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:

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]
Mouth of the Columbia River (MCR) – Jetty A Rehabilitation Project (the "Project")

Part 2–Applicant

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

2a. Name (Last, First, Middle)			
Casey, Joyce E., Branch Chief, Environmental Resources Branch			
2b. Organization (If applicable)			
U.S. Army Corps of Engineers (USACE), Portland District, Environmental Planning Section			
2c. Mailing Address (Street or PO Box)			
P.O. Box 2946			
2d. City, State, Zip			
Portland, OR 97208-2946			
2e. Phone (1)	**2f.** Phone (2)	**2g.** Fax	**2h.** E-mail
(503) 808-4760	**503-808-4784**	**(503) 808-4756**	**Joyce.E.Casey@usace.army.mil**

[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.

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)			
Same as above.			
3b. Organization (If applicable)			
3c. Mailing Address (Street or PO Box)			
3d. City, State, Zip			
3e. Phone (1)	**3f.** Phone (2)	**3g.** Fax	**3h.** E-mail

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.)

The staging area and lay down yard for the project is owned by the United States under control of the U.S. Army Corps of Engineers (USACE) and leased to the U.S. Coast Guard (USCG).

☐ 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.

The USACE is working with the DNR and will demonstrate that the project falls under Navigational Servitude for fill in aquatic lands at the site. Determination on use of Navigational Servitude forthcoming from Office of Counsel. The USACE is also working with the DNR in relation to rights of entry for the seagrass planting plan.

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

As stated in Part 4, the USACE is working with the DNR and will demonstrate that the project falls under Navigational Servitude for fill in aquatic lands at the site. Determination on use of Navigational Servitude forthcoming from Office of Counsel.

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

Jetty A at the Mouth of the Columbian River in the vicinity of a USCG Station and Cape Disappointment State Park, on the Long Beach Peninsula, just west of the Ilwaco Channel.

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

Ilwaco, WA 98624

5d. County [help]

Pacific County

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

¼ Section	Section	Township	Range
No quarters plotted.	**9 and 16**	**9N**	**11W**

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)

124.0222 W, 46.1615 N

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

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

09110550002

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)
State of Washington Parks and Recreation	**PO Box 42650** **Olympia, WA 98504**	
Washington State Department of Natural Resources	**1111 Washington St. SE** **Olympia, WA 98504**	
U.S. Coast Guard **ATTN: Beverly Freitas** **Beverly.j.Freitas@uscg.mil**	**2000 Embarcadero** **Suite 200** **Oakland, California 94606-5000**	

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

There are six (6) separate wetland areas adjacent to the Project totaling approximately 0.54 acres. The wetlands are described in the table below, in the below aerial figure, and are shown in Attachment F – JARPA sheets. Note that the mean higher high tide (MHHT) lines in the below aerial equate to jurisdictional ordinary high water (OHW) lines shown on the JARPA drawings (measured using field indicators). Upon update of the previously 2011 delineation, JA3 was determined to no longer exist. The revised and updated wetland delineation was sent electronically to WDOE Rick Mraz on 2/10/2015 and is provided as Attachment K.

Wetlands Adjacent to MCR Jetty A

Wetland ID	Wetland Area (acre)	Buffer Width (feet)[1]	Category	Classification	
				Cowardin	HGM
JA1	0.34	50	III	Palustrine emergent	Depressional
JA1N	0.03	50	III	Palustrine emergent	Depressional
JA2	0.12	50	III	Palustrine emergent	Depressional
JA4	< 0.01	50	III	Palustrine emergent	Depressional
JA5	0.01	50	III	Palustrine emergent	Depressional
JA6	0.04	100	I	Estuarine intertidal emergent persistent	Estuarine salt water tidal fringe
TOTAL	**0.54**				

Wetlands JA1, JA1N, JA2, JA4, and JA5 are non-tidal wetlands formed on top of historical fill in the upper terrace. The wetlands receive water exclusively by precipitation and runoff from higher upland areas. Using the U.S. Fish and Wildlife Service (USFWS) wetland classification system, all of these wetlands are considered palustrine emergent (PEM) wetlands. Plant communities are dominated by slough sedge (*Carex obnupta*), common velvetgrass (*Holcus lanatus*), saltgrass (*Distichlis spicata*), sword fern (*Polystichum munitum*), and rushes (*Juncus spp.*).

According to the 2014 WDOE rating system, the five nontidal wetlands identified within the Project area are classified as Category III wetlands. In Pacific County, Category III wetlands require a minimum 50-foot buffer (Pacific County Code 147, 147A). The wetlands provide a moderate level of function in terms of water quality, hydrology, and habitat benefits; however, the functions of these wetlands are limited by their small size; lack of opportunity to provide water quality or hydrologic functions; and lack of habitat features and vegetative diversity. The wetlands are small, isolated depressions formed on a compacted and disturbed fill terrace.

Wetland JA6 is classified by the USFWS as Estuarine Intertidal Emergent, persistent (E2EM1). Wetland JA6 is hydrologically fed by a 24-inch concrete culvert under a road and by tidal fluctuations in the adjacent Baker Bay. The upper fringe of the wetland, that will be affected by road widening as part of the Project, is dominated by reed canary grass (*Phalaris arundinaceae*). The wetland is a part of a much larger tidal fringe wetland that extends to the northwest. Further from shore, the wetland vegetation shifts to intertidal mudflats. The portion of Wetland JA6 proposed to be affected by the Project provides minimal, if any, flood storage, runoff, or infiltration benefit or groundwater recharge. Habitat value in JA6 is limited by the dominant presence of non-native vegetation, and its location adjacent to a US Coast Guard (USCG) access road, a paved parking area, and a mowed and landscaped road right-of-way.

Attachment G – "Jetty A Proposed Bank Use Plan" provides additional information on these wetlands. As noted, the USACE also provided a recent revised and updated delineation report with additional information.

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

The Project is adjacent to the Mouth of the Columbia River, Pacific Ocean, the Ilwaco Channel, and Baker Bay.

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]

Cape Disappointment is a narrow, rocky headland. Behind the headland is beach dune and swale areas. Upland areas just north of Jetty A, in the proposed staging area, include native and non-native upland vegetation, and depressional wetlands, which are further described in 5i above. Minimal vegetation exists on the Jetty A structure itself or the nearby beaches.

Aquatic habitat in the vicinity of Jetty A consists primarily of shallow-water habitat (defined for this project as water that is between -20 feet to -23 feet below Mean Lower Low Water (MLLW), some of which is intertidal sandflat that is periodically exposed. The dominant substrate consists of relic jetty rock lying atop shifting medium- to fine-grained sand. There is little habitat heterogeneity because of the dynamic current, wind, and wave conditions. Large volumes of driftwood that accumulate on the jetty are transitory within the jetty area. Little terrestrial vegetation grows on the jetty.

Proposed compensatory mitigation (specifically seagrass restoration and incorporation of wood into the barge access causeway) for the Project will include the addition of habitat complexity features and restoration of a nearby unvegetated shallow-water aquatic area suitable for establishing seagrass, most likely in the adjacent Baker Bay.

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

The mouth of the Columbia River (MCR) is located at the confluence of the Columbia River with the Pacific Ocean, between the states of Washington and Oregon. Deep-draft navigation through the MCR is enabled by three key navigation structures: the North Jetty, South Jetty, and Jetty A. Jetty construction during 1885 to 1939 realigned the ocean entrance to the Columbia River, established a stable channel position across the bar (the ebb tidal shoal), and improved navigation reliability through the MCR. The three MCR jetties function to stabilize large shoals that would otherwise enter the navigation channel. Jetty A, constructed in 1939, is necessary to stabilize the north side of the MCR inlet and prevent the northern flank of Clatsop Spit from migrating northward in the Federal Navigation Channel. Specifically, Jetty A provides further protection for the North Jetty.

Jetty A is located within a USCG reservation (Cape Disappointment National Motor Lifeboat Training School), which limits public access to and on the jetty. The USCG facility consists of an access road, housing, offices, a helipad and a shooting range/solid waste area. To the north of this area is the Cape Disappointment State Park.

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

The property north of the USCG lease area is leased to the Washington State Parks and Recreation Commission and is operated as Cape Disappointment State Park. The park includes camping facilities, two lighthouses, an interpretive center and ocean beach access. Cape Disappointment State Park is used by the public for beach access and recreation, hiking, bird watching, and fishing.

Coast Guard Road provides access to the existing USCG boat and air station, housing, helipad and shooting range/solid waste area on the upper terrace directly adjacent to Jetty A, as well as to the beaches on the east and west side of the upper terrace. The area is not open to the public.

Other parcels to the north are classified as forest land or undeveloped land. One parcel to the north is formerly undeveloped land which has been divided into building lots and contains some single family residences.

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

Jetty A is a 1.1 mile-long rock jetty structure, constructed in the 1930s with large armor stone, in need of rehabilitation and repair to maintain its existing purpose. As originally constructed, the jetty extended from Station 49+90 to Station 96+80. Jetty A was constructed with an approximately 30-foot crest width at elevation +20 feet MLLW with original side slopes of about 1 vertical (V) to 1.5 horizontal (H). (Side slopes were repaired to about 1V:1.25H in the 1940s). Jetty A was repaired in the 1940s, 1950s, and 1960s. Previous repair implemented a 24-foot MLLW crest elevation.

Upland of Jetty A, Coast Guard Road is a paved asphalt road in good condition. This road provides access to the USCG Station, which includes an administrative, office, maintenance buildings, and parking lots on land, as well as a small marina. These features are in good condition. The USCG helipad and shooting range/solid waste area are also located upland of Jetty A and will be avoided by this project.

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

From the intersection of First Avenue and Spruce Street W. (Hwy 101) in the City of Ilwaco, travel west one block on Spruce Street and turn left (south) on Second Avenue S.W. Second Avenue becomes Robert Gray Drive (Loop 100). Follow Robert Gray Drive to the southwest, entering Cape Disappointment State Park. After approximately 2.7 miles from the Ilwaco starting point, Robert Gray Drive becomes Coast Guard Road. Follow Coast Guard Road to the south for approximately 1.7 miles to the end of Coast Guard Road. Jetty A begins approximately 500 feet to the left of the end of Coast Guard Road at the southern tip of the small peninsula the road ends on. See Attachment F JARPA Sheet 1 for a map of the Project Location.

Part 6–Project Description

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

The Project is proposed to rehabilitate Jetty A, which has deteriorated over recent years and is currently vulnerable to breaching. Details regarding this Project can also be found in the following attachments:

- **Attachments A through E – JARPA Attachment Forms referred to in the standard JARPA application were not necessary to complete for this Project and are, therefore, not included or attached as part of this permit application package.**
- **Attachment F – JARPA Sheets (sheets 1 through 9)**
- **Attachment G – Jetty A Proposed Bank Use Plan**
- **Attachment H – Water Quality Protection and Monitoring Plan for Section 401 Individual Water Quality Certification**
- **Attachment I – Stormwater Pollution Prevention Plan (SWPPP)**
- **Attachment J – No-test determination email from the Portland Sediment Evaluation Team (PSET)**
- **Attachment K – Updated Wetland Delineation, originally submitted to the WDOE (Rick Mraz) on 2/10/2015**
- **Attachment L – Mouth of the Columbia River Jetty A Repair Mitigation and Monitoring Plan**

Jetty A will be rehabilitated along approximately Station 46+00 to Station 89+00 (Attachment F – JARPA Sheets 2 and 3). Repairs will be made to the upper area of the jetty cross-section (from -5.6 feet to +23.4 feet NAVD88) using armor stone having a size range of 7 to 28 tons. The cross-section repairs for Jetty A are primarily above MLLW, with a majority of stone placement not to extend below -5 feet MLLW. The jetty head (southernmost section) will be stabilized starting at about Station 87 with large armoring stone placed on relic and jetty stone that is mostly above MLLW (see Sheet 4).

The proposed rehabilitation activities includes the addition of rock to fortify the jetty trunk and head, construction access improvements to access the site and length of the jetty, the creation of construction staging/laydown areas (Attachment F – JARPA Sheets 3 and 6), delivery of construction materials, and dredging and construction of a temporary barge off-loading facility adjacent to the jetty (Attachment F – JARPA Sheets 7 and 8). Construction materials will be delivered either by barge or by truck (or both).

An existing USCG navigational tower structure, located at Station 78+00 could also be left in place, removed, or replaced (Attachment F – JARPA Sheets 2 and 3). If replaced, the replacement tower will include construction of a concrete base of about 6 feet by 6 feet by 4 feet (deep). The USCG will provide the tower with a platform, a ladder, a prefabricated re-bar basket with the anchor bolts set in it for the tower base, and a prefabricated wood concrete form with pins for the rock. An existing range marker, located at about Station 86+50, will remain in place and be avoided during jetty repair efforts (Attachment F – JARPA Sheets 2, 3, and 7).

Avoidance and minimization measures are also proposed as part of this Project, as well as compensatory mitigation in the form of mitigation banking for impacts to wetlands north of Jetty A, and non-wetland mitigation activities including seagrass restoration and habitat complexity improvements associated with the jetty.

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

Jetty A was constructed in the 1930s to direct river and tidal currents away from the downstream North Jetty. Jetty A provides important protection for the root and trunk of the North Jetty. Originally over 1 mile in length, the jetty has been reduced by approximately 900 feet since its construction. In 2012, the USACE, Portland District USACE completed a Major Rehabilitation Report (MRR) for the MCR Jetty system. Based on the present poor structural condition of Jetty A, the 2012 MRR recommended that Jetty A be rehabilitated to minimize and reduce the risk for breaching and arrest jetty recession. Without action, Jetty A is expected to continue to deteriorate at a rate of 5 to 20 feet per year. The most recent repairs to Jetty A occurred in 1962.

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.

The Project consists of construction access improvements, the creation of staging/stockpiling areas, delivery of construction materials, rehabilitation of Jetty A, and possible dredging and construction of a temporary material off-loading facility. Construction materials will be delivered either by barge or by truck (or both). The design template for scheduled Jetty A trunk repairs includes a 30-foot crest width, +24-foot MLLW crest elevation, a 1V:1.5 to 1V:2H ocean-side slope, and 1V:1.5H river channel slope from approximately Station 46+50 to approximately Station 87+00. The design template for the jetty head stabilization (Stations 87 to 89+00) will feature a 40-foot crest at approximately elevation +20-foot MLLW with a side-slope of approximately 1V:2H. Total head and trunk repairs for Jetty A will extend from approximately Stations 46+50 to 89+00 and will lie within the existing jetty footprint based on the configuration of the original cross section, previous repair cross sections, and redistribution of jetty rock by wave action.

Spatially variable damage along the exposed length of the jetty will be repaired using up to 82,000 tons of armor stone. Repairs will be made to the upper area of the jetty cross-section (from -5 ft to +24 ft, MLLW) using armor stone having a size range of 7 to 28 tons, each. Median armor stone size will be approximately 18 tons, and repairs will be made using land-based equipment for armor stone placement. Reworked relic stone could account for a little more than 25 percent of the new tonnage placed, about 12,560 tons. Most of the work will occur above MLLW using land-based equipment (a crane or large track-hoe excavator on top of the jetty) and limited water-based equipment. The crane or excavator will use the access pathway to move along the jetty. Rock will be supplied to the land-based placement operation by land and/or marine-based rock delivery.

