Designated
		Snake River spring/ summer-run ESU	Threatened	Designated
		Snake River fall-run ESU	Threatened	Designated
Chum Salmon	*(Oncorhynchus keta)*	Columbia River ESU	Threatened	Designated
Coho Salmon	*(Oncorhynchus kisutch)*	Lower Columbia River ESU	Threatened	Proposed
Sockeye Salmon	*(Oncorhynchus nerka)*	Snake River ESU	Endangered	Designated
Steelhead	*(Oncorhynchus mykiss)*	Lower Columbia River DPS	Threatened	Designated
		Upper Willamette River DPS	Threatened	Designated
		Middle Columbia River DPS	Threatened	Designated
		Upper Columbia River DPS	Endangered	Designated
		Snake River Basin DPS	Threatened	Designated
Bull Trout	*(Salvelinus confluentus)*	Columbia River DPS	Threatened	Designated
Pacific Eulachon (Smelt)	*(Thaleichthys pacificus)*	Southern DPS	Threatened	Designated

North American Green Sturgeon	*(Acipenser medirostris)*	Southern DPS	Threatened	Designated
Streaked Horned Lark	*(Eremophila alpestris strigata)*	Columbia River DPS	Threatened	Designated
Columbian White-tailed Deer	*(Odocoileus virginianus leucurus)*	N/A	Endangered	Not designated or proposed

*ESU =Evolutionarily Significant Unit and DPS=Distinct Population Segment

The biological assessment prepared for this project is included as Appendix E.

9m. Name each species or habitat on the Washington Department of Fish and Wildlife's Priority Habitats and Species List that might be affected by the proposed work. [help]

The Columbia River, a Type 1 water/Type S shoreline of the state, supports resident and anadromous fish species. Within the project vicinity, WDFW has designated riparian priority habitat under its Priority Habitat and Species (PHS) program. The designated area includes the Columbia River and land adjacent to the river.

WDFW recognizes priority habitats as having unique or significant value to many species requiring protective measures and/or management guidelines to ensure their perpetuation (Knutson and Naef 1997). Federal listed, proposed for listed, and/or WDFW priority fish that occur in the Columbia River include Chinook, chum, coho, sockeye salmon, eulachon/smelt, bull trout, steelhead trout, resident/searun cutthroat trout (*O. clarki clarki*), white (*Acipenser transmontanus*) and green sturgeon, and Pacific (*Lampetra tridentata*) and river lamprey (*L. ayresi*). Priority mammals that occur in the river include Steller sea lions (*Eumatopius jubatus*), California sea lions (*Zalophus californianus*), and harbor seals (*Phoca vitulina*). No other non-fish priority species are mapped within the area of the project by WDFW. Streaked horned lark is a federally listed species under the ESA, a state endangered species, and a priority species. Streaked horned lark have been previously documented at the site, and approximately 3 acres of the northern portion of the site are considered to currently represent potentially suitable nesting habitat for streaked horned lark but are not designated critical habitat. The USFWS has determined that the site will be unsuitable following the 2015 nesting season because of natural vegetation succession at the site.

Osprey (*Pandion haliaetus*) are not considered a priority species by WDFW, but are considered a state-monitored species. There are seasonally active osprey nests along the Port's shoreline, and the project will relocate an artificial osprey nesting structure that is currently located at the site., but which has been unused by osprey

The southwestern corner of a management buffer for northern spotted owl (*Strix occidentalis caurina*) extends onto the eastern portion of the project site. However, northern spotted owls are not identified as occurring in or near the vicinity, and there is no suitable habitat for spotted owls in the vicinity. Spotted owls will not be affected by the proposed project.

Riparian habitats associated with the Columbia River and the associated backwater wetland (Wetland A) are considered priority habitats by WDFW. The extent to which functional riparian habitat extends onto the project site is limited, however. The County, in its critical areas ordinance (CCC Section 19.15), provides a 150-foot riparian habitat area (RHA) buffer from the OHWM of shorelines of the state. However, the ordinance also states: "where an existing natural or manmade barrier isolates a riparian area, that area is not within any 100-year floodplain, and a qualified professional demonstrates that the isolated area does not provide shade, fine or large woody material, nutrients, organic and inorganic debris, terrestrial insects, or habitat for riparian-associated wildlife, the standard RHA widths may not apply at the discretion of the Director." The entirety of the site is located where dredge material has been placed through previously permitted activities. A public access road isolates the site from the wetlands and riparian habitats to its north. Similarly, the toe of the dredge material along the shoreline isolates the site from the Columbia River and shoreline habitat. However, a portion of the project will be conducted on portions of this former dredge material placement area that are below the 100-year floodplain. For this reason, these portions of the site that are below the 100-year floodplain and also within 150 feet of the OHWM will still be subject to RHAs. In portions of the site where dredge material placement has elevated the site above the 100-year floodplain, the RHA and shoreline buffers do not extend onto the site beyond the existing toe of the dredge

placement prism and public access road. In total, the project will result in direct permanent impacts to approximately 33,627 square feet (0.77 acre) of RHA buffer. This includes approximately 2,425 sf (0.06 acre) associated with the construction of the dock trestle, approximately 27,874 sf (0.64 acre) associated with the construction of the improved recreational access, and approximately 3,328 sf (0.08 acre) associated with an infiltration pond at the north end of the site.

Similarly, WDFW PHS data identifies freshwater intertidal habitat and aquatic palustrine habitat on portions of the site, but these are not representative of the actual conditions at the site. The entire upland portion of the site consists of previously placed dredged materials, and there are no aquatic or wetland habitats on the portion of the site where the upland facility will be constructed. Aquatic habitats are limited to the Columbia River and the adjacent wetlands (Wetland A and Wetland B) identified in the wetland delineation (Ecological Land Services 2014). As described in Section 7A, the proposed recreation access improvements at the north end of the project site will permanently impact approximately 3,904 square feet (0.09 acre) of wetland buffer for Wetland A. The portion of the wetland buffer that will be impacted is within a moderately functioning portion of the buffer, consisting of black cottonwood and willows intermixed with Himalayan blackberry and Scotch broom growing on dredge sands.

Part 10–SEPA Compliance and Permits

Use the resources and checklist below to identify the permits you are applying for.

- Online Project Questionnaire at http://apps.ecy.wa.gov/opas/.
- Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043 or help@ora.wa.gov.
- For a list of addresses to send your JARPA to, click on agency addresses for completed JARPA.

10a. Compliance with the State Environmental Policy Act (SEPA). (Check all that apply.) [help]

- For more information about SEPA, go to www.ecy.wa.gov/programs/sea/sepa/e-review.html.

☒ A copy of the SEPA determination or letter of exemption is included with this application.
An EIS is being prepared and it is expected to be complete by mid-2016.

☐ A SEPA determination is pending with _____ (lead agency). The expected decision date is_____.

☐ I am applying for a Fish Habitat Enhancement Exemption. (Check the box below in 10b.) [help]

☐ This project is exempt (choose type of exemption below).

☐ Categorical Exemption. Under what section of the SEPA administrative code (WAC) is it exempt?

_____

☐ Other: _____

☐ SEPA is pre-empted by federal law.

10b. Indicate the permits you are applying for. (Check all that apply.) [help]

LOCAL GOVERNMENT

Local Government Shoreline permits:

☒ Substantial Development ☒ Conditional Use ☐ Variance

☐ Shoreline Exemption Type (explain): _____

Other City/County permits:

☒ Floodplain Development Permit ☒ Critical Areas Ordinance

STATE GOVERNMENT

Washington Department of Fish and Wildlife:

☒ Hydraulic Project Approval (HPA) ☐ Fish Habitat Enhancement Exemption – Attach Exemption Form

Effective July 10, 2012, you must submit a check for $150 to Washington Department of Fish and Wildlife, unless your project qualifies for an exemption or alternative payment method below. **Do not send cash.**

Check the appropriate boxes:

☒ $150 check enclosed. Check # _____
Attach check made payable to Washington Department of Fish and Wildlife.

☐ My project is exempt from the application fee. (Check appropriate exemption)_____
- ☐ HPA processing is conducted by applicant-funded WDFW staff.
  Agreement # _____
- ☐ Mineral prospecting and mining.
- ☐ Project occurs on farm and agricultural land.
  (Attach a copy of current land use classification recorded with the county auditor, or other proof of current land use.)
- ☐ Project is a modification of an existing HPA originally applied for, prior to July 10, 2012.
  HPA # _____

Washington Department of Natural Resources:

☐ Aquatic Use Authorization

Complete JARPA Attachment E and submit a check for $25 payable to the Washington Department of Natural Resources. **Do not send cash.**

Washington Department of Ecology:

☒ Section 401 Water Quality Certification

FEDERAL GOVERNMENT

United States Department of the Army permits (U.S. Army Corps of Engineers):

☒ Section 404 (discharges into waters of the U.S.) ☒ Section 10 (work in navigable waters)

Nationwide #6

United States Coast Guard permits:

☒ Private Aids to Navigation (for non-bridge projects)

Part 11–Authorizing Signatures

Signatures are required before submitting the JARPA package. The JARPA package includes the JARPA form, project plans, photos, etc. [help]

11a. Applicant Signature (required) [help]

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities, and I agree to start work only after I have received all necessary permits.