- **For marine-based rock delivery, a land-based crane or excavator will pick up rock directly from a barge, or from a site on the jetty where rock was previously offloaded and stockpiled, and then placed within the work area. Rock will be moved up and down the jetty along a constructed access pathway (up to 30 feet wide) constructed on the lee side (estuary side) of the jetty.**
- **For land-based rock delivery, a crane or excavator will supply rock via a truck that transports rock from the stockpile area. The crane or excavator will advance along the jetty via an access pathway (up to 30 feet wide) on top of the jetty crest.**

For marine-based rock delivery by barge, a material offloading facility (MOF) may need to be constructed between Stations 77+00 and 86+00 in addition to construction of the above-mentioned access pathway on the lee side of the

jetty. The exact location of the MOF could be anywhere in between these stations, but will look, and be similar in size to, the MOF shown in the attached JARPA sheets. The MOF will include temporary piles and dredging to create adequate bottom clearance with a finish depth of -25.6 NAVD 88 for fully loaded barges. Maintenance dredging may be required for one additional year. The MOF will be removed within two (2) years from the time of construction. Disposal of dredged material will likely be placed as flow-lane disposal into outgoing currents at the mouth of the river, or at a previously approved dredge disposal site. Construction access for the MOF may require a maximum of approximately 60,000 cubic yards (cy) of dredge volume be removed from a maximum area of approximately 1.7 acres (74,052 square feet) and could include an additional maximum 29,640 cy of fill placed to construct and stabilize the MOF. The maximum footprint of the fill for the MOF could be up to 1.2 acres. Approximately 15,000 cy of driftwood, which has accumulated along the trunk of the jetty, will be removed as part of the project, some of which will be incorporated as mitigation into the base of the construction access pathway to serve as fish habitat.

Barge access may rely on berthing a floating crane near Station 84+00 to off-load rock transported by barge onto a temporary staging area. The crest of the jetty construction access pathway will be filled with smaller gradation of armor stone to create an approximately 70-foot-wide temporary stockpile/staging area. This temporary stockpile/staging area will be used to stockpile rock from the barge and allow ample space for off-road trucks to maneuver. An excavator, or similar equipment, will load material from the stockpile onto off-road trucks that are staged in this area. The off-road vehicles will travel to the barge location via the construction access pathway and turn around within the widened portion of the pathway. The widened portion of the pathway is at around elevation +19.4 feet (NAVD88) but will likely be constructed at the final design crest elevation.

The likely scenario is that a crane barge will berth against three dolphins and the material barge will berth against the crane barge. The berthing dolphins will may be comprised of one plumb and two battered steel H or pipe piles, all installed by vibratory driving methods only (impact pile driving is not proposed). The platform and berthing dolphins likely will be equipped with a fendering system comprised of fenders and fender panels. It is anticipated that the crane will be used to unload rock from the barge.

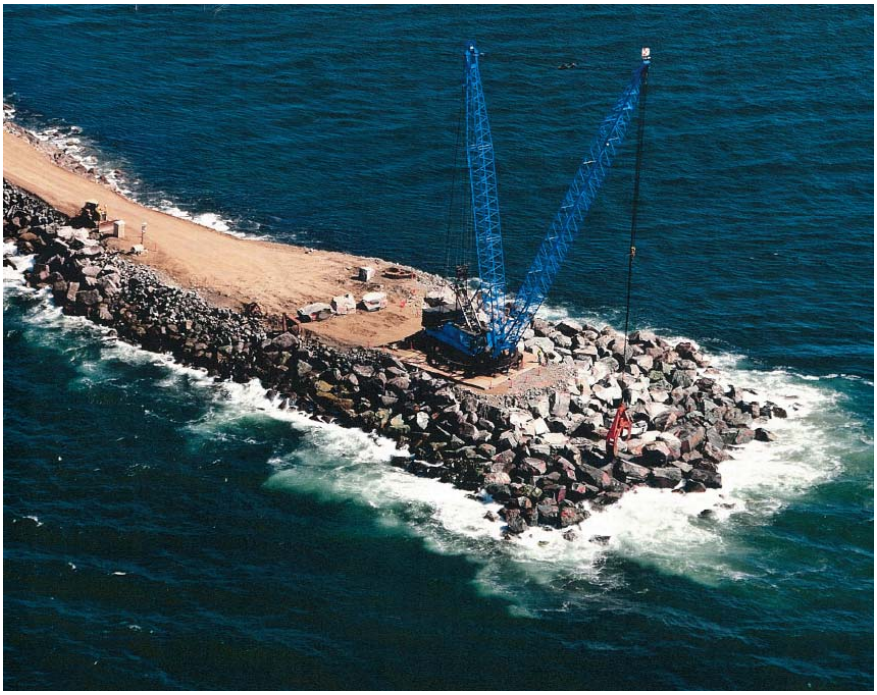
The proposed trunk access improvements include reconstruction of a construction access pathway along the eastern, leeward side of the existing jetty between the stockpile area located near the jetty (Station 46+50) and the jetty head (Station 89+00). Existing debris, primarily driftwood, will be relocated to and distributed through low points in the existing pathway area to act as fill and inwater habitat structures. Rock infill will be placed to fill large voids between the placed driftwood and topping gravel added to provide a suitable surface for construction equipment. The pathway will be no more than 30-ft wide, with side slopes no flatter than 1H:1.5V. No more than two vehicle turnouts will be placed along the pathway allow construction equipment to pass without excessively increasing the width of the pathway. Each turnout will be approximately 20 feet wide by 90 feet long. The fill area footprint of this feature will be no greater than 1.3 acres below the OHW line and will be comprised of a maximum of 38,888 cy of fill. The access pathway will remain in place after construction to allow access for future maintenance and repairs. Driftwood, removed during the construction of the MOF, will be incorporated as mitigation into the base of the construction access pathway to serve as fish habitat. Pursuant to WDFW, wood found on site could be evenly distributed and incorporated into the causeway construction so that wood is in contact with and below the OHW line as much as feasible. This wood is not expected to remain in position over the long-term. It is anticipated to break-up and provide additional habitat complexity along the causeway while in place and it will create habitat benefit as the causeway breaks apart over time.

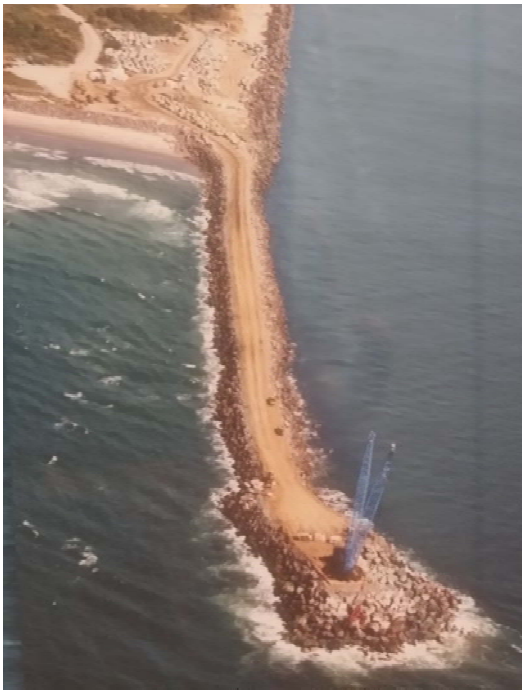
The toe of the rock fill will likely be stabilized by re-working the relic stone to key into the jetty slope at some pre-determined elevation (currently assumed to be 0.0 feet NAVD88) by the contractor. The slope will then be built up using new stone that will eventually be used in the jetty repair and temporarily filled with crushed rock to create an even driving surface for the off-road equipment.

Towards the head of Jetty A, additional crane set up pads (up to five) may be constructed at approximately 40-feet increments to allow crane operation during the placement of the larger stabilization stones. Set-up pads will roughly entail the addition of 8 feet on each side of the crest for a length of about 50 feet.

The below photographs shows construction during recent repairs at the Tillamook Bay North Jetty in 2010, specifically, one example of an access pathway on top of the jetty, placement of stone on the jetty and the staging area north of

the jetty root. At Tillamook Bay, a MOF was not required nor constructed to transport stone to the site. A MOF is currently an option for the MCR Jetty A Project.





To create a material staging and construction laydown area, approximately 7.6 acres of land between the jetty trunk to the south and the Cape Disappointment USCG facility to the north will be leveled, cleared of vegetation, and resurfaced for material stockpiling and construction laydown. The upper terrace is partially filled and graded for use as a heliport. A historical solid waste dump and shooting range located to the west of the heliport will be avoided, and the western edge of the upper terrace is topographically limited by steep bluffs. The helipad adjacent to the proposed stockpile area sees active use throughout the year and will require sufficient horizontal and vertical clearances. A horizontal clearance of 100 feet is required based on coordination with USCG personnel. A minimum of a 20-foot buffer will be in place around the constructed staging/stockpiling area, except for land-based refueling areas, which will have a buffer of about 150 feet.

If the existing USCG navigational tower structure at Station 78+00 is to be replaced, the USACE will do using similar construction methods used at the Tillamook Bay North Jetty in 2010. First, the existing base, in need of replacement is removed and the armor stone exposed. Then, anchors are drilled, the bottom graded with finer stone so that any concrete will not seep through cracks in the jetty stone, and a frame used to contain the new concrete base. The bellow photographs provide examples of a very similar tower replaced on one of the Tillamook jetties.

Avoidance and minimization measures are also proposed as part of this Project, as well as compensatory mitigation in the form of mitigation banking for impacts to wetlands north of Jetty A, and non-wetland mitigation activities including seagrass restoration and habitat complexity improvements associated with incorporating wood within the jetty causeway. Mitigation efforts affiliated with the Project are described in further sections of this form as well as the following attachments:

- **Jetty A Proposed Bank Use Plan**
- **Water Quality Protection and Monitoring Plan for Section 401 Individual Water Quality Certification (WQC)**
- **Mouth of the Columbia River Jetty A Repair Mitigation and Monitoring Plan**

Temporary impacts at Wetland JA6 will be mitigated via post-construction restoration, which will include site specific actions described in more detail in Section 7g.

Seagrass restoration sites are currently being developed (Attachment F – JARPA Sheet 9). Final site plans will be forwarded to the agencies during the summer of 2015 for review. Multiple sites for planting/monitoring within Baker Bay are being considered. Baker Bay is about 5 miles from the construction site. Although the planning for this mitigation project is in its early stages, a survey will be completed in early summer of 2015 to determine the extent of existing seagrass within Baker Bay. Biosonics hydroacoustic equipment and underwater photography ground-truthing methods will be used to complete the survey. Once sites are identified, the mitigation plan will be refined with more detail including locations of mitigation plantings, reference sites and donor beds. The planting phase could use harvested/donor plants, seagrass propagation, or a combination of both. The construction activities will only impact areas currently deemed as low-quality habitat and will not impact existing seagrass beds. Anticipated size of the plot will be determined at a later date, but is expected to be up to about 0.50 acres. Because the final awarded contract may not use an offloading facility, or may select a MOF location with a smaller footprint, mitigation will be scaled to be commensurate with the footprint of impact. If the contractor chooses not to use the barge offloading causeway or MOF, then the USACE would only propose compensatory mitigation for the unavoidable wetland impacts.

The current proposed timeline for seagrass restoration is about one year to evaluate test plots and another 5 years to evaluate final mitigation planting.

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: **October 2015** End date: **October 2017** ☐ See JARPA Attachment D

Most of the construction activities for the Project likely will occur over two seasons in 2015 and 2016. Rock procurement will occur in 2015 and initial placement of rock could also occur. The majority of construction activities will occur in 2016. The MOF will be removed within 2 years of the time of construction.

Seagrass mitigation efforts will begin in the summer of 2015. This will include summer surveys in Baker and Young's Bay. Harvesting donor plants for test plots is expected to occur in the summer of 2016, with monitoring commencing during this time period as well. Harvesting donor plants for mitigation is expected to occur in the summer of 2017, with monitoring beginning one-year post planting and continuing for about five years.

Most upland work could occur year-round.

The general in-water work window for the protection of fish in the Columbia River is November 1 to February 28. Jetty A rehabilitation may occur both in- and outside this time frame. It is anticipated that much of the in-water work will be completed outside the established in-water work period due to the dangerous sea conditions and unacceptable safety risk of working on the jetty. Pile driving (vibratory only) will occur between May 1 and a winter date agreed to by NMFS in order to be protective of marine mammals. This will be reflected in the Incidental Harassment Authorization (IHA) requested by the USACE (currently within review by NMFS).

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

$25 to $30 million

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

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

☒ **Yes** ☐ No ☐ Don't know **U.S. Army Corps of Engineers, Portland District**

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**

Numerous refinements occurred throughout the planning and design phase to avoid and minimize the project's impacts to wetland habitats. To the extent practicable, the staging and material storage areas will be sited to avoid riparian habitat along the river, east of the proposed staging area. However, due to space constraints and the presence of a working USCG facility, repairs to Jetty A will result in unavoidable impacts to wetlands of the United States regulated under Section 404 of the CWA. The Project is anticipated to result in approximately 0.54 acres of unavoidable temporary and permanent wetland impacts and 0.9 acre of impacts to Category III wetland buffers (refer to Table in 7h for more details).

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

Wetland delineation conducted by Tetra Tech in 2011 and updated by the USACE in 2015. The updated report was submitted to the WDOE (Rick Mraz) on 2/10/2015, and is again included as Attachment K.

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

The Delineation Reports both used the Western Washington Wetland Rating System.

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

See Jetty A Proposed Bank Use Plan (AECOM 2015).

A Proposed Jetty A Bank Use Plan (USACE 2015) for impacted wetlands has been prepared and is included in this application package.

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

The project has been designed to take advantage of opportunities to avoid and minimize, to the maximum extent practicable, the project's ecological impacts to wetlands. Efforts were made to reduce the project footprint to the extent practicable, while still achieving the project purpose and need. Minimization measures, including Best management Practices (BMPs), are described in the attached "*Water Quality Protection and Monitoring Plan for Section 401 Individual Water Quality Certification*" (USACE 2015).

The Project will result in unavoidable impacts to both wetlands and waters of the United States regulated under Section 404 of the CWA. The USACE proposes compensatory mitigation for those impacts. Wetland mitigation is described here and mitigation for impacts to non-wetland waters is described in Part 8 of this JARPA.

A number of compensatory wetland mitigation options were considered to offset unavoidable wetland impacts. These options are described in more detail within the *Jetty A Proposed Bank Use Plan*. It was determined that the purchasing of mitigation bank credits at the Long Beach Mitigation Bank (LBMB) will be most effective as onsite mitigation options are limited.

The LBMB is located near Oceanside, WA, on the Long Beach Peninsula, approximately 8 miles north of Jetty A. The 76-acre preservation bank is located within a mature interdunal wetland complex extending along the length of the peninsula. The bank currently has several credits available for purchase and could provide mitigation credit for impacts to wetlands JA1, JA1N, JA2, JA4, and JA5 and their associated protective upland buffer areas. All of these wetlands are Category III closed depressional shrub- or herbaceous-dominated wetlands.

Temporary impacts at Wetland JA6 will be mitigated via implementation of BMPs during construction and post-construction restoration, which will include:

- **Minimization of fill footprint**
- **Use of removable matting under the fill**
- **Implementation of appropriate stormwater BMPs**
- **Remove temporary fill**
- **Restore disturbed soil to pre-construction topography**

- **Seed with native emergent species adapted to the intertidal zone**
- **Cover bare soil with biodegradable erosion control fabric anchored with wood stakes**
- **Plant willow cuttings from nearby native shrubs**

Wetland JA6 will be restored to pre-construction condition within 2 years. Because impacts are considered temporary, and fully restored functions are expected, no compensatory mitigation is proposed.

One additional BMP to be implemented includes minimizing the potential for the introduction of invasive species, such as zebra mussels (*Dreissena polymorpha*), by construction equipment. Prior to transporting to the construction site, all equipment will be visually inspected for zebra mussels and other aquatic nuisance species. Trash, mud, vegetation, and any suspected zebra mussels, will be properly disposed of in land-based receptacles. All construction equipment and supplies intended for use in wetland or other waters that has been exposed to other lake or stream water shall be washed with a power washer or allowed to dry an appropriate length of time. All contaminated runoff shall be adequately contained and disposed of properly.

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 (Acres)	Duration of impact[3]	Proposed mitigation type[4]	Wetland mitigation area (sq. ft. or acres)
Fill	JA1	III	0.34	Permanent	Purchase Mitigation Bank Credits at Long Beach Mitigation Bank	NA
Fill	JA1N	III	0.03	Permanent		NA
Fill	JA2	III	0.12	Permanent		NA
Fill	JA4	III	< 0.01	Permanent		NA
Fill	JA5	III	0.01	Permanent		NA
Fill	JA6	I	0.04	Temporary	On-site restoration	0.04 restored

[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:

See Proposed Bank Use Plan (USACE 2015).

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]

Clean, commercially available, base material will be used to fill wetlands. Clearing and grading of the staging/stockpiling area and the road entails creating a flat surface; thus, cut from high areas may be used to fill low areas. The anticipated amount of fill material to be brought and used to fill these wetlands is up to approximately 3,625 cy.

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]

No excavation within wetlands is proposed other than the removal of the temporary fill placed into JA6.

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 has been designed to take advantage of opportunities to avoid and minimize, to the maximum extent practicable, the project's ecological temporary and permanent impacts to aquatic habitats, pursuant to impact avoidance and minimization requirements under the Clean Water Act (CWA) and Executive Order No. 11990. Efforts were made to reduce the project footprint to the extent practicable, while still achieving the project purpose and need. However, in-water work impacts are unavoidable as fill is required for jetty repair, and dredging may be necessary to create an appropriately sized mooring basin for material delivery. Minimization measures, including BMPs, are described in the attached "*Water Quality Protection and Monitoring Plan for Section 401 Individual Water Quality Certification*" (USACE 2015).

Aquatic habitat in the vicinity of Jetty A consists primarily of shallow-water habitat (defined for this project as water that is between 0 and -20 feet to -23 feet below MLLW [NMFS 2011]), some of which is intertidal sandflat that is periodically exposed. The dominant substrate consists of relic jetty rock lying atop shifting medium- to fine-grained sand. There is little habitat heterogeneity because of the dynamic current, wind, and wave conditions. Large volumes of driftwood that accumulate on the jetty are transitory within the jetty area. Little terrestrial vegetation grows on the jetty.

It is estimated that the Project will result in up to 4.2 acres of in-water work, which has the potential to affect habitat conditions and species that are present along the estuarine shoreline side of the jetty. This includes up to 2.5 acres for the MOF and construction access pathway and up to 1.7 acres of dredging. Most of the rock fill will be placed above Mean Higher High Water (MHHW), with relatively little to be placed in the intertidal and shallow subtidal areas that can provide important functions for aquatic species.

A number of compensatory mitigation options were considered to offset unavoidable impacts to the aquatic environment. Incorporation of large wood into the causeway, and seagrass establishment in Baker Bay was determined to be the best mitigation option. Appropriate mitigation has been proposed and will be commensurate with impacts. A maximum of 0.5 acre of seagrass will be planted. To minimize harm to seagrass donor beds used for transplant material, the Corps will implement controls on harvesting allowable levels of donor material from native beds and will not remove more than 5 to 10% of the eelgrass shoots per unit area in the donor bed. Additional compensation for aquatic habitat impacts will be provided by using beach driftwood that will be removed during the construction of the MOF as base fill for the construction pathway on the jetty crest. The ends of the driftwood will extend into the intertidal shoreline along the estuarine side of the jetty to provide additional habitat complexity enhancements for salmonids, ling cod, and other species that utilize the affected habitat. The combination of these two enhancements is expected to adequately compensate for aquatic habitat functions and values affected by jetty rehabilitation activities.

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

As mentioned previously in the response to Question 6c, incorporation of wood into the causeway and seagrass restoration sites are currently being developed (Attachment F – JARPA Sheet 8). Final mitigation survey plans for

seagrass plantings will be forwarded to the agencies within the spring of 2015 for review. Most likely a site for planting/monitoring within Baker Bay will be selected. Once a site is identified a more detailed mitigation plan will be developed and submitted to the Washington State Department of Ecology, outlining the specifications and details for the proposed action, once a final site has been selected. The planting phase could use harvested/donor plants, the propagation of new seagrass, or a combination of both. The planting will only impact areas currently deemed as low-quality habitat and will not impact existing seagrass beds. Anticipated size of the plot will be commensurate with the construction and delivery plan, which will be determined by contract award at the end of September, but is expected to be up to 0.5 acres. The USACE is not proposing to monitor the placement or movement of incorporated wood.

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]

See response to 8a above.

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

Activity (clear, dredge, fill, pile drive, etc.)	Water-body name[1]	Impact location[2]	Duration of impact[3]	Amount of material (cy) to be placed in or removed from waterbody	Area (acres) of waterbody directly affected
Cut for Construction Access Pathway (includes driftwood)	Columbia River	In-water	Permanent	Up to 15,000	Approx. 2.6 acres on top of jetty, of which approx. 1.0 acre is below OHW (riverside)
Fill for Jetty (armor stone) Head and Trunk			Permanent	Up to 46,200	Approx. 2.96 crest acres (jetty to be repaired for ~4,300 ft with crest width of 30 ft)
Fill for MOF			Permanent	Up to 29,640 total Up to 7,778 below MLLW	1.2
Fill for Construction Access Pathway			Permanent	Up to 38,888	1.3 below OHW (riverside)
Fill for Jetty (driftwood)			Permanent	Max. practicable maintaining stable access causeway	Max. practicable, estimated ~ 0.76 acres (0.25 miles available at 25 ft vertical range)
Initial Dredging for MOF Basin			Permanent	Up to 60,000	1.7
Install (vibratory) up to 3 dolphins for MOF (up to 24 steel pipe piles, up to 24-inch diam. each) Install (vibratory) up to 93 Z or H pile sections for MOF			Temporary	n/a	n/a
Maintenance Dredging for MOF Basin (within 1 year after construction)			Temporary	Up to 10,500	1.7

[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]

Approximately 68,528 cy of fill is needed for construction of the MOF and the construction access pathway. Fill will be reworked from materials at the site and acquired from clean upland sources. Fill will be placed along the leeward side of Jetty A likely working from the landside with conventional earthwork equipment, though placement from the water is also possible. Work will likely start at the jetty root and progress toward the jetty head once the access pathway is completed. However, the contractor also may propose barge delivery and placement from the head to the root.

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 of the MOF Basin will most likely be performed using a clamshell dredge, though there is a very small chance that a pipeline dredge could be used. A maximum of 60,000 cy may be removed, but could be much smaller. The materials to be dredged are primarily sandy. The material will likely be placed as flow-lane disposal site into outgoing currents at the mouth of the river, or at a previously approved deepwater dredge disposal site.

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
Washington Department of Ecology (WDOE)	Rick Mraz	(360) 407-6221	3/19/2015
Washington Department of Ecology (WDOE)	Lori Kingsbury	(360) 407-6167	4/2/2015
Washington Department of Natural Resources (DNR)	Rick Schwartz	(360) 577-2025	3/4/2015
U.S. Fish and Wildlife Service (USFWS)	Kathy Roberts	(503) 231-6179	02/2015
NOAA's National Marine Fisheries Service (NMFS)	Jeff Fisher	(360) 534-9342	4/24/2015
NOAA's National Marine Fisheries Service (NMFS)	Ben Laws	(301) 427-8425	04/17/2015
NOAA's National Marine Fisheries Service (NMFS)	Teresa Mongilo	425-347-6935 ext 223	4/24/2015
Washington Department of Archaeology and Historic Preservation (DAHP)	Robert Whitlam	(360) 586-3080	3/3/2015
Washington State Parks and Recreation	Evan Roberts	(360) 642-3078	1/15/2015
Washington Department of Fish and Wildlife (WDFW)	Chris Conklin	(360) 249-1208	3/19/2015

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

Oregon and Washington have classified the lower Columbia River as water quality-limited and placed it on the CWA Section 303(d) list for the following parameters: RM 0 to 35.2 for temperature and polychlorinated biphenyls (PCBs); RM 35.2 to 98 for arsenic, dichlorodiphenyl trichloroethane (DDT), PCBs, and temperature; and RM 98 to 142 for temperature, arsenic, DDT, PCBs, and polynuclear aromatic hydrocarbons (PAHs). In Washington, the river also is on the Section 303(d) list for dichloro-diphenyl-dichloroethane, Alpha BHC (a

pesticide), mercury, dissolved gas, dieldrin, chlordane, aldrin, dichloro-diphenyl-dichloroethylene, fecal coliforms, and sediment bioassay. The river is also subject to a USEPA total maximum daily load for dioxin.

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.

17080006 Lower Columbia

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 24 Willapa

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

See attached Water Quality Protection and Monitoring Plan for Section 401 Individual Water Quality Certification.

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

Name of manual:

The USACE is not proposing the permanent addition of any impervious surfaces beyond existing road repairs. The USACE will follow all conditions and requirements in the NPDES Construction General Permit issued by the Environmental Protection Agency for federal projects.

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

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

☐ Yes ☒ **No**

The USACE received a no-test determination from PSET on April 22, 2014; the notification is included in the attachments.

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

The property did not exist previous to 1939, since it is formed from sands that accreted as a result of jetty construction. Since that time, the USACE has leased the property to the U.S. Coast Guard and used the project area for jetty maintenance.

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

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

☒ Yes ☐ **No**

The USACE coordinated with the Washington Department of Archaeology and Historic Preservation (DAHP) and received concurrence with its no adverse effects determination on 5/13/2014. The USACE Archaeologist performed a desktop review and evaluation and updated DAHP about discovered structures on Jetty A, and received updated concurrence on 3/3/2015 to assure compliance with section 106 of the National Historic Preservation Act.

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]

Consultation was undertaken and completed with both the NMFS and the USFWS to address the potential for the rehabilitation/repair of the MCR Jetty System to cause the take of any species listed under the ESA or to affect designated critical habitat.

The NMFS determined that the proposed action is not likely to jeopardize the continued existence of eulachon (*Thaleichthys pacificus*), Steller sea lions (*Eumetopias jubatus*), and humpback whales (*Megaptera novaeangliae*). For proposed critical habitat for eulachon, leatherback turtles and LCR coho salmon the USACE provided a conference report, and subsequent the BiOp, NMFS adopted the not likely to affect determination in the conference report when this habitat became designated. During a January 15, 2015 webinar/conference call, NMFS confirmed that the project components remain within the scope of the effects determination. In order to construct the pile installation for the MOF, an Incidental Harassment Authorization (IHA) is required. An IHA Request will be submitted to the NMFS in April/May 2015.

A BA was also submitted to the USFWS in 2011 evaluating potential effects of the jetty system rehabilitation/repair project. The USACE determined and USFWS concurred by letter dated February 23, 2011 (13420-2011-I- 0082) that the project may affect but is not likely to adversely affect bull trout (*Salvelinus confluentus*) and its critical habitat, marbled murrelet (*Brachyramphus marmoratus*) and snowy plover (*Charadriusalexandrinus nivosus*). The USACE also made a no-effect determination for: short-tailed albatross (*Phoebastria albatrus*); northern spotted owl (*Strix occidentalis caurina*), Columbian White-tailed deer (*Odocoileus virginianus leucurus*), Oregon silverspot butterfly (*Speyeria zerene hippolyta*), streaked horned lark (*Eremophila alpestris strigata*), and Nelson's checkermallow (*Sidalcea nelsoniana*) and associated critical habitat.

During the January 15, 2015 webinar/conference call, NMFS and the USFWS concluded that rehabilitating Jetty A, and implementing the current mitigation concepts are within the scope of effects evaluated in the two BAs, the BiOp, and the Letter of Concurrence.

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]

According to the Washington Department of Fish and Wildlife's Priority Habitats and Species List (accessed on the web 4/17/2015), the following listings are applicable to the project area and could be indirectly or directly affected by the project due to their proximity to the proposed actions:

- **Bald eagle breeding area north of the proposed upland Jetty A staging area. Baker Bay probably represents the focal area for foraging by these pairs as waterfowl and fisheries resources are plentiful in the bay. Bald eagles have been observed foraging along the shoreline from Ilwaco to the Fort Canby boat launch, on or adjacent to West Sand Island, and from pilings scattered throughout the western portion of Baker Bay. Foraging activities along the North Jetty and Benson Beach may occur infrequently.**
- **Seabird concentrations breeding area north of the proposed upland Jetty A staging area. This area is north of the proposed staging area and will not be adversely affected by the project. Breeding birds could still forage in other areas of the bay and ocean even with ongoing jetty construction.**
- **Estuarine intertidal aquatic habitat – the USACE has proposed compensatory mitigation for fill in waters of the U.S.**
- **Palustrine aquatic habitat: wetlands – the USACE has proposed compensatory mitigation for fill in wetlands.**
- **Regular waterfowl concentrations in Baker Bay. These species could avoid construction equipment used for future seagrass mitigation sites in Baker Bay. Seagrass mitigation Baker Bay would result in long-term improvements in shallow water habitat.**
- **Seabird concentrations in Baker Bay. These species could avoid construction equipment used for future seagrass mitigation sites in Baker Bay. Seagrass mitigation Baker Bay would result in long-term improvements in shallow water habitat.**

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.

☐ A SEPA determination is pending

☐ 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:

This is a federal project on federal land. A 2012 National Environmental Policy Act (NEPA) Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) have been prepared.

☒ **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.**

The USACE is working with DNR and will demonstrate that the project falls under Navigational Servitude for fill in aquatic lands at the site. Determination on use of Navigational Servitude forthcoming from Office of Counsel. The USACE is also working with DNR in relation to rights of entry for the seagrass planting plan.

Washington Department of Ecology:

☒ **Section 401 Water Quality Certification**

The USACE is seeking an individual Section 401 State WQC from the Washington Department of Ecology.

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)**

The USACE does not permit itself. Instead, a Revised 404 (b) (1) evaluation was prepared on June 20, 2012 to evaluate all components of the major rehabilitation, which encompasses the work proposed at Jetty A. The USACE has determined the action does not fit under a nationwide category, and is seeking individual Section 401 State Water Quality Certification from Washington Department of Ecology.

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~~ compliance documents [the Corps is not requesting permits, nor does it permit itself].

I hereby authorize the agent named in Part 3 of this application to act on my behalf in matters related to this application. _____ (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. Agencies must check-in through the proper Coast Guard channels. _____ (initial)

Joyce E. Casey, Environmental Branch Chief, USACE	CASEY.JOYCE.E.1387943206 Digitally signed by CASEY.JOYCE.E.1387943206 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=CASEY.JOYCE.E.1387943206 Date: 2015.04.27 16:11:49 -07'00'	
Applicant Printed Name	Applicant Signature	Date
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.

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.