I hereby authorize the agent named in Part 3 of this application to act on my behalf in matters related to this application. TR (initial)

By initialing here, I state that I have the authority to grant access to the property. I also give my consent to the permitting agencies entering the property where the project is located to inspect the project site or any work related to the project. TR (initial)

Tabitha Reeder		8/27/15
Applicant Printed Name	Applicant Signature	Date

11b. Authorized Agent Signature [help]

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities and I agree to start work only after all necessary permits have been issued.

Dan Gunderson		8/27/15
Authorized Agent Printed Name	Authorized Agent Signature	Date

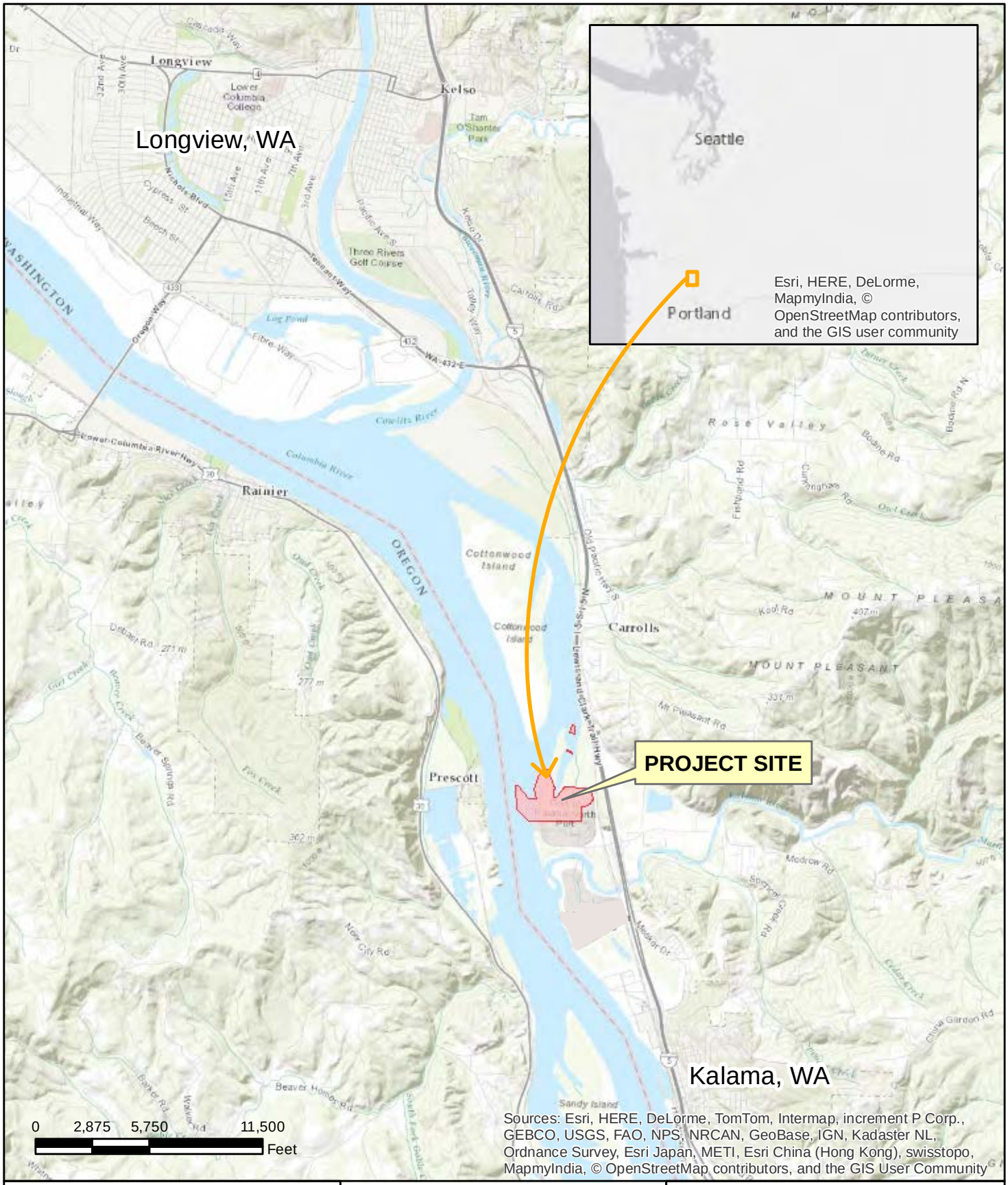
11c. Property Owner Signature (if not applicant) [help]
Not required if project is on existing rights-of-way or easements.

I consent to the permitting agencies entering the property where the project is located to inspect the project site or any work. These inspections shall occur at reasonable times and, if practical, with prior notice to the landowner.

Property Owner Printed Name	Property Owner Signature	Date

18 U.S.C §1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than 5 years or both.

If you require this document in another format, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at (800) 917-0043. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341. ORIA publication number: ENV-019-09 rev. 08/2013



PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River
COUNTY OF: Cowlitz County
STATE OF: WA
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 1: VICINITY MAP

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, Wa. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
OHWM (USACE)= +11.6' CRD

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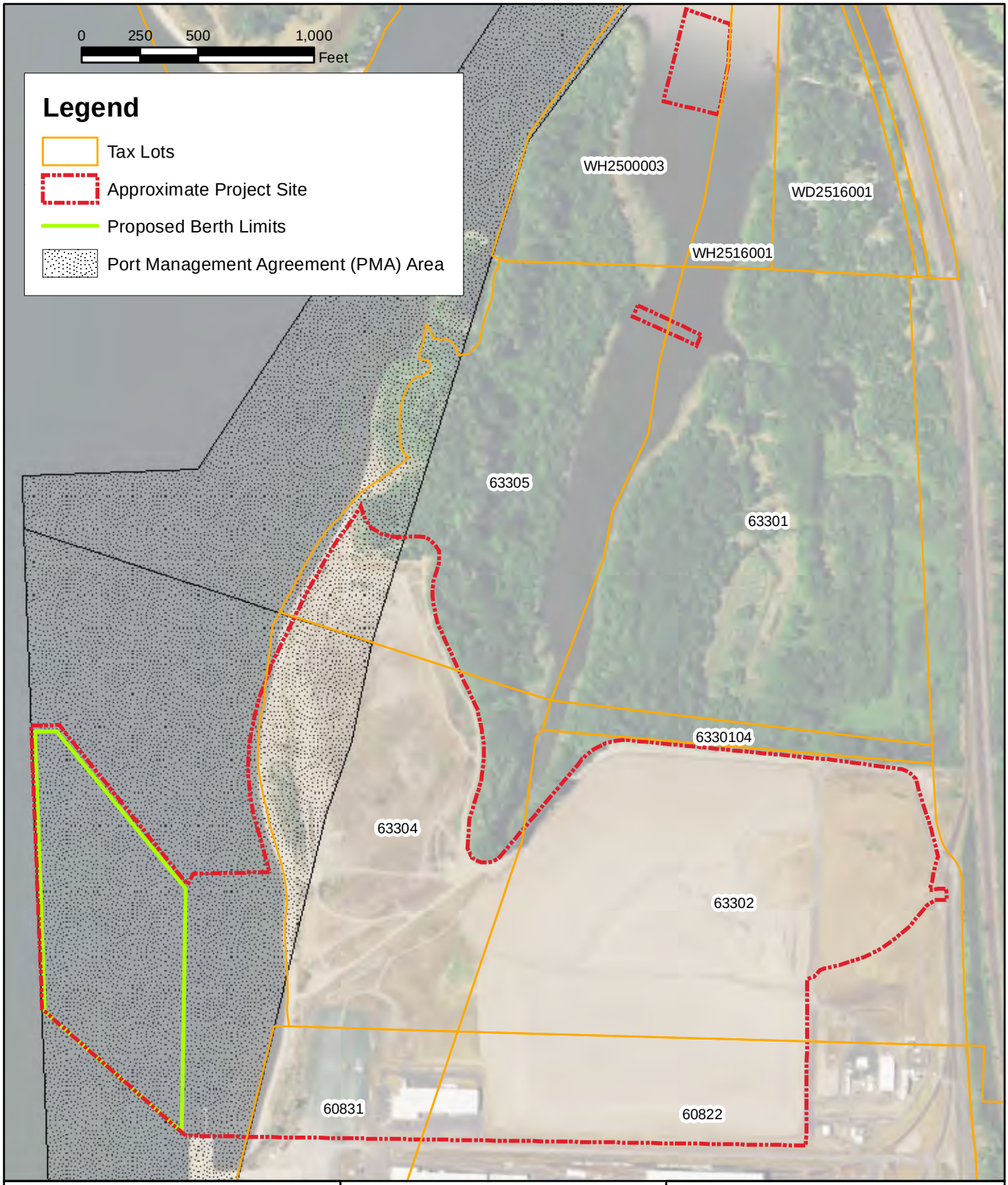

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River
COUNTY OF: Cowlitz County
STATE OF: WA
APPLICATION BY: PORT OF Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, WDFW, BNSF

FIGURE 2: PARCEL MAP

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, Wa. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
OHWM (USACE)= +11.6' CRD

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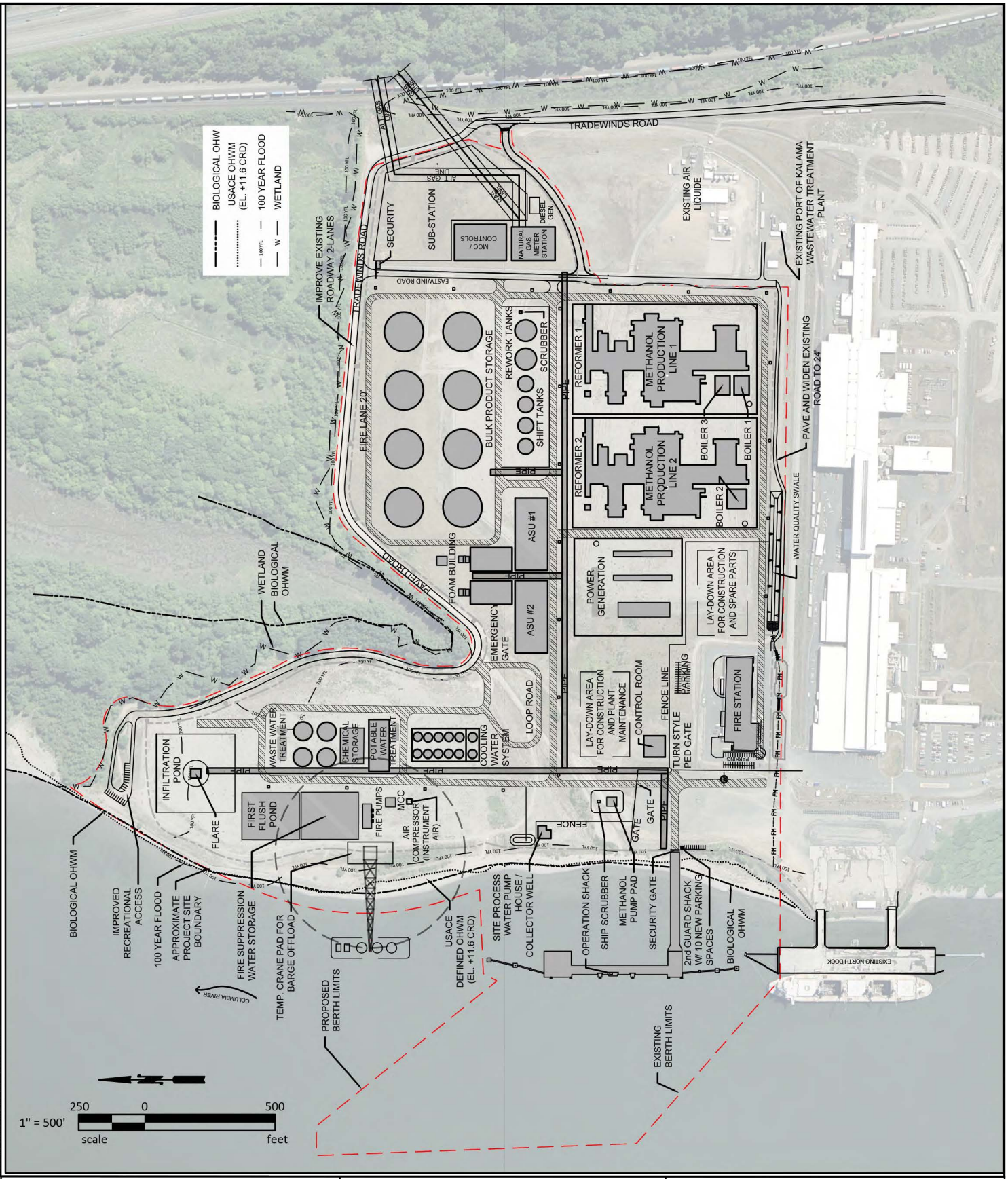

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 3: CONCEPTUAL SITE PLAN

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
OHWM (USACE)= +11.6' CRD

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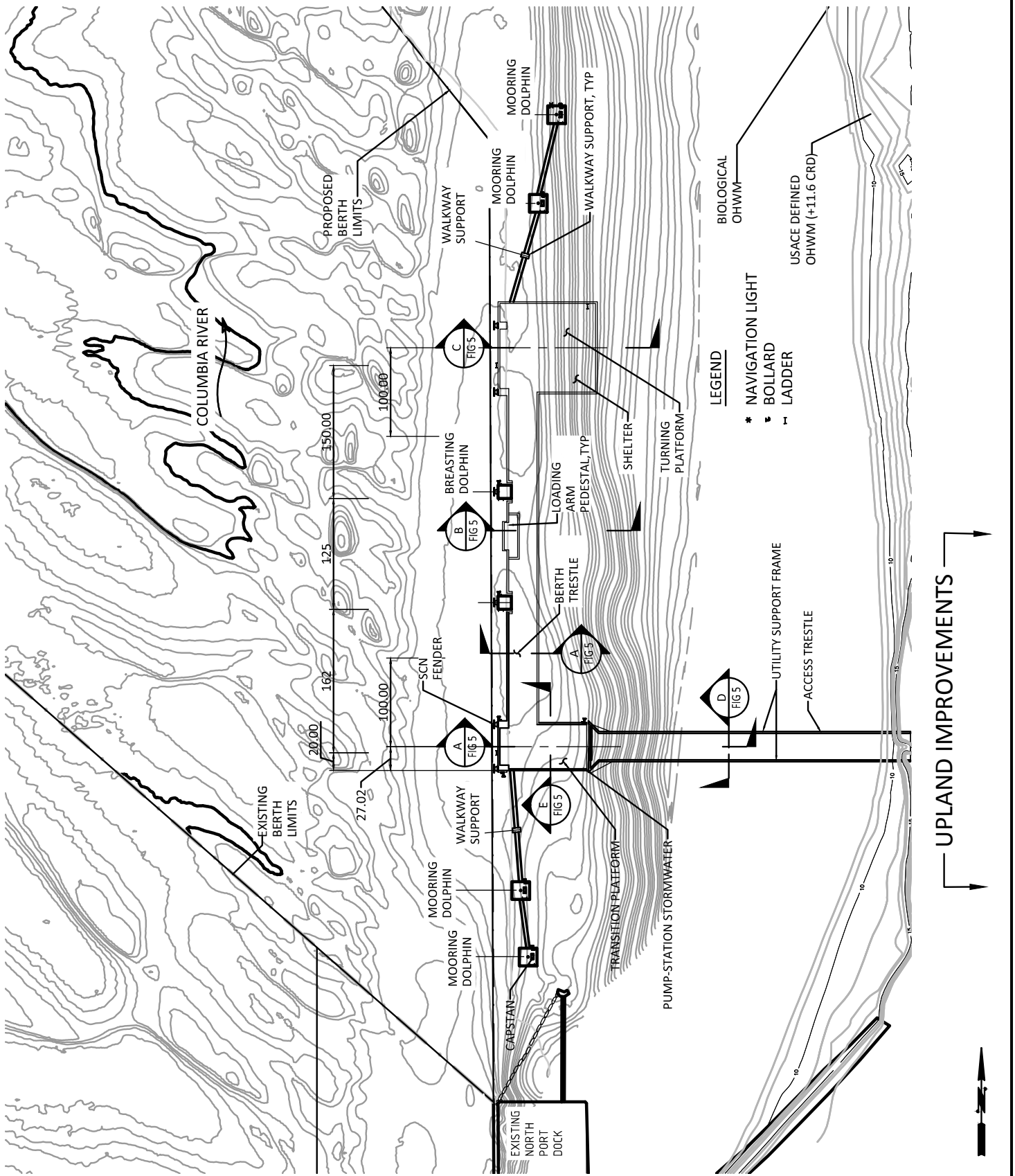