U.S. Army Corps of Engineers, Portland District		
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

JARPA Appendix F
JARPA Sheets

For
Rehabilitation of Jetty A
Near the Mouth of the Columbia River, Pacific County, Washington

Submitted by the U.S. Army Corps of Engineers, Portland District,
Civil Works

April 2015

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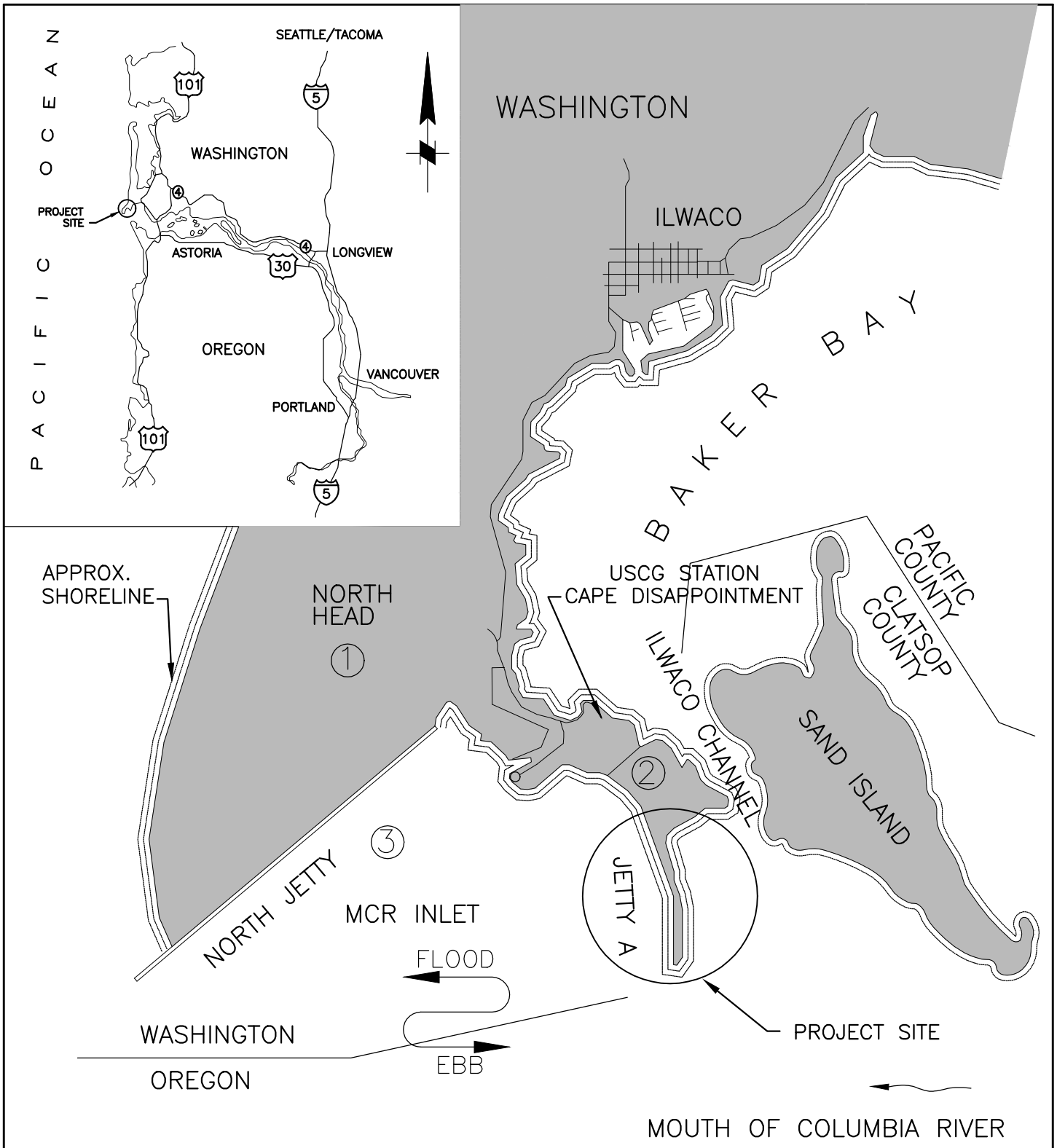


LOCATION AND VICINITY MAPS

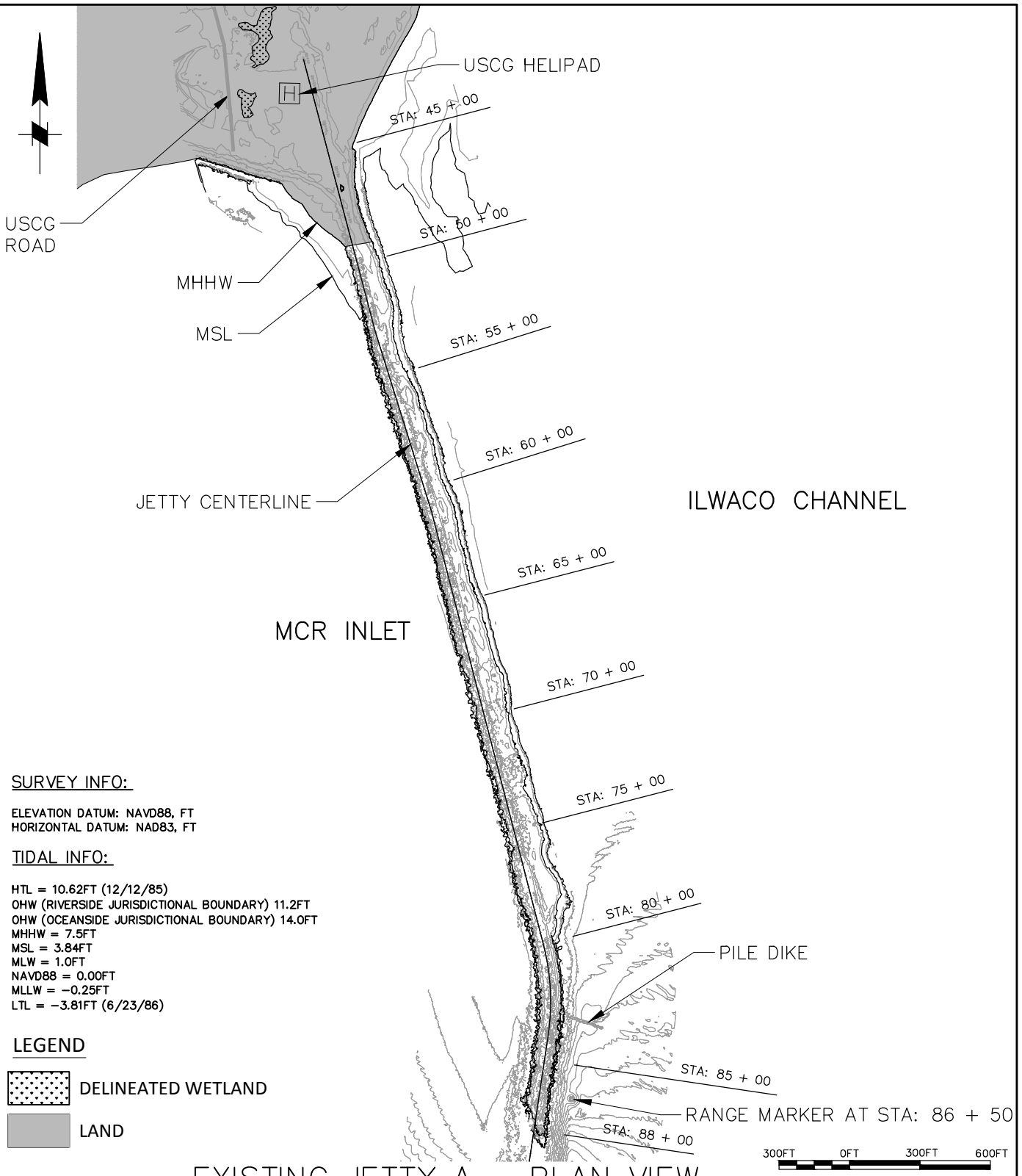
DATUM: NAVD88

ADJACENT PROPERTY OWNERS OF RECORD:

① STATE OF WASH. PARKS & REC.
② U.S. COAST GUARD
③ WASH. STATE DEPT. OF NATURAL RESOURCES

PROPOSED JETTY A REHABILITATION
PURPOSE: TO STRENGTHEN THE JETTY A STRUCTURE
IN: MOUTH OF COLUMBIA RIVER, USCG CAPE DISAPPOINTMENT
CITY & COUNTY : NEAR ILWACO, PACIFIC COUNTY
STATE : WASHINGTON
APPLICATION BY: U.S. ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT

SHEET 1 OF 9 DATE: APR 17, 2015



SURVEY INFO:

ELEVATION DATUM: NAVD88, FT
HORIZONTAL DATUM: NAD83, FT

TIDAL INFO:

HTL = 10.62FT (12/12/85)
OHW (RIVERSIDE JURISDICTIONAL BOUNDARY) 11.2FT
OHW (OCEANSIDE JURISDICTIONAL BOUNDARY) 14.0FT
MHHW = 7.5FT
MSL = 3.84FT
MLW = 1.0FT
NAVD88 = 0.00FT
MLLW = −0.25FT
LTL = −3.81FT (6/23/86)

LEGEND

DELINEATED WETLAND

LAND

EXISTING JETTY A – PLAN VIEW

DATUM: NAVD88
ADJACENT PROPERTY OWNERS OF RECORD:
① STATE OF WASH. PARKS & REC.
② U.S. COAST GUARD
③ WASH. STATE DEPT. OF NATURAL RESOURCES

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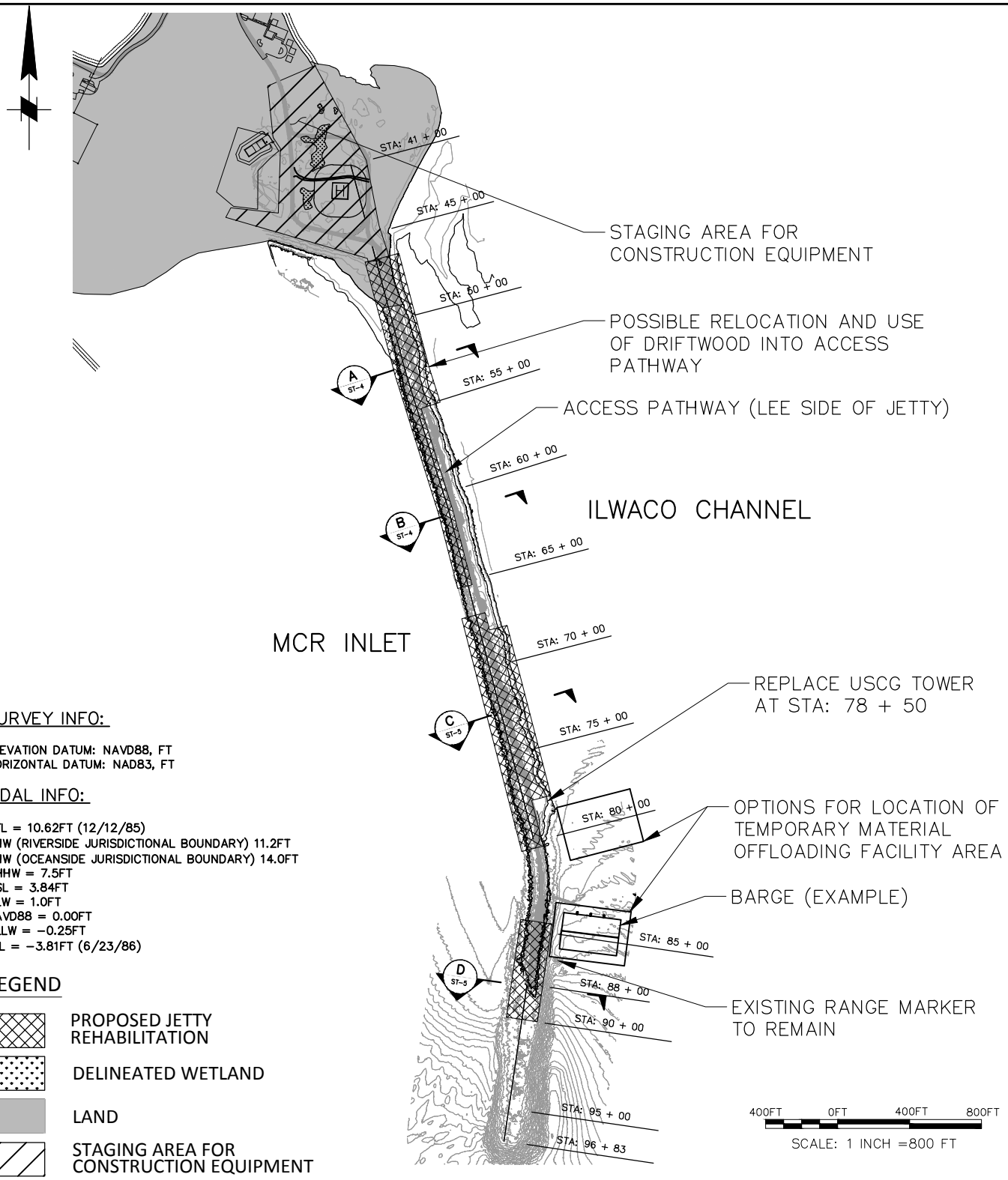
STATE : WASHINGTON
APPLICATION BY: U.S. ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT
SHEET 2 OF 9 DATE: APR 17, 2015



SURVEY INFO:

ELEVATION DATUM: NAVD88, FT
HORIZONTAL DATUM: NAD83, FT

TIDAL INFO:

HTL = 10.62FT (12/12/85)
OHW (RIVERSIDE JURISDICTIONAL BOUNDARY) 11.2FT
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MSL = 3.84FT
MLW = 1.0FT
NAVD88 = 0.00FT
MLLW = −0.25FT
LTL = −3.81FT (6/23/86)

LEGEND

- PROPOSED JETTY REHABILITATION
- DELINEATED WETLAND
- LAND
- STAGING AREA FOR CONSTRUCTION EQUIPMENT

PROPOSED JETTY REHABILITATION – PLAN VIEW

DATUM: NAVD88
ADJACENT PROPERTY OWNERS OF RECORD:

① STATE OF WASH. PARKS & REC.
② U.S. COAST GUARD
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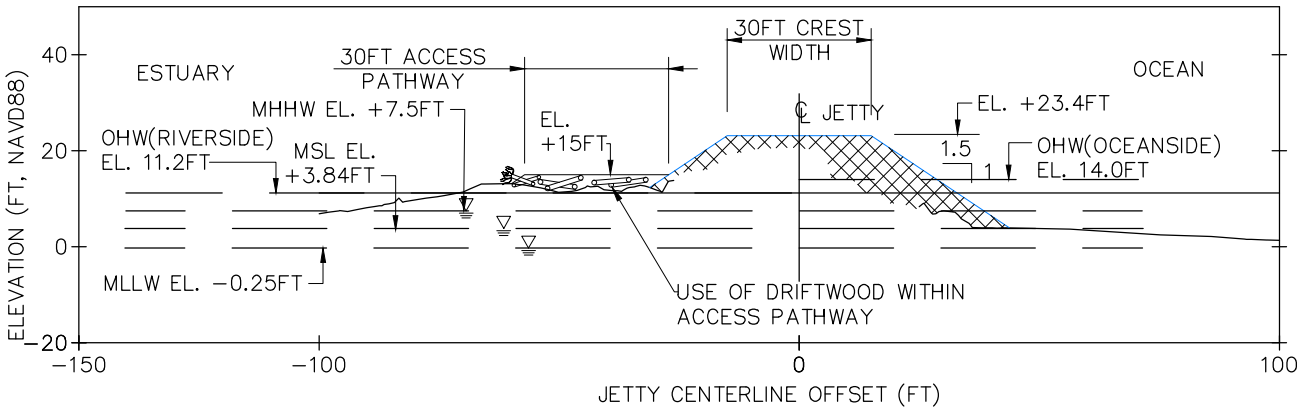
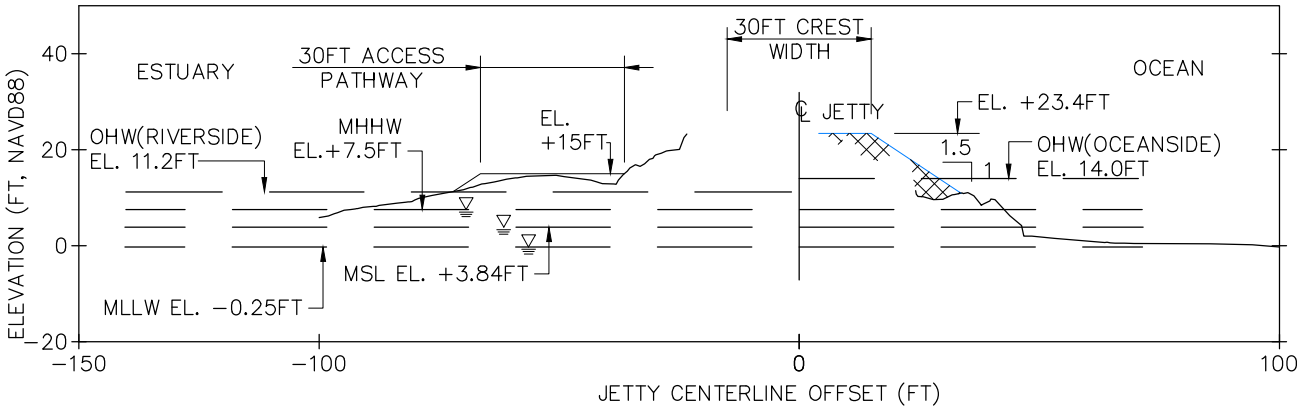
APPLICATION BY: U.S. ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT