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 4: Marine Terminal Plan

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
OHWM (USACE)= +11.6' CRD

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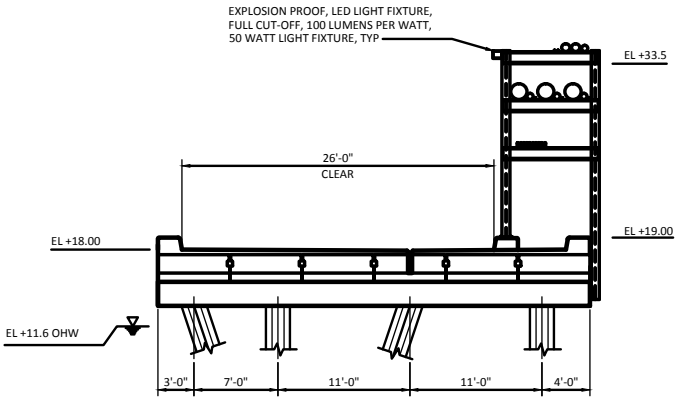
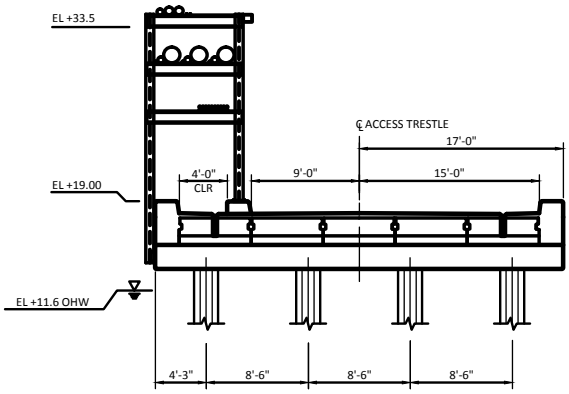
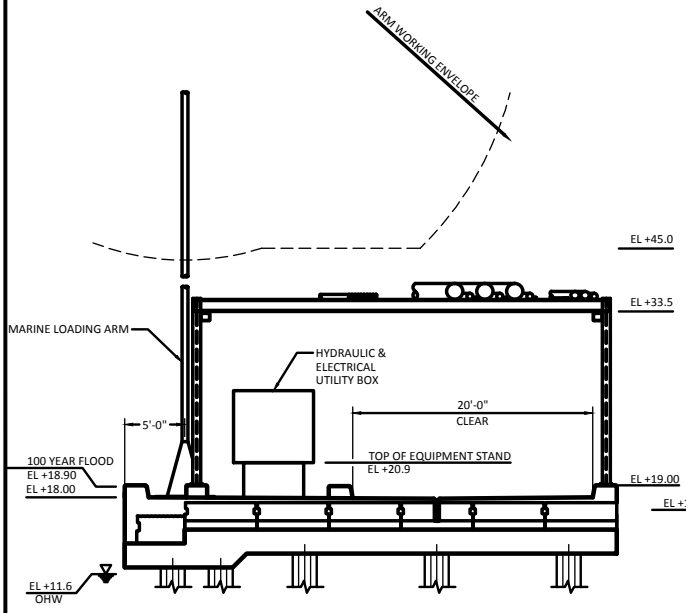


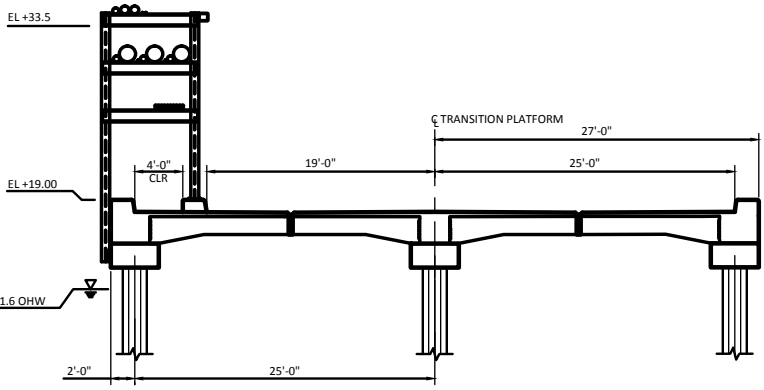
A S-4 BERTH TRESTLE
SCALE: 3/16"=1'-0"



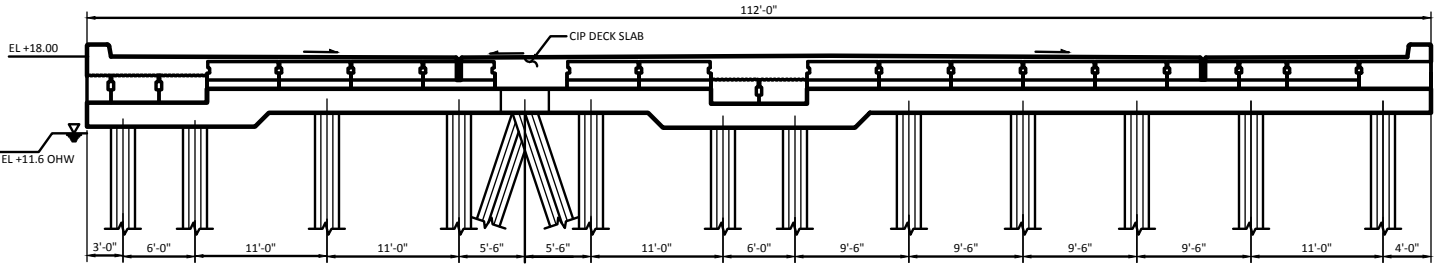
D S-4 ACCESS TRESTLE @ UTILITY FRAME
SCALE: 3/16"=1'-0"



B S-4 BERTH TRESTLE @ MARINE LOADING ARM
SCALE: 3/16"=1'-0"



E S-4 TRANSITION PLATFORM @ UTILITY FRAME
SCALE: 3/16"=1'-0"



C S-4 DOCK SECTION-TURNING PLATFORM
SCALE: 3/16"=1'-0"

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 5: DOCK CROSS-SECTIONS

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
OHWM (USACE)= +11.6' CRD

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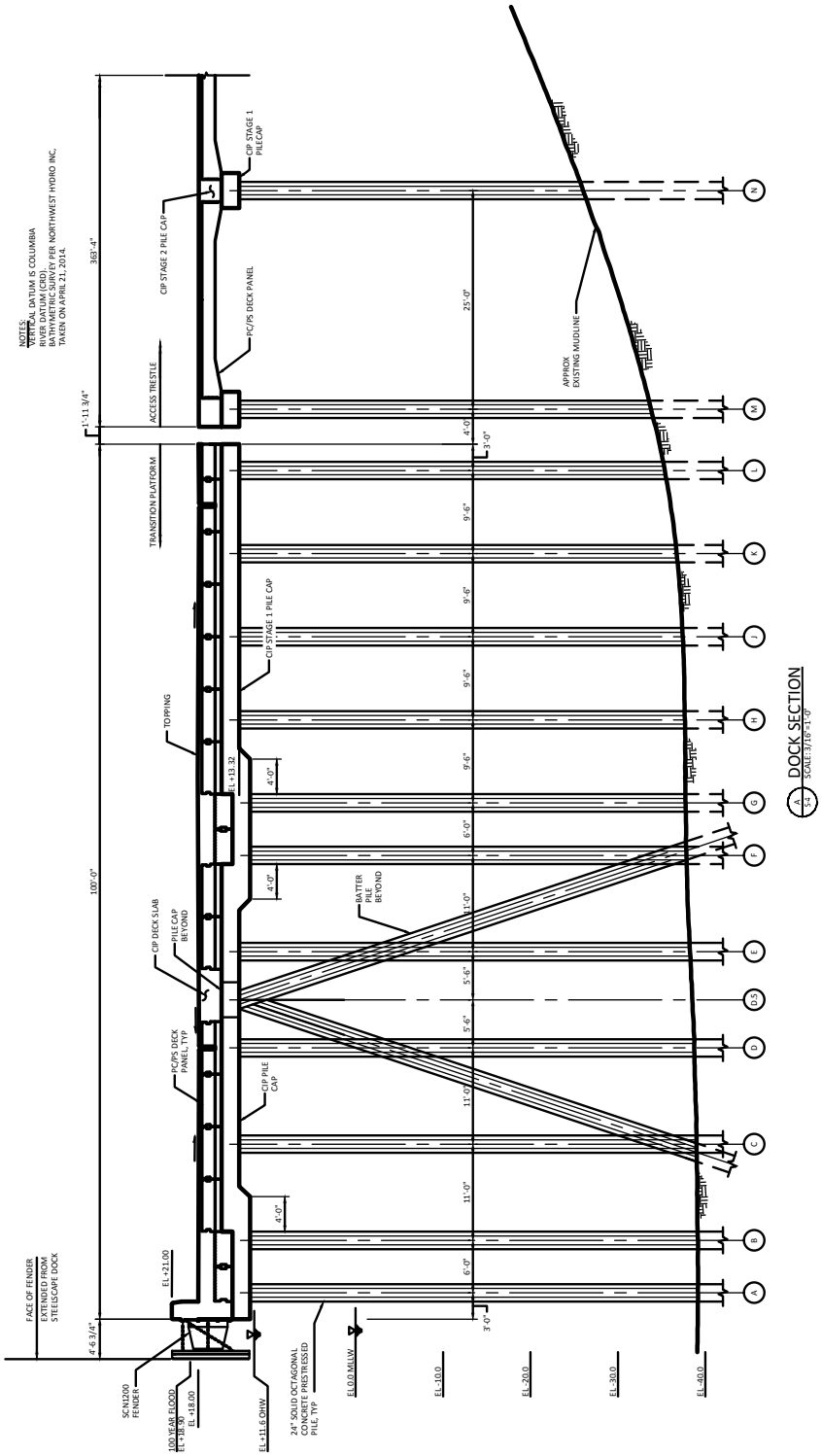