 DATE: APR 17, 2015



TYPICAL JETTY TRUNK (A)

SHOWN: STA 52+50



TYPICAL JETTY TRUNK (B)

SHOWN: STA 60+00

DATUM: NAVD88

ADJACENT PROPERTY OWNERS OF RECORD:

① STATE OF WASH. PARKS & REC.
② U.S. COAST GUARD
③ WASH. STATE DEPT. OF NATURAL RESOURCES

PROPOSED JETTY A REHABILITATION
PURPOSE: TO STRENGTHEN THE JETTY A STRUCTURE
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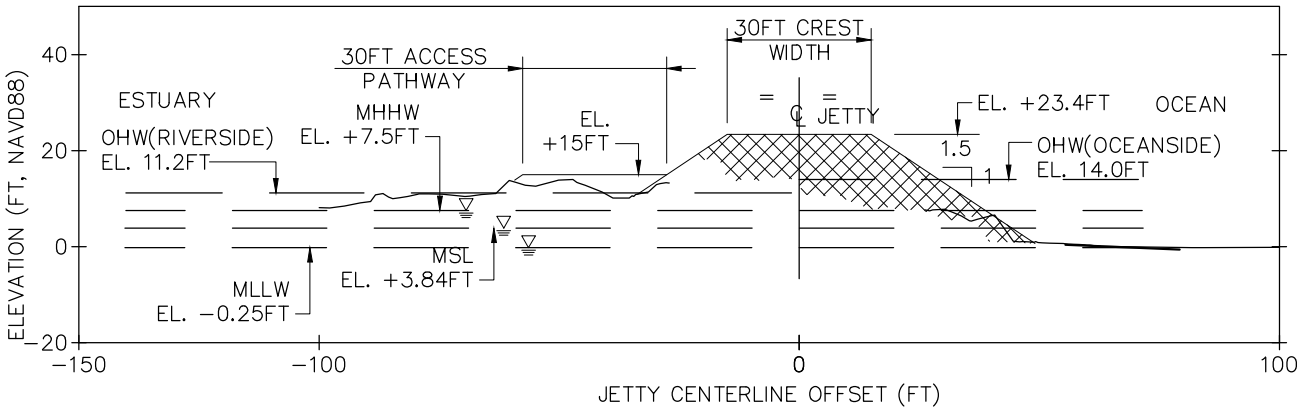
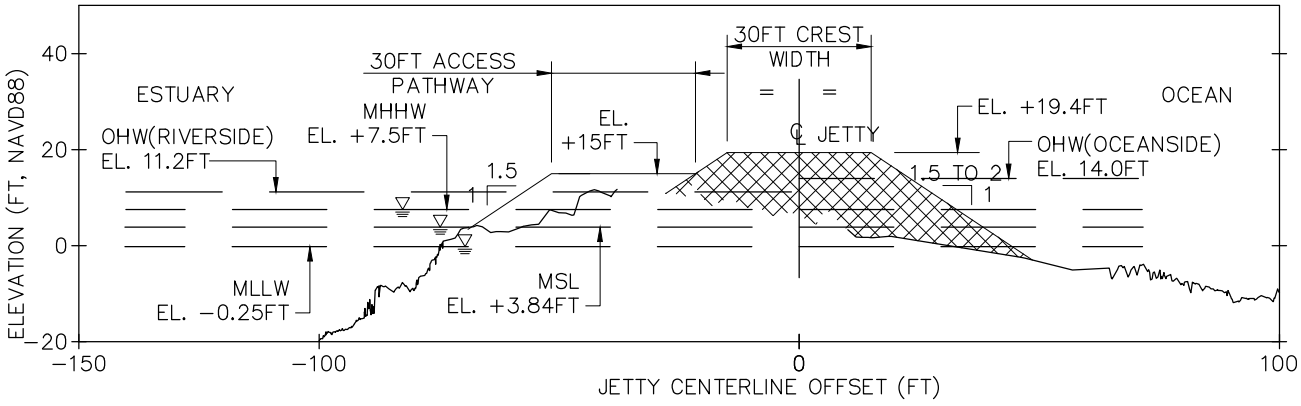
CITY & COUNTY : NEAR ILWACO, PACIFIC COUNTY
STATE : WASHINGTON
APPLICATION BY: U.S. ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT



TYPICAL JETTY TRUNK (C)

SHOWN: STA 73+00



LEGEND

FILL

TYPICAL JETTY HEAD (D)

SHOWN: STA 88+00

CROSS SECTIONS

20FT 0FT 20FT 40FT

SCALE: 1 INCH =40 FT

DATUM: NAVD88

ADJACENT PROPERTY OWNERS OF RECORD:

① STATE OF WASH. PARKS & REC.
② U.S. COAST GUARD
③ WASH. STATE DEPT. OF NATURAL RESOURCES

PROPOSED JETTY A REHABILITATION
PURPOSE: TO STRENGTHEN THE JETTY A STRUCTURE
IN: MOUTH OF COLUMBIA RIVER, USCG CAPE DISAPPOINTMENT
CITY & COUNTY : NEAR ILWACO, PACIFIC COUNTY
STATE : WASHINGTON
APPLICATION BY: U.S. ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT

NOTES

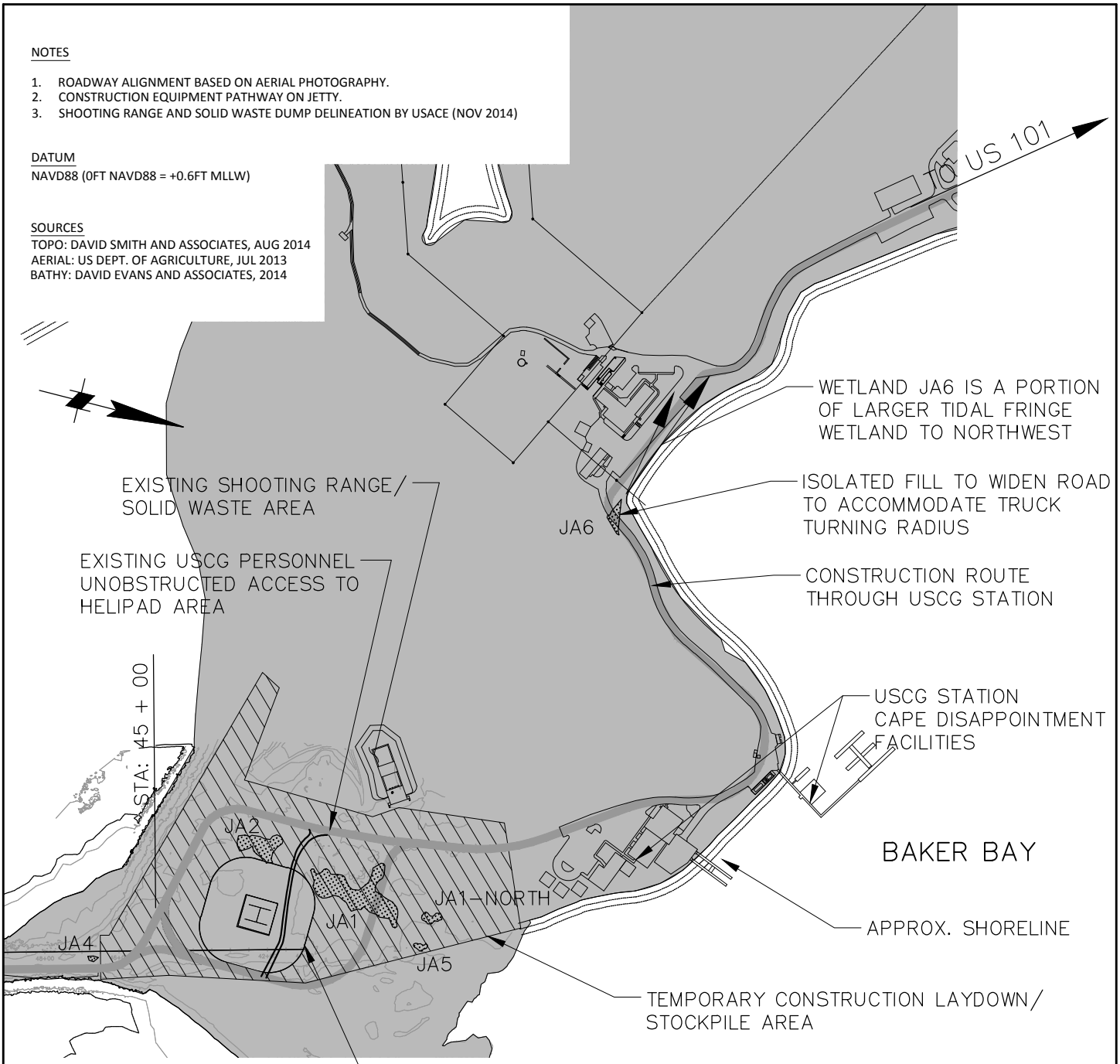
1. ROADWAY ALIGNMENT BASED ON AERIAL PHOTOGRAPHY.
2. CONSTRUCTION EQUIPMENT PATHWAY ON JETTY.
3. SHOOTING RANGE AND SOLID WASTE DUMP DELINEATION BY USACE (NOV 2014)

DATUM

NAVD88 (0FT NAVD88 = +0.6FT MLLW)

SOURCES

TOPO: DAVID SMITH AND ASSOCIATES, AUG 2014
AERIAL: US DEPT. OF AGRICULTURE, JUL 2013
BATHY: DAVID EVANS AND ASSOCIATES, 2014



LEGEND

DELINEATED WETLAND

LAND

200FT 0FT 200FT 400FT

SCALE: 1 INCH =400 FT

ROAD ACCESS AND STAGING FOR CONSTRUCTION EQUIPMENT

DATUM: NAVD88
ADJACENT PROPERTY OWNERS OF RECORD:

① STATE OF WASH. PARKS & REC.
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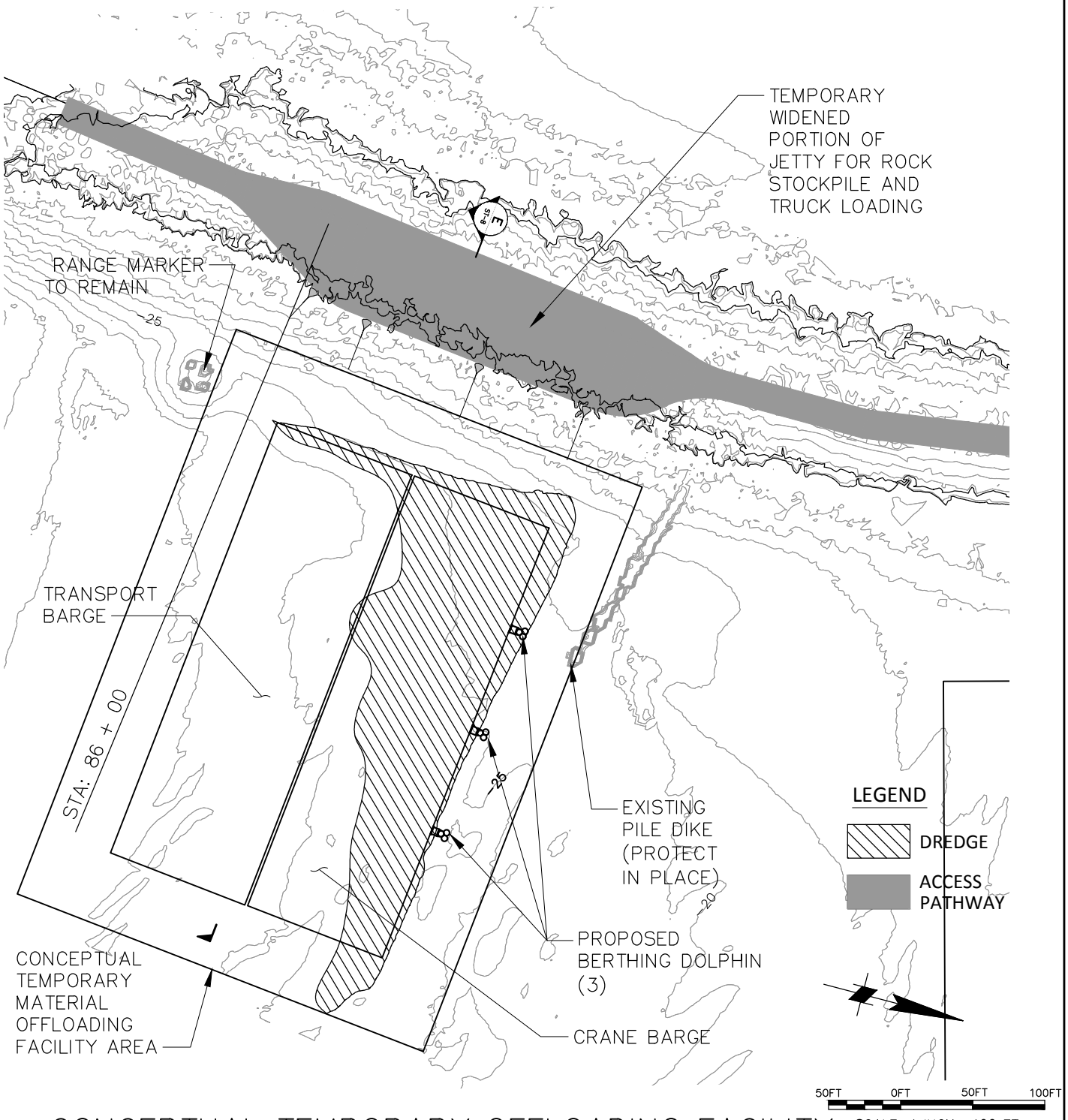
CITY & COUNTY : NEAR ILWACO, PACIFIC COUNTY
STATE : WASHINGTON
APPLICATION BY: U.S. ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT

 DATE: APR 17, 2015



CONCEPTUAL TEMPORARY OFFLOADING FACILITY

SCALE: 1 INCH= 100 FT

DATUM: NAVD88

ADJACENT PROPERTY OWNERS OF RECORD:

① STATE OF WASH. PARKS & REC.
② U.S. COAST GUARD
③ WASH. STATE DEPT. OF NATURAL RESOURCES

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CITY & COUNTY : NEAR ILWACO, PACIFIC COUNTY
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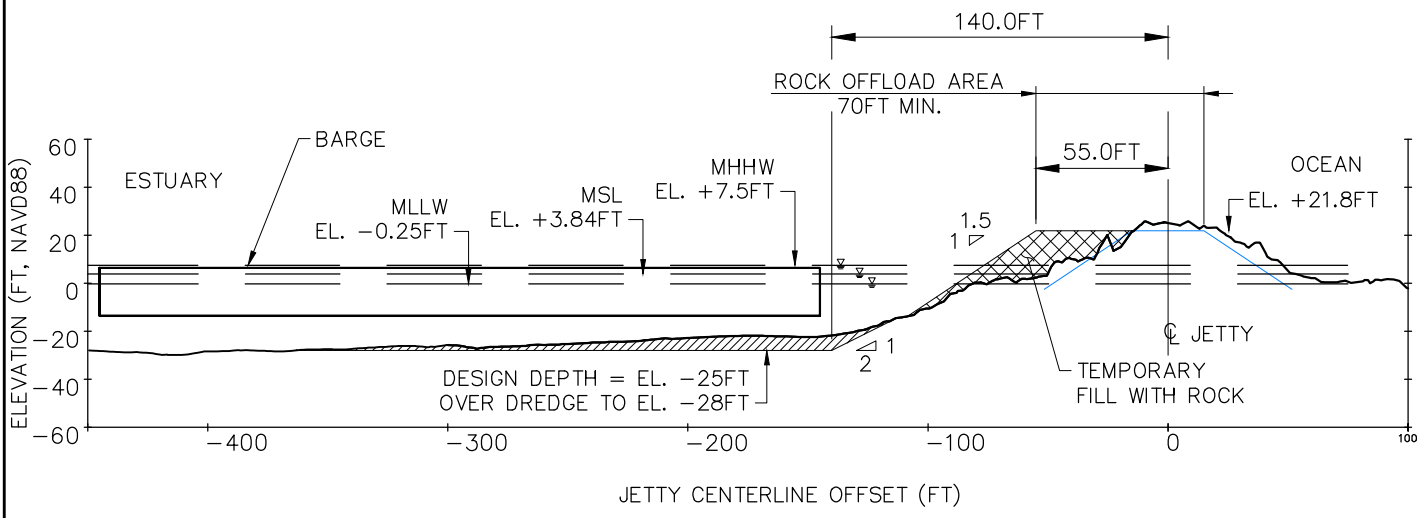

TYPICAL DREDGE CUT @ OFFLOADING FACILITY

E
ST-7

SHOWN: STA 84+00

LEGEND

FILL

DREDGE

40FT 0FT 40FT 80FT

SCALE: 1 INCH =80 FT

DATUM: NAVD88

ADJACENT PROPERTY OWNERS OF RECORD:

① STATE OF WASH. PARKS & REC.
② U.S. COAST GUARD
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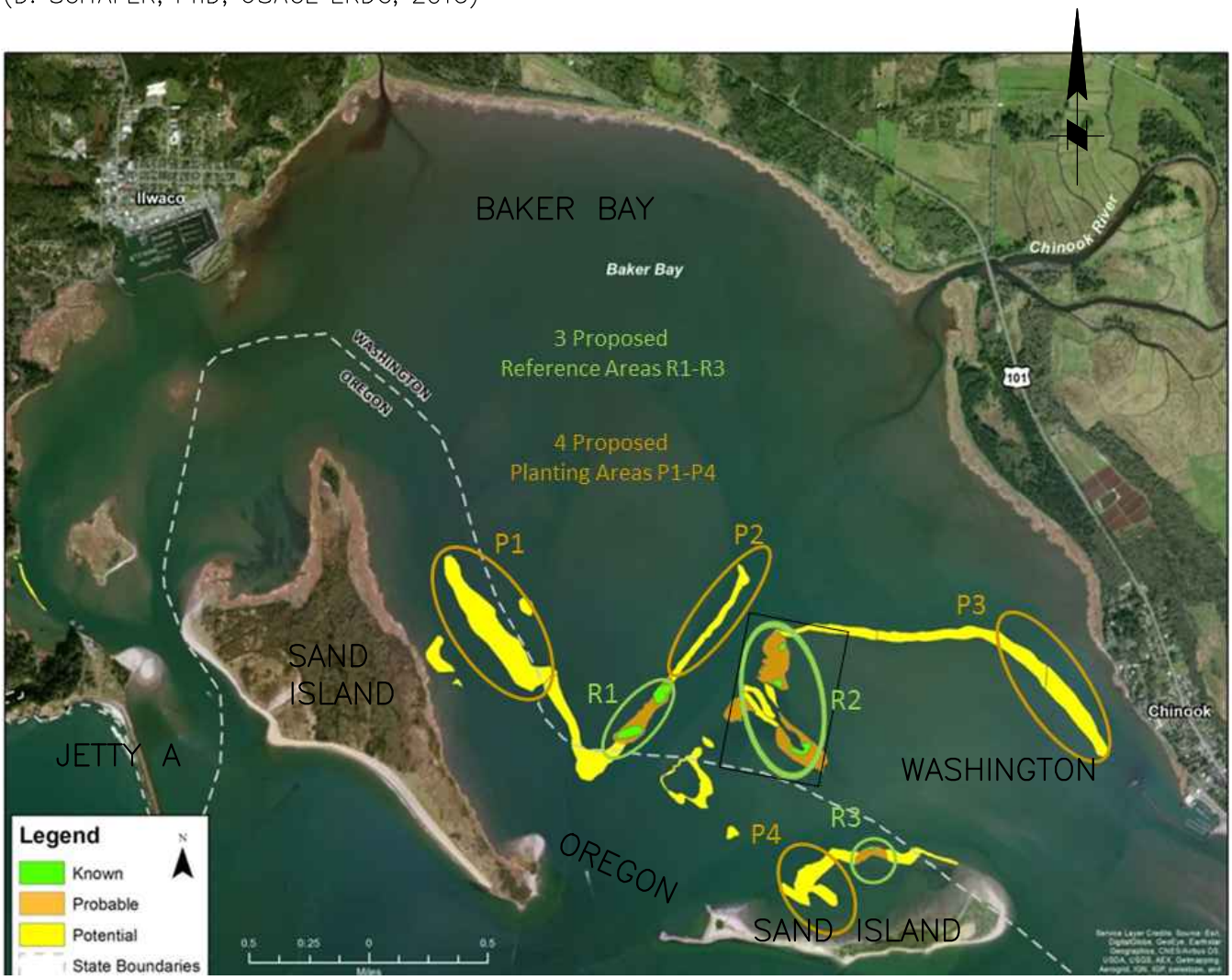
 DATE: APR 17, 2015

(D. SCHAFER, PhD, USACE ERDC, 2015)



POTENTIAL SEAGRASS ESTABLISHMENT AREA FOR WATERS MITIGATION – PLAN VIEW

DATUM: NAVD88
ADJACENT PROPERTY OWNERS OF RECORD:
① STATE OF WASH. PARKS & REC.
② U.S. COAST GUARD
③ WASH. STATE DEPT. OF NATURAL RESOURCES

PROPOSED JETTY A REHABILITATION
PURPOSE: TO STRENGTHEN THE JETTY A STRUCTURE
IN: MOUTH OF COLUMBIA RIVER, USCG CAPE DISAPPOINTMENT
CITY & COUNTY : NEAR ILWACO, PACIFIC COUNTY
STATE : WASHINGTON
APPLICATION BY: U.S. ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT
SHEET 9 OF 9 DATE: APR 17, 2015

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JARPA Appendix G
Jetty A Proposed Bank Use Plan

For
Rehabilitation of Jetty A
Near the Mouth of the Columbia River, Pacific County, Washington

Submitted by the U.S. Army Corps of Engineers, Portland District,
Civil Works

US Army Corps of Engineers
Portland District

April 2015

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US Army Corps of Engineers ®
Portland District

Proposed Bank Use Plan

Mouth of the Columbia River
Jetty A Rehabilitation Project

March 2015

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LIST OF TABLES

LIST OF FIGURES

PROPOSED BANK USE PLAN FOR THE MCR JETTY A REHABILITATION PROJECT

Laws relating to development of this Bank Use Plan and other documents associated with permitting for the Jetty A Rehabilitation Project include the following:

- Clean Water Act (33 USC §§ 1251 et seq.)
- National Environmental Policy Act (42 USC §§ 4321 et seq.)
- Council on Environmental Quality Procedures for Implementing the National Environmental Policy Act (40 CFR Parts 1500-1508)
- Executive Order 11990 (Protection of Wetlands)

1.0 PROJECT DESCRIPTION

The U.S. Army Corps of Engineers (USACE), Portland District, has proposed major rehabilitation and repair of Jetty A, which along with the North and South Jetties, is part of the USACE mouth of the Columbia River (MCR) navigation project. Portions of the jetty system have substantially degraded since its construction in 1939, and damage has increased in recent years because of increased storm activity and ongoing loss of sand shoal material upon which the jetties are constructed. The jetty was constructed to direct river and tidal currents away from the downstream North Jetty. Various repairs have been performed over the years to restore the height and width of the crest. Originally 1.1 miles in length, the length of the jetty has been reduced by approximately 900 feet since its construction, and without action is expected to continue to deteriorate at a rate of 5 to 20 feet per year (USACE 2012a). The proposed rehabilitation project is of critical importance to maintaining the Federal Navigation Channel at the MCR and assuring continued passage of marine traffic.

Rehabilitation activities at Jetty A would result in unavoidable impacts to wetlands and waters of the United States protected under Section 404 of the Clean Water Act. The USACE proposes to use wetland mitigation bank credits to compensate for project-related losses of wetland area and functions. This Bank Use Plan describes the proposed project, identifies wetland impacts, and describes how purchase of wetland mitigation bank credits will provide sufficient compensation for those impacts. Mitigation for impacts to waters of the United States is addressed in a separate document.

Project effects and proposed avoidance, minimization, and mitigation measures for the project are discussed at a general level in the Environmental Assessment (EA) and 404 (b) (1) Evaluation for the Rehabilitation of the Jetty System at the Mouth of the Columbia River that were prepared by the USACE in 2012 (USACE 2012a, 2012b). These documents are incorporated herein by reference.

1.1 PROJECT SETTING

Jetty A is located near Cape Disappointment State Park, on the Long Beach Peninsula, in Pacific County, Washington (Figure 1).

Figure 1. Jetty A location map. Red arrow indicates general location of proposed construction staging area.

The jetty is on USACE-owned property that is leased to the U.S. Coast Guard (USCG) for operations of its facility. The jetty is a rubble-mound structure constructed on an existing tidal shoal with a crest elevation ranging from 20 to 24 feet North American Vertical Datum of 1988 (NAVD88) and a crest width ranging from 10 to 40 feet. It extends approximately 1 mile south into the mouth of the Columbia River and, along with the North and South jetties, helps to stabilize the navigational channel, reduce the need for dredging, and provide protection for vessels (USACE 2012a).

The area proposed for construction staging consists of approximately 12 acres of the jetty root, between the jetty trunk to the south and the USCG station to the north (Figure 2). The upper terrace is partially filled and graded for use as a heliport. A historical solid waste dump and shooting range is located to the west of the heliport,

and the western edge of the upper terrace is topographically limited by steep bluffs. Public access is prohibited.

The upper terrace is underlain by consolidated fill material (primarily broken rock and gravels) and is dominated by grasses and forbs, with a few patches of Hooker willow (*Salix hookeriana*). This area appears regularly disturbed by existing land uses. The site drops to the east to a lower terrace, which consists of a mix of native and non-native vegetation and likely represents conditions prior to placement of fill in the upper terrace (Tetra Tech 2011). The July 2012 aerial photograph (Figure 2) of the study area reflects current site conditions, with the exception of the rapidly receding southeastern shoreline and the slow erosion of the southwestern bank. The southeastern shoreline along the Columbia River is incrementally eroding in a northwesterly direction towards the low bench area. In the last 20 years, approximately 870 feet of low vegetated terrace has eroded, turning that area into unvegetated shallow waters and sandy beaches (USACE 2015). The rate of erosion has varied over time but has not abated due to the sandy nature of the low terrace and beach. The southwestern bank that is directly exposed to ocean storm events and strong river currents has receded approximately 90 feet since 1996. This erosion is lesser due to armoring by large diameter basalt boulders and the compacted nature of the upper terrace.

Figure 2. Jetty A study area (Source: USACE 2015)

1.2 JETTY A CONSTRUCTION ACTIVITIES

The rehabilitation activities at Jetty A would include construction access and staging improvements, rock fill along the jetty, and possible dredging and construction of a

barge off-loading facility. Approximately 11.7 acres of land between the jetty and the Cape Disappointment USCG facility have been identified as suitable for offloading, staging, and stockpiling of construction-related equipment and material. The area would be levelled, cleared of vegetation, and resurfaced with gravel material. These activities would permanently fill five Category III wetland areas and their associated wetland buffers. Additionally, improvements for the USCG entrance road (i.e., widening, resurfacing) would result in temporary impacts to a small portion of a Category I estuarine wetland.

2.0 EXISTING CONDITIONS OF WETLANDS AND WETLAND BUFFERS

A wetland delineation of the jetty root area completed in 2011 originally documented three wetland areas (Wetlands JA1, JA2, and JA3) totaling 0.91 acre (Tetra Tech 2011). Wetlands on-site were also classified and given a rating score in accordance with the Washington State Department of Ecology (Ecology) *Washington State Wetland Rating System for Western Washington – Revised* (Hruby 2004). Ecology concurred with the delineation, with some minor revisions, after a field visit on March 28, 2014 (pers. comm., Richard Mraz, April 30, 2014). In its concurrence, Ecology noted that one of the wetlands identified in the delineation (Wetland JA3) could not be located.

In December 2014, USACE Portland District wetland specialists revisited the site to investigate an expanded study area, update wetland ratings using the new 2014 wetland rating system for western Washington, and to document changes to the site that have occurred since Tetra Tech's 2011 study, particularly along the western shoreline where beach conditions have been altered by natural fluvial processes of sediment erosion and deposition. Based on data collected during the visit, the USACE made a number of modifications to the original delineation study:

- The boundary of Wetland JA1 was refined, reducing the wetland size from 0.61 to 0.34 acre.
- A small (1,100 square feet [ft^2], or 0.03 acre) depression previously thought to connect to Wetland JA1 through a shrubby area was determined to be isolated and was given a unique wetland name (JA1-North, or JA1N).
- Wetlands JA1 and JA2, called forested wetlands in the 2011 study, were reclassified as emergent wetlands because they do not meet the definition of forested wetland per Cowardin et al. (1979).
- Wetlands JA1 and JA2 functions were re-evaluated using Ecology's 2014 updated rating system, which increased the rating of both wetlands from Category IV to Category III.
- Two additional depressional wetlands, JA4 and JA5, were documented on the upper terrace.

- An estuarine tidal fringe wetland (JA6) was documented between the USCG entrance road and Baker Bay.
- Wetland JA3, previously identified in 2011, was confirmed to no longer exist; the area has since been filled in by natural alluvial processes. The area is currently dominated by beach grass, and hydric soils and sufficient wetland hydrology are lacking.

An updated delineation report has been prepared and submitted to Ecology for approval (USACE 2015). The report includes an evaluation of wetland functions and values using the updated Ecology rating system for western Washington (Hruby 2014). Delineated wetlands and their associated buffers are shown on Figure 3.

Figure 3. Jetty A wetland delineation map

Six wetlands were delineated within the Jetty A project limits during a site visit conducted by the USACE in December 2014. These wetlands are summarized in Table 1 and described briefly below.

Table 1. Jetty A Wetlands

Wetland ID	Wetland Area (acre)	Buffer Width (feet)[1]	Category	Classification	
				Cowardin	HGM
JA1	0.34	50	III	Palustrine emergent	Depressional
JA1N	0.03	50	III	Palustrine emergent	Depressional
JA2	0.12	50	III	Palustrine emergent	Depressional
JA4	< 0.01	50	III	Palustrine emergent	Depressional
JA5	0.01	50	III	Palustrine emergent	Depressional
JA6	0.04	100	I	Estuarine intertidal emergent persistent	Estuarine salt water tidal fringe

[1] Per Pacific County Code 147, 147A.

Wetlands JA1, JA1N, JA2, JA4, and JA5 are non-tidal wetlands formed on top of historical fill in the upper terrace. The wetlands receive water exclusively by precipitation and runoff from higher upland areas. Using the U.S. Fish and Wildlife Service (USFWS) wetland classification system (Cowardin et al. 1979), all of these wetlands are considered palustrine emergent (PEM) wetlands. Plant communities are dominated by slough sedge (*Carex obnupta*), common velvetgrass (*Holcus lanatus*), saltgrass (*Distichlis spicata*), sword fern (*Polystichum munitum*), and rushes (*Juncus* spp.).