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 6: TRESTLE SECTION

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
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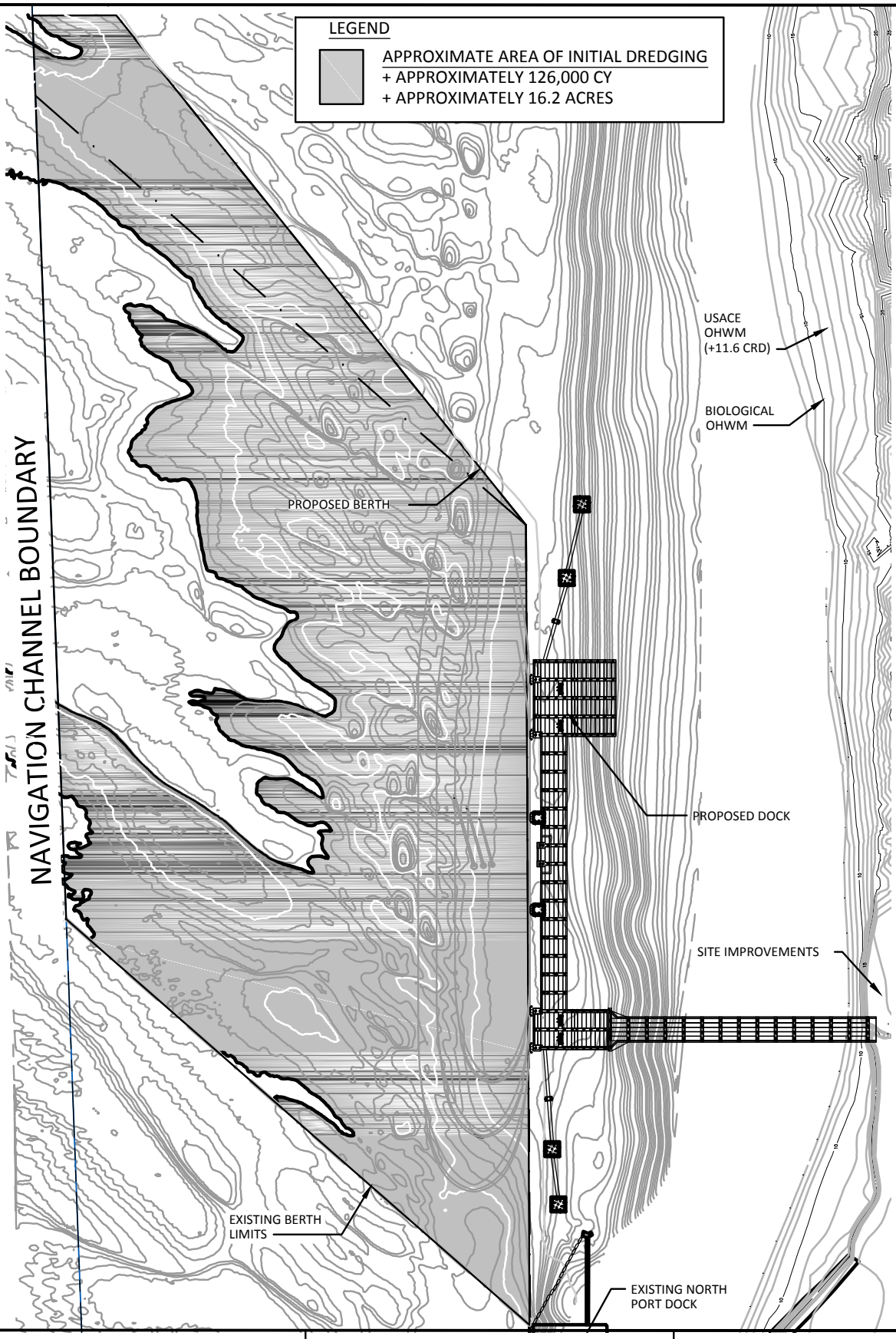

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 7: DREDGING PLAN

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
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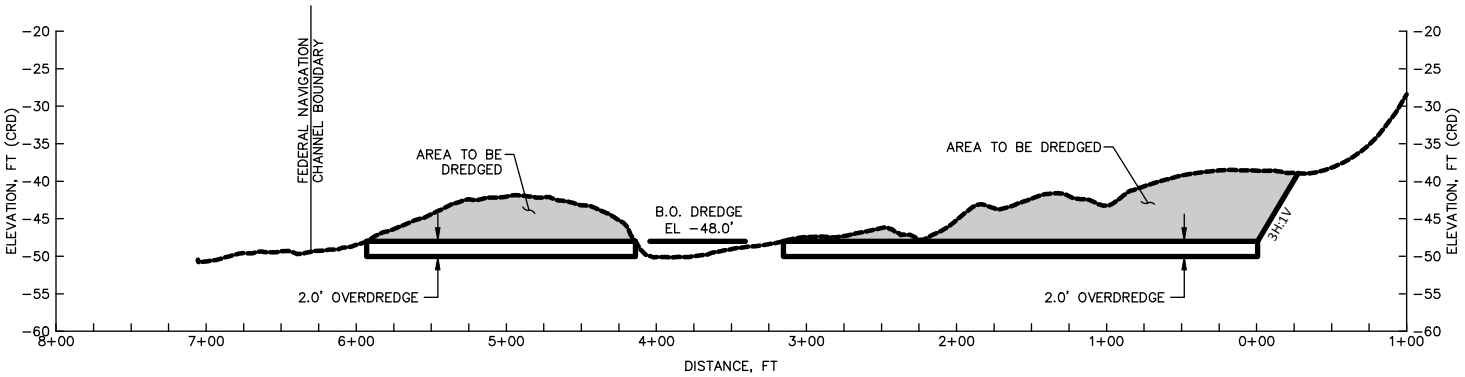

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 8: DREDGING SECTION

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
OHWM (USACE)= +11.6' CRD

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LEGEND

ZONE 1: **SHALLOW WATER (CORPS OHWM ELEVATION [11.6 CRD] TO 20 FEET BELOW CORPS OHWM)**

ZONE 2: **DEEP WATER (DEEPER THAN 20 FEET BELOW CORPS OHWM)**

Shoreline Location Description	Area of Over-water Coverage		# Piles			Area of Pile Footprint (sf)
	Solid	Grated	24-inch Concrete	12-inch Steel	18-inch Steel	
Shallow Water (Corps OHWM elevation [11.6 CRD] to 20 feet below Corps OHWM)						
Access Trestle	10,925 sf	N/A	52	-	-	173
Subtotal	10,925 sf	N/A	52	-	-	173
Deep Water (Deeper than 20 feet below Corps OHWM)						
Access Trestle	1,450 sf	N/A	9	-	-	30
Transition Platform	5,400 sf	N/A	41	-	-	136
Berth Trestle	13,470 sf	N/A	58	-	-	192
Turning Platform	11,648 sf	N/A	68	-	-	225
Fender System	N/A	N/A	-	12	-	11
Breasting Dolphins (2)	450 sf	N/A	14	-	-	46
Mooring Dolphins (4)	800 sf	N/A	48	-	-	159
Grated Walkway	N/A	1,588 sf	-	-	4	7
Subtotal	34,018 sf	1,588 sf	290	12	4	806
10% Contingency for Concrete Piles*	N/A	N/A	30	N/A	N/A	100
Total in-/Over-water	44,943 sf	1,588 sf	320	12	4	1,079

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 9: AQUATIC IMPACTS

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

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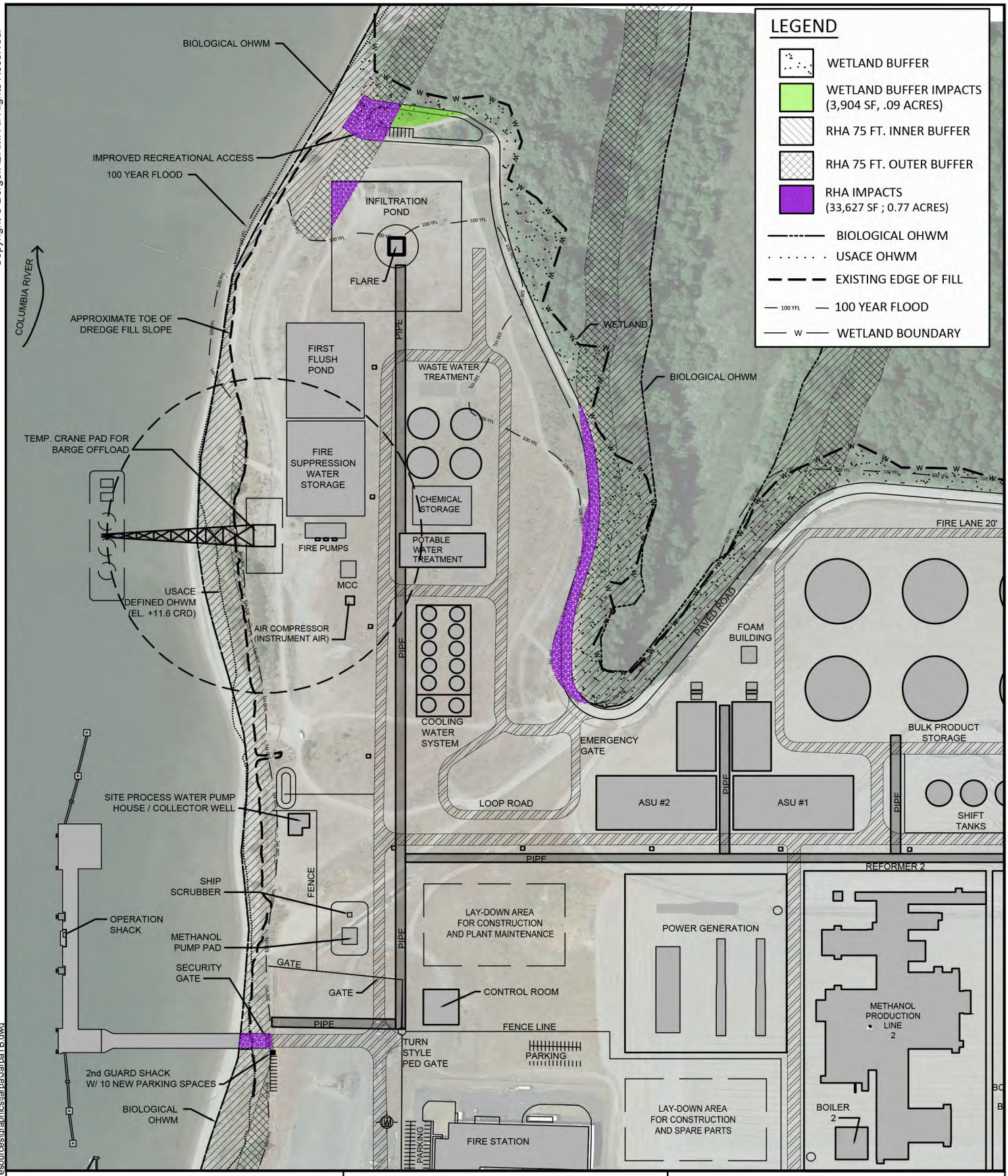

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 10 : RIPARIAN &WETLAND BUFFER IMPACTS

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
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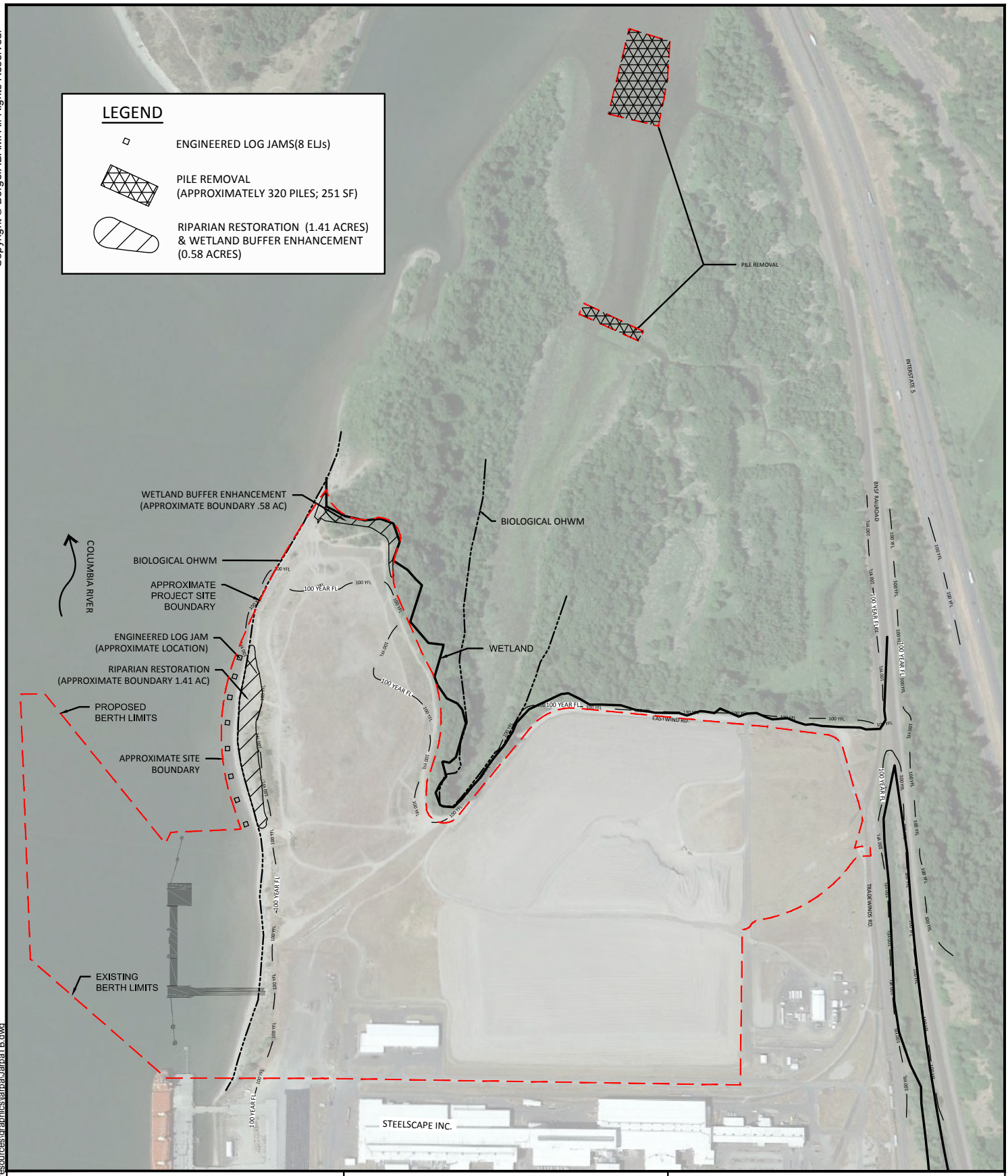

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 11: MITIGATION OVERVIEW

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
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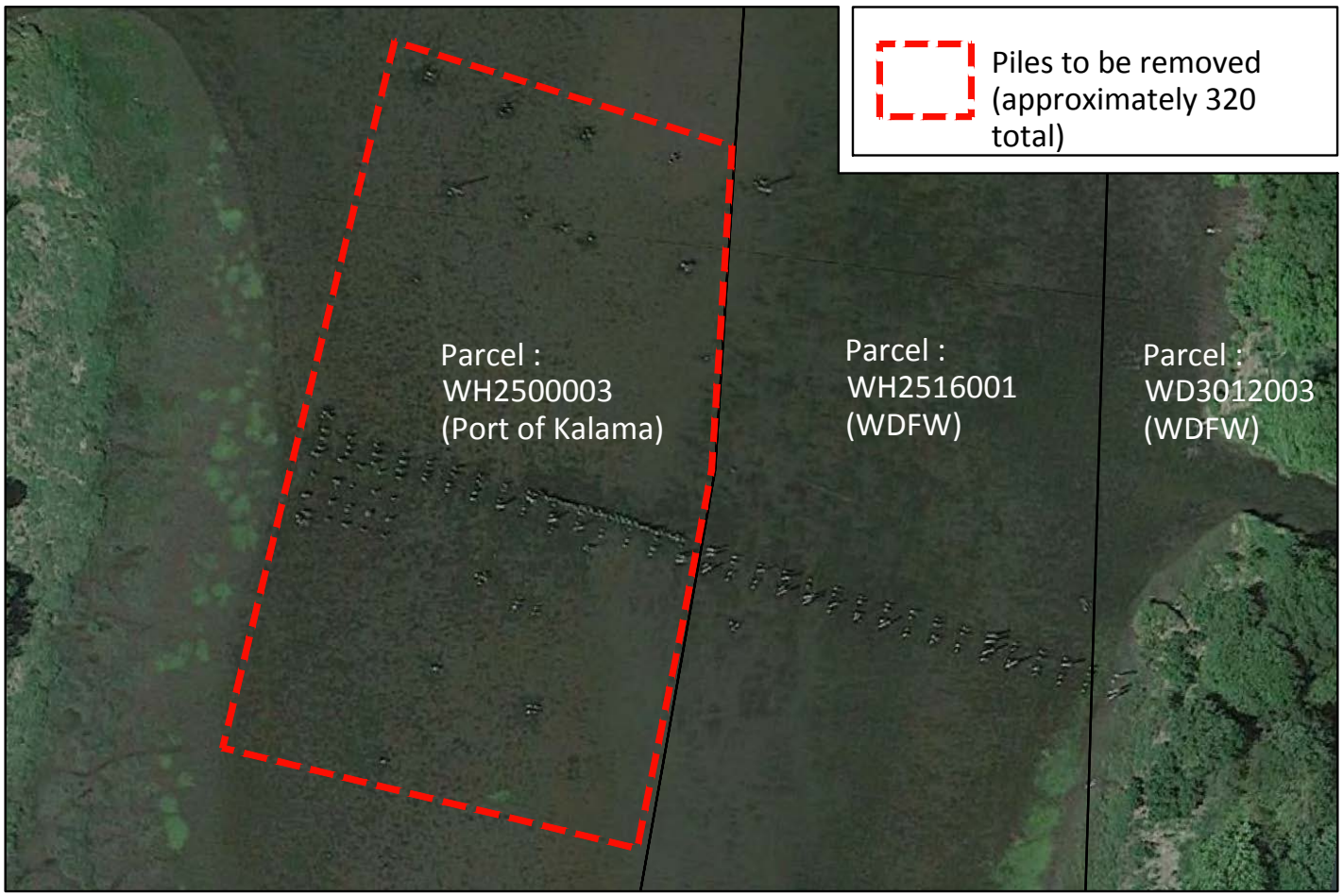
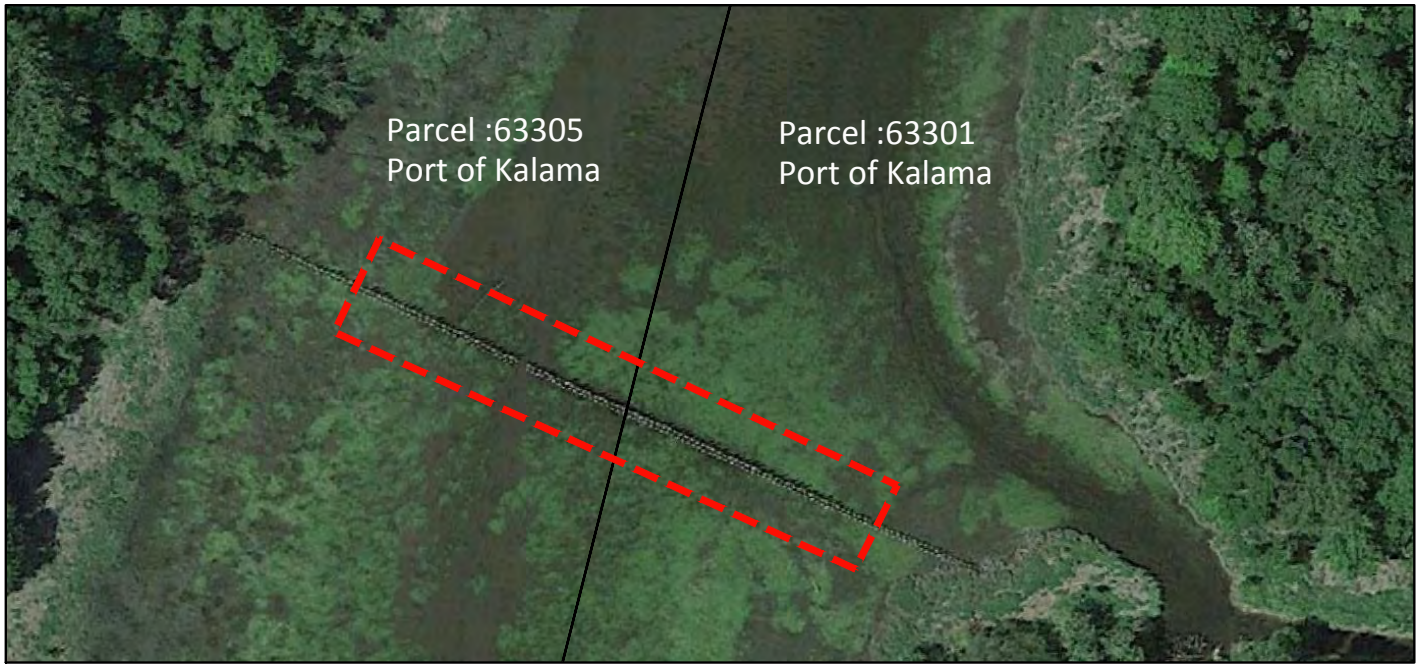