The Natural Resources Conservation Service web soil survey (NRCS 2015) indicates that the majority of the project area is underlain by dune land (map unit 35), which has a typical profile of 0-60 inches of fine sand. However, the non-tidal wetlands documented at the site are situated on a historically filled terrace; soils were generally low chroma sandy/gravelly loam or rock fill (USACE 2015). Hydric soil indicators S1 (sandy mucky mineral), F3 (depleted matrix), and A4 (hydrogen sulfide) were observed in some wetland test pits, but indicators were absent in others. Where redoximorphic features or other hydric soil indicators were missing, hydric soils were assumed to be present if hydrophytic plants were dominant and hydrologic indicators could be identified.

According to the 2014 Ecology rating system, the five nontidal wetlands identified within the project area are classified as Category III wetlands. In Pacific County, Category III wetlands require a minimum 50-foot buffer (Pacific County Code 147, 147A). The wetlands provide a moderate level of function in terms of water quality, hydrology, and

habitat benefits; however, the functions of these wetlands are limited by their small size; lack of opportunity to provide water quality or hydrologic functions; and lack of habitat features and vegetative diversity. The wetlands are small, isolated depressions formed on a compacted and disturbed fill terrace. Their small size limits the capacity to provide for flood attenuation. They also likely have little impact on recharging the aquifer or affecting the groundwater table, because they are located at the lowest point in the drainage basin and just above sea level. Wetland buffers are generally disturbed by existing land uses (e.g., mowing, vehicle use), and are dominated by non-native species such as Scot's broom (*Cytisus scoparius*), Himalayan blackberry (*Rubus armeniacus*), and English ivy (*Hedera helix*).

Wetland JA6 was outside the 2011 wetland study area. The wetland is classified by the USFWS as Estuarine Intertidal Emergent, persistent (E2EM1). The portion of tidal fringe wetland area that is within the study area is approximately 1,650 ft^2 and is located waterward of the USCG access road and main buildings and downslope of the mowed and maintained road right-of-way (Figure 4). Wetland JA6 is hydrologically fed by a 24-inch concrete culvert under the road and by tidal fluctuations in Baker Bay. The upper fringe of the wetland that will be affected by road widening is dominated by reed canary grass (*Phalaris arundinaceae*). The wetland is a part of much larger tidal fringe wetland that extends to the northwest. Further from shore, the wetland vegetation shifts to intertidal mudflats.

Figure 4. Looking northwest at Wetland JA6 (Source: USACE 2015)

Ecology's rating system categorizes estuarine wetlands based on "Special Circumstances" but does not characterize their functions. Because the larger wetland that JA6 is a part of is an estuarine wetland that extends into State Park property, it automatically rates as a Category I wetland, which requires a 100-foot buffer in Pacific County. However, functionally, the upper fringe of JA6 that will be temporarily impacted by project activities likely has a low-to-moderate capacity to provide water quality, hydrologic, and habitat functions. The wetland contains dense emergent vegetation, which can help trap sediment and filter pollutants, but the site is sloped, which decreases the retention time for surface water and the potential for retaining sediments and associated pollutants. The affected portion of Wetland JA6 provides minimal, if any, flood storage, runoff, or infiltration benefit or groundwater recharge. Habitat value in

JA6 is limited by the dominant presence of non-native vegetation, and its location adjacent to the USCG access road, a paved parking area, and a mowed and landscaped road right-of-way.

3.0 AVOIDANCE AND MINIMIZATION OF IMPACTS ON WETLANDS

The project design for rehabilitation of Jetty A has been developed and refined to take advantage of opportunities to avoid and minimize, to the maximum extent practicable, the project's ecological impacts to wetlands, aquatic habitats, and species pursuant to impact avoidance and minimization requirements under the Clean Water Act and Executive Order No. 11990. Efforts were made to reduce the project footprint to the extent practicable, while providing safe access to the site and sufficient clearance for the helipad, material staging, and truck access and turnaround area. Additionally, the USACE minimized impacts to adjacent waters of the U.S. by placing all staging and stockpiles above Mean Higher High Water and limiting project work on areas below the Mean Higher High Tide elevation. However, impacts to the six wetlands identified on the site are unavoidable as this area is necessary for construction access, material delivery, staging, and construction laydown.

The need for safe and clear access for large machinery will require temporary improvements (i.e., widening, resurfacing) to the USCG entrance road. Permanent impacts to Category I estuarine wetland will be avoided by removing any imported road fill from the estuarine wetland site following construction and restoring all temporary impacts to pre-construction condition. Temporary impacts at Wetland JA6 would be mitigated via post-construction restoration, which would include the following actions:

- Remove temporary fill
- Restore disturbed soil to pre-construction topography
- Seed with native emergent species adapted to the intertidal zone
- Cover bare soil with biodegradable erosion control fabric anchored with wood stakes
- Plant willow cuttings from nearby native shrubs

Because the wetland is currently dominated by non-native, invasive reed canarygrass, restoration activities may ultimately improve the condition of the site. Wetland JA6 would be restored to pre-construction condition within 2 years. Because impacts are considered temporary, no additional compensatory mitigation is proposed.

4.0 UNAVOIDABLE WETLAND IMPACT ACREAGE

Tables 2 and 3 summarize permanent and temporary wetland impacts resulting from the proposed jetty rehabilitation. Impacts are summarized by acreage, Ecology rating,

and Cowardin and hydrogeomorphic (HGM) classifications. Project activities at Jetty A would result in 0.51 acre of permanent impacts to Category III PEM wetland and 1.9 acres of permanent impacts to Category III wetland buffers from clearing, grubbing, and resurfacing to create a staging area for material stockpiling and construction laydown. Wetlands JA1, JA1N, JA2, JA4, and JA5, and their buffers, would be permanently filled. Approximately 0.04 acre (1,650 ft^2) of Category I estuarine wetland would be temporarily filled by roadway improvements. Following construction, imported road fill would be removed from the estuarine wetland site and all temporary impacts would be restored to pre-construction condition. No indirect impacts are anticipated.

Table 2. Anticipated Wetland Impacts

Wetland ID	Wetland Area (ac.)	Permanently Filled Wetland Area (ac.)	Temporarily Impacted Wetland Area (ac.)	Indirect Impact Area (ac.)	Ecology Rating	Cowardin Classification	HGM Classification
JA1	0.34	0.34	--	--	III	PEM	Depressional
JA1N	0.03	0.03	--	--	III	PEM	Depressional
JA2	0.12	0.12	--	--	III	PEM	Depressional
JA4	0.01	0.01	--	--	III	PEM	Depressional
JA5	0.01	0.01	--	--	III	PEM	Depressional
JA6	0.04	--	0.04	--	I	E2EM1	Estuarine salt water tidal fringe

Table 3. Impact Summary by Classification

Classification System	Class	Area of Permanent Impacts	Area of Temporary Impacts	Area of Indirect Impacts
Ecology Rating	I	--	0.04	--
	III	0.51	--	--
Cowardin	E2EM1	--	0.04	--
	PEM	0.51	--	--
HGM	Estuarine	--	0.04	--
	Depressional	0.51	--	--

5.0 IMPACTED WETLAND FUNCTIONS

The following discussion summarizes the basis for water quality, hydrologic, and habitat function scores assigned to wetlands that would be impacted by project construction. As mentioned above, the wetland rating system for western Washington does not characterize estuarine wetland functions, but an evaluation of Wetland JA6 water quality, hydrologic, and habitat functions is also provided below using a similar approach but based upon best professional judgment.

5.1 WATER QUALITY FUNCTIONS

The Jetty A nontidal wetlands provide moderate water quality functions. The wetlands are isolated (lack a surface water outlet) and contain persistent vegetation, which provides a vertical structure to trap or filter out pollutants. However, the wetlands support only limited seasonal inundation, which limits their capacity for nutrient removal. They also lack the opportunity to improve water quality, as their contributing basins are generally undeveloped. The jetty root is currently used by the USCG for training exercises, but is not accessible to the public, so the existing graveled access roads crossing the site are not highly travelled and the potential for a high volume of runoff with any detectable pollutant load is minimal.

Wetland JA6 also provides moderate water quality functions. The wetland fringe is densely vegetated, which may assist in trapping sediments from both tidal and freshwater inputs. The wetland also directly abuts a paved parking area and road, so it likely receives direct stormwater runoff. However, the wetland is sloped, so there is no ponding and water retention times are limited.

5.2 HYDROLOGIC FUNCTIONS

The non-tidal wetlands also have a moderate capacity to provide hydrologic functions. The wetlands are shallow, isolated depressions with ponding depths ranging from 0 to 6 inches. The primary source of hydrology to these wetlands is precipitation, which perches on the compacted fill substrate. The wetlands also receive runoff from surrounding uplands; however, adjacent uplands are generally undeveloped and densely vegetated, so runoff is neither excessive nor does it quickly drain to the wetlands. Therefore, the Jetty A wetlands lack the opportunity to provide hydrologic functions. Additionally, the wetlands' location at the lowest point in the watershed and in a location without development limits their opportunity to provide flood storage benefit.

Because Wetland JA6 is the sloped upper edge of a larger estuarine wetland, it provides minimal, if any, flood storage, runoff, or infiltration benefit or groundwater recharge. The dense vegetation may help dissipate wave energy, but the wetland fringe is narrow, which reduces its effectiveness at tidal surge attenuation.

5.3 HABITAT FUNCTIONS

The Jetty A nontidal wetlands provide moderate habitat functions. Overall, the wetlands are located in a relatively undisturbed setting with a high percentage of accessible habitats. Additionally, the wetlands are in proximity to three identified priority habitats (riparian, nearshore, snags and logs). However, individually, the Jetty A wetlands provide limited functional habitat, compared to the larger Long Beach Mitigation Bank (LBMB) wetland. The wetlands lack extensive ponding that would provide breeding habitat for amphibians and support for waterbirds. Very little woody vegetation is present that would provide cover or forage for songbirds. Additionally, the wetlands' lack of native species richness, habitat interspersion, and habitat features limits the number of ecological niches available for wetland-dependent species.

The portion of Wetland JA6 that will be temporarily impacted by road improvements provides limited habitat functions. The wetland is densely vegetated, but vegetation is predominantly non-native and does not contain woody vegetation that would provide cover or forage for wetland-dependent species. Within the affected area, at the upper edge of the intertidal zone for Baker Bay, no ponding is present that would support ducks or geese, and the wetland does not contain open mudflats that would provide feeding habitat for shorebirds. The wetland does provide emergent cover for resident and migratory fish moving along the shoreline at high tide, but the affected area would not diminish the general suitability of the area for this habitat function. The upland buffer above Wetland JA6 is developed as a paved parking area and mowed and landscaped road right-of-way.

6.0 WETLAND MITIGATION SITE SELECTION RATIONALE

To provide adequate mitigation, the USACE assessed on-site or nearby, in-kind replacement of wetland functions and values as well as off-site wetland mitigation bank options.

6.1 ON-SITE OR NEARBY, IN-KIND MITIGATION

Based on site configuration and existing and proposed future conditions, the USACE determined that on-site compensatory mitigation for permanent wetland impacts is not feasible. The Jetty A site is situated on a narrow peninsula. Area available for wetland mitigation is extremely limited by existing land uses and proximity of the Columbia River to the east and sea bluffs and ocean to the west. The proposed project will permanently fill all the existing wetlands at the site; therefore, wetland restoration, rehabilitation, or re-establishment are not viable options.

The USACE next evaluated opportunities to provide off-site, in-kind mitigation, by enhancing or creating wetlands at a nearby location. A suitable mitigation area was

identified at the North Jetty, approximately 1.5 miles west of the Jetty A impact area. However, the USACE concluded that wetland creation at the North Jetty is not preferable, based on the following considerations:

- The mitigation site would be located within a State Park, where the primary purpose is recreation; wetland mitigation that excluded site access would not be consistent with park management goals and objectives. It would also require a modification of the lease with the Washington State Parks Commission.

- Wetlands at the North Jetty are exposed to recreational use under existing conditions, and any wetlands that might be enhanced or created on-site would also be exposed to recreational disturbance that would reduce functions and values. The wetlands are also in proximity to both the paved Jetty Road used to access Benson Beach and a gravel road that provides access to the parking lot used for horse trailers and additional parking.

- The North Jetty site may be used as a staging area for future phases of the North Jetty Repair Project (scheduled for 2016-2019), and any wetlands that might be enhanced or created on-site would be exposed to potential construction disturbance that would reduce functions and values.

6.2 MITIGATION BANKING

The USACE next looked outside the project area for mitigation bank opportunities. As defined by the 1995 federal guidance on wetland mitigation banking and state law (Chapter 90.84 RCW), mitigation banking is “wetland restoration, creation, enhancement, and in exceptional circumstances, preservation undertaken expressly for the purpose of compensating for unavoidable wetland losses in advance of development actions, when such compensation cannot be achieved at the development site or would not be as environmentally beneficial."

Mitigation bank site selection was guided by relevant federal and state regulations and guidelines, including *Compensatory Mitigation for Losses of Aquatic Resources* (USACE and EPA 2008), and *Selecting Wetland Mitigation Sites Using a Watershed Approach* (Hruby et al. 2009). The selection criteria included geographic proximity to the project, size adequate to provide mitigation, zoning and land ownership that would protect wetlands over time, and site characteristics that would be the same or similar in terms of Cowardin et al. (1979) classification and Ecology category, with the same or higher wetland functions.

6.2.1 Long Beach Mitigation Bank

One mitigation bank is currently approved to sell wetland mitigation credits in the vicinity of Jetty A. The LBMB is located near Oceanside, Washington, on the Long Beach Peninsula, within a mature interdunal wetland complex that extends along the length of

the Long Beach Peninsula (Figure 5). The bank currently has several credits available for purchase and could provide mitigation credit for permanent impacts to wetlands JA1, JA1N, JA2, JA4, and JA5 and their associated protective upland buffer areas.

The LBMB is located in tax parcels 74049901000 and 74049908000, in the southeast quarter of Section 28, Township 11 North, Range 11 West (Willamette Meridian). It is approximately 8 miles north of Jetty A. The 76-acre bank is generally flat with a closed, depressional, 2.59-acre Category II wetland in the western portion of the site surrounded by upland forest. Vegetation within this wetland and associated upland buffer consists of a mature conifer and deciduous forest with an understory of shrubs and herbaceous species. The remainder of the site consists of a portion of the large Category I wetland. The dune ridge and interdunal topography has created hydroperiods that range from saturated to permanently inundated and vegetative classes that include forested, scrub-shrub, emergent, aquatic bed, and bog areas.

The LBMB is a preservation bank that is intended to provide wetland mitigation credits for impacts to depressional wetlands within the Long Beach service area by preserving the western wetland, the on-site portion of the Category I wetland, and high quality forested uplands. Activities associated with the LBMB design include enhancement of on-site wetlands and uplands and control of invasive species.

As stated previously, the USACE has determined that the proposed project will permanently impact 0.51 acre of Category III PEM depressional wetland. The LBMB will provide appropriate credits for unavoidable project impacts on these wetlands for several reasons:

- The proposed project and the LBMB are located within the same Water Resource Inventory Area (WRIA 24) and within the same geographic area (Long Beach Peninsula).

- The project site is adjacent to the LBMB service area, and is connected by a relatively undisturbed, unbroken vegetated corridor that may serve as a habitat connection.

- The geomorphic settings and landforms of the project site and the LBMB are similar. Both are located in areas historically formed by dynamic accretion of fine sands. Neither the project site wetlands nor the LBMB wetland have a direct hydraulic connection (surface flow) to the ocean.