APPROXIMATE NUMBER OF PILES TO BE REMOVED FROM PORT PROPERTY=320



PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 12: PILE REMOVAL

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
OHWM (USACE)= +11.6' CRD

August 2015

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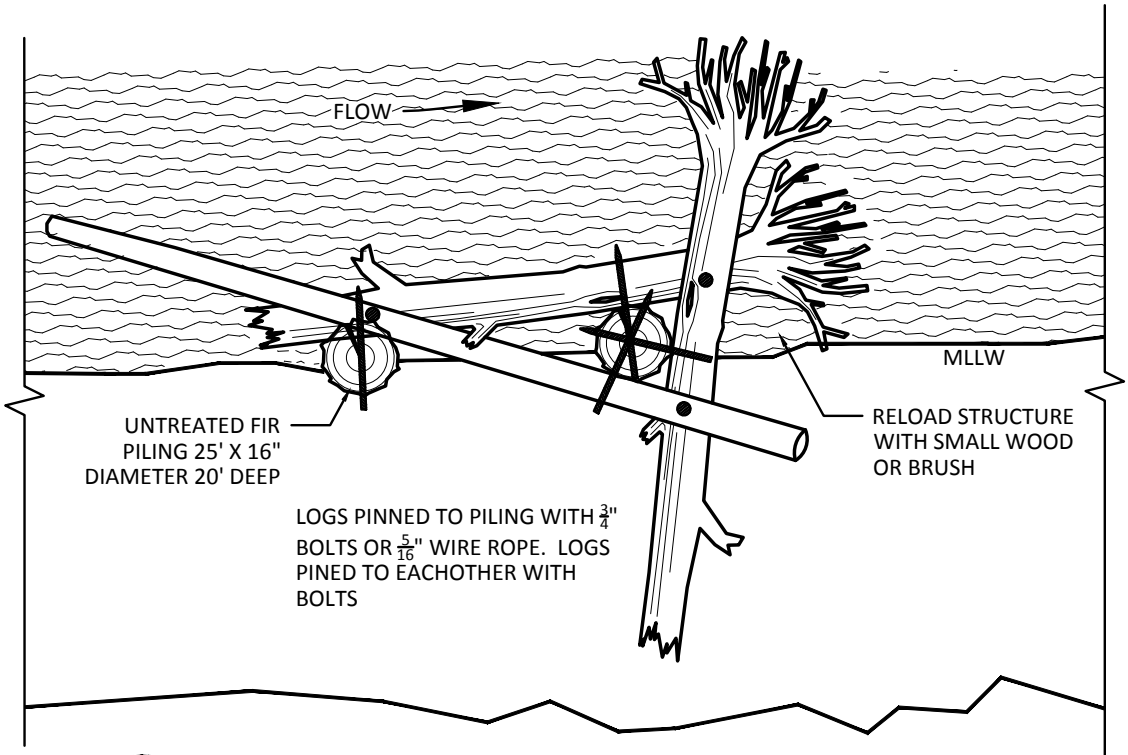
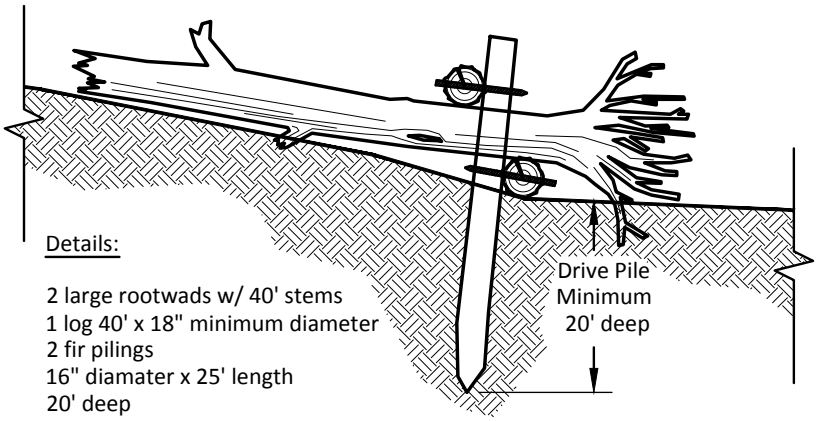


1 — Engineered Log Jam Plan

SCALE: NTS



Details:

2 large rootwads w/ 40' stems
1 log 40' x 18" minimum diameter
2 fir pilings
16" diamater x 25' length
20' deep
36' $\frac{3}{4}$" threaded rod
20 $\frac{3}{4}$" washers

2 — Engineered Log Jam Section

SCALE: NTS

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 13: ENGINEERED LOG-JAM DETAILS

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
OHWM (USACE)= +11.6' CRD

August 2015

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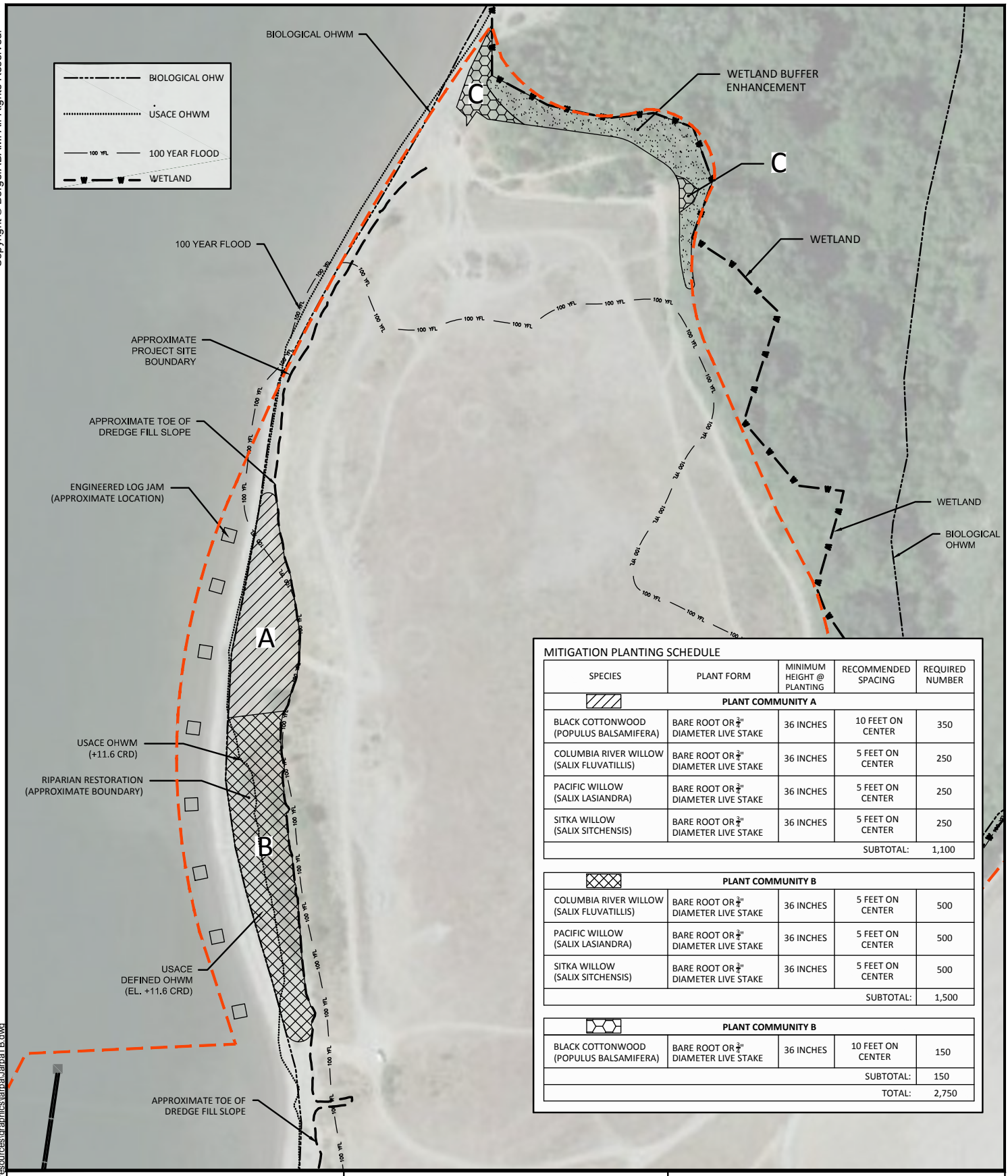

MITIGATION PLANTING SCHEDULE

SPECIES	PLANT FORM	MINIMUM HEIGHT @ PLANTING	RECOMMENDED SPACING	REQUIRED NUMBER
PLANT COMMUNITY A				
BLACK COTTONWOOD (POPULUS BALSAMIFERA)	BARE ROOT OR ¾" DIAMETER LIVE STAKE	36 INCHES	10 FEET ON CENTER	350
COLUMBIA RIVER WILLOW (SALIX FLUVATILLIS)	BARE ROOT OR ¾" DIAMETER LIVE STAKE	36 INCHES	5 FEET ON CENTER	250
PACIFIC WILLOW (SALIX LASIANDRA)	BARE ROOT OR ¾" DIAMETER LIVE STAKE	36 INCHES	5 FEET ON CENTER	250
SITKA WILLOW (SALIX SITCHENSIS)	BARE ROOT OR ¾" DIAMETER LIVE STAKE	36 INCHES	5 FEET ON CENTER	250
			SUBTOTAL:	1,100
PLANT COMMUNITY B				
COLUMBIA RIVER WILLOW (SALIX FLUVATILLIS)	BARE ROOT OR ¾" DIAMETER LIVE STAKE	36 INCHES	5 FEET ON CENTER	500
PACIFIC WILLOW (SALIX LASIANDRA)	BARE ROOT OR ¾" DIAMETER LIVE STAKE	36 INCHES	5 FEET ON CENTER	500
SITKA WILLOW (SALIX SITCHENSIS)	BARE ROOT OR ¾" DIAMETER LIVE STAKE	36 INCHES	5 FEET ON CENTER	500
			SUBTOTAL:	1,500
PLANT COMMUNITY B				
BLACK COTTONWOOD (POPULUS BALSAMIFERA)	BARE ROOT OR ¾" DIAMETER LIVE STAKE	36 INCHES	10 FEET ON CENTER	150
			SUBTOTAL:	150
			TOTAL:	2,750

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River, river mile 72
COUNTY OF: Cowlitz
APPLICATION BY: Port of Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, BNSF, WDFW

FIGURE 14: RIPARIAN PLANTING DETAILS

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, WA. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Project

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
OHWM (USACE)= +11.6' CRD

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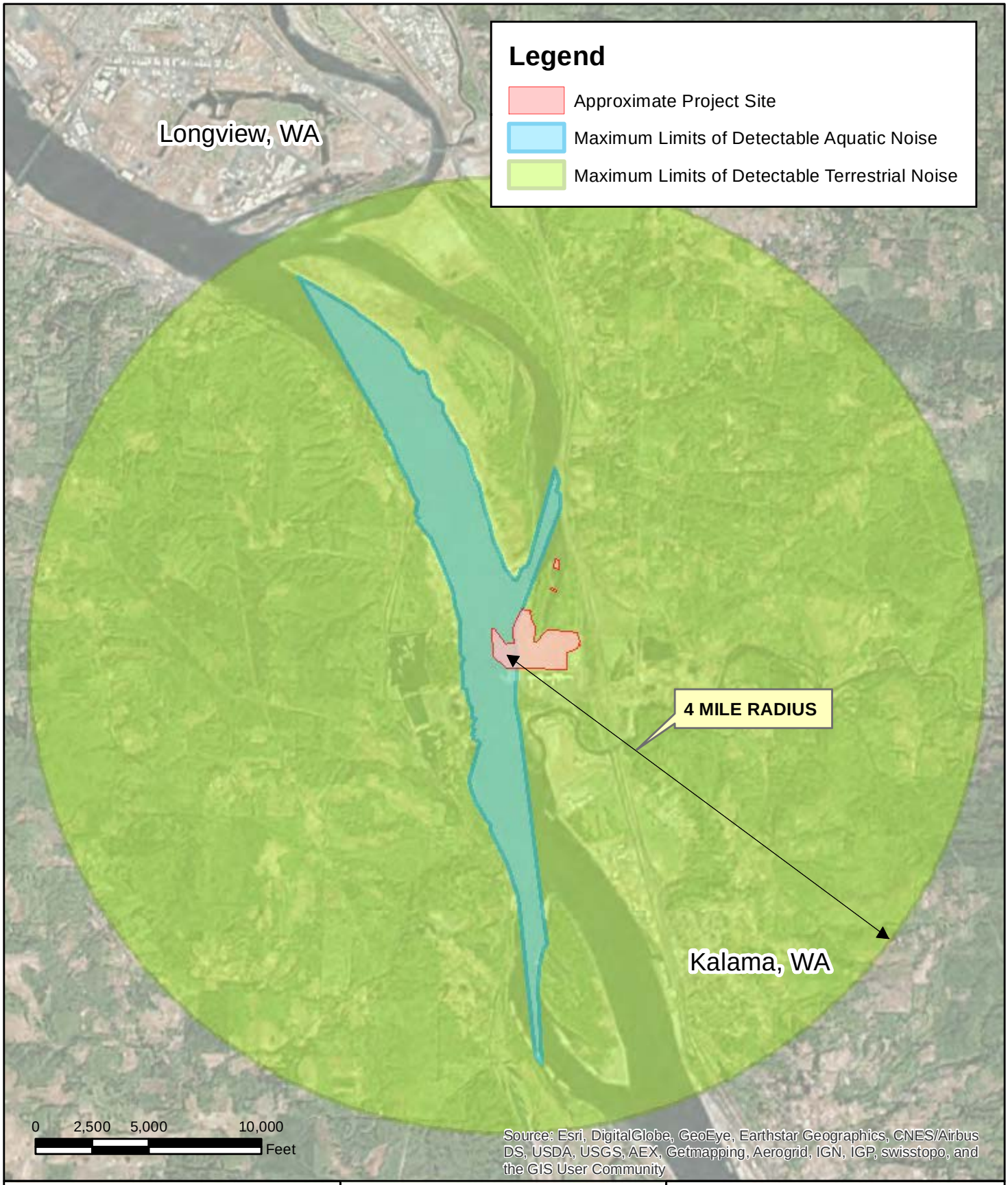

PURPOSE: Construct a facility to manufacture and export methanol

IN: Columbia River
COUNTY OF: Cowlitz County
STATE OF: WA
APPLICATION BY: PORT OF Kalama

ADJACENT PROPERTY OWNERS: Port of Kalama, WA DNR, WDFW, BNSF

FIGURE 15: ACTION AREA

Port of Kalama

Address: 110 W. Marine Dr.
Kalama, Wa. 98625

PROJECT: Kalama Manufacturing and Marine Export Facility Porject

LATITUDE: 45° 02' 40"
LONGITUDE: -122° 52' 00"
DATUM: CRD Columbia River Datum
OHWM (USACE)= +11.6' CRD

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August 2015

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