- The project site and the LBMB have similar wetland types. Both contain isolated, depressional PEM wetlands.

- Because the impact wetlands provide low to moderate functions and values, their loss will have very little effect on the availability of high quality wetland

functions within WRIA 24. The LBMB, by contrast, preserves high quality, large, contiguous wetland habitat within an important fly-over area for coastal birds.

In 2008, the Environmental Protection Agency and the USACE issued the joint *Final Rule for Compensatory Mitigation for Losses of Aquatic Resources* under Section 404 of the Clean Water Act (73 FR 19594). The final rule stated a preference for the use of mitigation banks, when available, over permittee-responsible on-site/off-site wetland mitigation for development projects. The USACE's Civil Works use of this approach is further supported by Section 2036 (c) of the 2007 Water Resources Development Act (Public Law 110-114) as well as 33 CFR 332.3(j)(1) and 40 CFR 230.93(j)(1).

6.2.2 Bank Service Area

A bank service area is defined as "the designated geographic area in which a bank can reasonably be expected to provide appropriate compensation for unavoidable impacts" (Ecology and USACE 2013). Service areas generally correspond with ecologically significant watershed boundaries, such as the WRIA boundaries identified by Ecology. The LBMB is located on the Long Beach Peninsula, just east of Oceanside, and is located within the Willapa Bay Basin (WRIA 24). The service area includes projects with palustrine and lacustrine wetland impacts on the coastal plain of the Long Beach Peninsula that drain to Willapa Bay or the Pacific Ocean or have no outlet.

The Jetty A project site is located less than 1 mile outside of the Bank service area and is also within WRIA 24 (Figure 5). There are currently no mitigation banks that service this area. As stated in Appendix E of the Mitigation Banking Instrument (MBI), "The Bank may be used to compensate for permitted impacts outside the service area if specifically approved by the appropriate agencies requiring mitigation and the USACE and Ecology, following consultation with the IRT [Interagency Review Team], provided that such mitigation would be practicable and environmentally preferable to other mitigation alternatives" (LBMB Inc. 2013)

The project site is located at the mouth of the Columbia River, bordered by the Pacific Ocean to the west and the Columbia River to the east; however, because all the impacted wetlands are small, isolated depressions with little storage capacity, they drain to neither and have little impact on aquifer or groundwater recharge. Therefore, from a watershed perspective, there is little difference between the impact area at Jetty A and other small, isolated, depressional wetlands included in the bank service area. Additionally, the proximity of the project site to the service area and the presence of a relatively undisturbed and unbroken vegetated corridor connection between the two may indicate a habitat connection, particularly for birds and mammals. For these reasons, the use of the Bank should be considered ecologically appropriate. It is also environmentally preferable to any other mitigation option, as the on-site and off-site mitigation options reviewed by the USACE were determined to be less preferable, as described above.

Figure 5. Long Beach Mitigation Bank service area, with yellow arrow showing location of wetland impacts (Source: LBMB Inc. 2013)

7.0 WETLAND FUNCTIONS PROVIDED AT THE PROPOSED MITIGATION BANK

The purchase of mitigation credits, in conjunction with the avoidance and minimization measures described in Section 3, will ensure that wetland functions and services lost at the project site will be more than compensated for within WRIA 24. The LBMB has credits approved by an interagency review team to compensate for Category III PEM wetlands, which can be used to offset permanent project impacts on Wetlands JA1, JA1N, JA2, JA4, and JA5.

The Category II wetland within the LBMB is similar to those that will be affected by the project in terms of Cowardin classification and HGM class; however, functional capacity described in the LBMB Mitigation Banking Instrument (LBMB, Inc. 2013) mostly exceeds that of the project-affected wetlands. The following sections describe the wetland functions provided at the Bank and compare them to those described for the impact wetlands at Jetty A (USACE 2015). Because the LBMB wetland was evaluated using the 2004 rating system, scores used to characterize water quality, hydrologic, and habitat functions are not analogous to scores assigned to the Jetty A wetlands using the 2014 system. Therefore, functions at each site are compared qualitatively, rather than by comparing numeric scores.

7.1 WATER QUALITY FUNCTIONS

Category II wetlands at the LBMB provide moderate to high water quality functions. Buffer areas also provide some level of water quality improvement. Like the impact wetlands, the LBMB wetland lacks a surface outlet and contains persistent vegetation throughout 95 percent or more of its area. However, the LBMB wetland supports a greater area of seasonal inundation and has the opportunity to improve water quality, since it receives runoff from roads and residences. The Jetty A wetlands lack extensive ponding, which limits their capacity for nutrient removal. They also lack the opportunity to improve water quality, as their contributing basins are generally undeveloped and the wetlands do not receive stormwater inputs or other pollutants from upgradient sources. Based on this comparison, the LBMB Category II wetlands would provide higher benefits to water quality.

7.2 HYDROLOGIC FUNCTIONS

The LBMB Category II wetland received a moderately low score for hydrologic functions. It has no outlet, there is ponding up to 2 feet in depth, the wetland's watershed is less than 10 times the area of the wetland, and the primary hydrologic source is the seasonally high water table. There is minimal opportunity for the LBMB wetland to provide hydrologic benefits because more than 90 percent of the water in the wetland is

estimated to come from groundwater in an area where damaging groundwater flooding does not occur. The Jetty A wetlands generally have the same characteristics as the LBMB wetland, except that hydrology is from precipitation and surface runoff. However, the surrounding landscape is generally undeveloped and does not generate excessive runoff, so the Jetty A wetlands lack the opportunity to provide hydrologic functions. Additionally, the small size of each wetland limits the overall capacity to provide flood attenuation. Therefore, the LBMB Category II wetlands would provide similar hydrologic functions as the Jetty A wetlands.

7.3 HABITAT FUNCTIONS

Habitat suitability for wildlife in the LBMB is moderately high because the wetland supports two vegetative classes and more than three strata and there are two hydroperiods (seasonally inundated and saturated). Plant species richness is moderate, and there is no interspersion of vegetative classes. Special habitat features include downed logs and standing snags, and invasive species occupy less than 25 percent of the area. Greater than 50 percent of the buffer is relatively undisturbed for a distance of 170 feet. There are undisturbed connections to wetlands and uplands at least 150 feet wide, with at least 30 percent cover of shrubs or forest that connect undisturbed wetlands and uplands of more than 250 acres. There are also more than three wetlands within 1 mile with relatively undisturbed connections. Priority habitats identified by WDFW include mature forests, and snags and down logs.

The LBMB will preserve wetland and upland wildlife corridors that have a wide range of hydroperiods and vegetation types that provide habitats and corridors for mammals, birds, waterfowl, fish, amphibians, reptiles, and invertebrates. Wildlife corridors are valuable for accessing areas of wetland or upland necessary for species to meet daily, seasonal, or life-cycle needs that require different habitat types. Corridors are also necessary to allow interbreeding between subpopulations that occupy different areas of the peninsula to maintain genetic variability.

8.0 WETLAND FUNCTIONS NOT MITIGATED AT WETLAND MITIGATION BANK

The UCACE Portland District will fully mitigate for wetland area and functions impacted by the proposed actions at Jetty A by purchasing compensatory mitigation bank credits and fully restoring temporarily impacted wetlands. Permanent impacts to Category III PEM wetlands will be mitigated by purchase of compensatory wetland mitigation credits from the LBMB. As described in previous sections, the wetland types, setting, and functions are very similar. The USACE does not anticipate unmitigated functions that are not addressed by purchasing bank credits or conducting appropriate site restoration.

9.0 PROPOSED MITIGATION CREDITS

The USACE is proposing to purchase 0.51 credits from the LBMB in compensation for the project's anticipated impacts on 0.51 acre of Category III PEM wetland, applying the ratio of 1 unit of credit per unit of Category III wetlands impact. These ratios are provisionally prescribed in Appendix E, Sections E.2 and E.3 and Table E.2 of the LBMB MBI (Table 4 below). Buffer impacts are mitigated at 20 percent of the ratio for each category of wetland impacted (pers. comm. Karey Bock, November 3, 2014). Therefore, an additional 0.38 credits would be required to mitigate for 1.9 acres of buffer impacts.

Table 4. LBMB Typical Credit-Debit Ratios and Proposed Ratio for Jetty A

Resource Impacted	Typical Compensation Ratios		Proposed Compensation	
	Impact Acreage	Mitigation Acre Credits	Impact Acreage	Mitigation Acre Credits
Wetland, Category I	Case-by-case	Case-by-case	--	--
Wetland, Category II	1	1.2	--	--
Wetland, Category III	1	1	0.51	0.51
Wetland, Category IV	1	0.85	--	--
Critical Areas Buffer[1]	Case-by-case	Case-by-case	1.90	0.38

[1]Critical areas buffers mitigated at 20% of the ratio for each category of wetland impacted.

10.0 CREDIT PURCHASE OR TRANSFER TIMING

The USACE will be initiating internal processes to purchase the credits upon Ecology's approval of this Bank Use Plan for purposes of CWA Section 401 Water Quality Certification and Coastal Zone Management Act consistency. If the Jetty A project progresses per schedule, mitigation credits will be purchased in the spring or summer of 2015.

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JARPA Appendix H
Water Quality Protection and Monitoring Plan for Section 401 Individual Water Quality Certification

For
Rehabilitation of Jetty A
Near the Mouth of the Columbia River, Pacific County, Washington

Submitted by the U.S. Army Corps of Engineers, Portland District, Civil Works

April 2015

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US Army Corps of Engineers ®
Portland District

Water Quality Protection and Monitoring Plan for Section 401 Individual Water Quality Certification

Mouth of the Columbia River
Jetty A Rehabilitation

April 2015

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1.0 INTRODUCTION

This document provides background information on the mouth of the Columbia River (MCR) Jetty A Rehabilitation Project, and describes the Water Quality Protection and Monitoring Plan (WQPMP) that will be implemented during project construction. The objective of the WQPMP is to minimize impacts on water quality during work performed over water or below the jurisdictional ordinary high water mark (OHWM), in compliance with Section 401 of the Clean Water Act (CWA). Work performed above the OHWM will be regulated by the project's National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP), which will be secured from the Environmental Protection Agency (EPA) through a permit request via the online electronic Notice of Intent system to use their CWA Section 402 CGP.

Sections 2, 3, and 4 of this WQPMP include water quality protection measures; monitoring parameters, methods, and evaluation criteria; and contingency responses in the event a water quality criterion is exceeded during construction activities.

1.1 PROJECT BACKGROUND

The Columbia River drains approximately 259,000 square miles and flows 1,243 miles from its headwaters in the Canadian Rockies of British Columbia, across the state of Washington, and along the border of Washington and Oregon to its mouth on the Pacific Ocean near Astoria, Oregon. The portion of the river referred to as the "lower Columbia River" extends from Bonneville Dam (River Mile [RM] 146) to the river mouth (Figure 1).

The combination of large waves from the Pacific Ocean and strong river currents historically resulted in shifting sandbars at the MCR, making navigation through it extremely treacherous. Between 1885 and 1917, the U.S. Army Corps of Engineers (USACE) constructed the North and South Jetties to realign the ocean entrance to the Columbia River, dramatically improving navigation through the MCR. Jetty A and the Sand Island pile dikes, constructed from 1930 to 1942, produced the present entrance configuration (Figure 1). All the jetties have experienced considerable deterioration since construction, mainly due to extreme wave attack and foundation instability associated with erosion of the tidal shoals on which the jetties were built.

Figure 1. Location of the MCR Jetty System.

The Jetty A Rehabilitation Project site is located on the north bank of the Columbia River east of Cape Disappointment State Park, near the City of Ilwaco, Washington (Figure 2). The Jetty A Rehabilitation project is part of a larger repair and rehabilitation strategy for addressing issues at all three jetties. The proposed rehabilitation activities at Jetty A include construction access improvements, the creation of staging areas, delivery of construction materials, rehabilitation and repair of the existing jetty, and dredging and construction of a temporary barge off-loading facility.

1.2 MCR JETTY A PROJECT DESCRIPTION

1.2.1 Site Conditions

Jetty A was constructed in 1939 to direct river and tidal currents away from the downstream North Jetty. Various repairs have been performed over the years to restore the height and width of the crest. Originally 1.1 miles in length, the length of the jetty has been reduced by approximately 900 feet since its construction, and without action is expected to continue to deteriorate at a rate of 5 to 20 feet per year (USACE 2012a).

Jetty A is located near Cape Disappointment State Park, on the Long Beach Peninsula, in Pacific County, Washington. The jetty is on USACE-owned property that is leased to the U.S. Coast Guard (USCG) for operations of its facility. The rubble-mound structure, constructed on an existing tidal shoal, has a crest elevation ranging from 20 to 24 feet North American Vertical Datum of 1988 (NAVD88) and a crest width ranging from 10 to

40 feet. It extends approximately 1 mile south into the mouth of the Columbia River and, along with the North and South Jetties, helps to stabilize the navigational channel, reduce the need for dredging, and provide protection for vessels (USACE 2012a).

Figure 2. Jetty A Location.

Summary tidal information for the project site is provided below based on data from the National Oceanic and Atmospheric Administration's (NOAA) National Ocean Service for the MCR North Jetty tidal gage station (Station 9440574), near Cape Disappointment, Washington. This tidal station captures water levels characteristic of the open coast conditions of the MCR. For this project, relevant elevations are listed below (AECOM 2015a):

MEAN LOWER LOW WATER, MLLW = -0.25 ft NAVD 88
MEAN HIGHER HIGH WATER, MHHW = 7.5 ft NAVD 88
MEAN HIGH WATER, MHW = 6.9 ft NAVD 88
MEAN TIDE LEVEL, MTL = 3.9 ft NAVD 88
MEAN SEA LEVEL, MSL = 3.8 ft NAVD 88
MEAN LOW WATER, MLW = 1.0 ft NAVD 88

The Mean Higher High Tide (MHHT) elevation is used to determine the lateral extent of navigable waters under the CWA. During a December 2014 site visit, the USACE determined the MHHT boundary using field indicators, such as scour marks and presence of litter, debris, and driftwood. On the east (estuary) side of the jetty, an elevation of 11.2 feet NAVD88 is used to define the river's jurisdictional boundary. On the west (ocean) side, increased wave heights result in a higher jurisdictional boundary; the MHHT line corresponds to the 14.0-foot elevation contour (AECOM 2015a).

Aquatic habitat in the vicinity of Jetty A consists primarily of shallow-water habitat (defined for this project as water that is between 0 and 20 feet to 23 feet below MLLW[1] [AECOM 2015a]). There is little habitat heterogeneity because of the dynamic current, wind, and wave conditions. The area is mostly comprised of relic large jetty armor stone and shifting sand foundation. There is an existing relic pile dike in the vicinity. Large volumes of driftwood that accumulate on the jetty are transitory within the jetty area. Little terrestrial vegetation grows on the jetty (AECOM 2015a).

Six wetlands were delineated on Jetty A during a site visit in December 2014. Five of the wetlands are non-tidal wetlands formed on top of historical fill in the upper terrace and receive water exclusively by precipitation and runoff from higher upland areas. The sixth wetland is located at a hairpin turn near the USCG administration buildings and continues along the shoreline of Baker Bay to the northwest (USACE 2015). Table 1 below summarizes the wetlands within the project area.

Table 1. Jetty A Wetland Summary

Wetland ID	Wetland Area (acre)	Buffer Width (feet)	Type
JA1	0.34	50	Non-Tidal
JA1N	0.03	50	Non-Tidal
JA2	0.12	50	Non-Tidal
JA4	0.01	50	Non-Tidal
JA5	0.01	50	Non-Tidal
JA6	0.04 (in study area)	100	Estuarine Inter-Tidal Emergent, persistent

Source: USACE 2015

[1] MLLW is 0.25 feet below zero feet NAVD88 at the North Jetty Tidal Station No. 9440574. To convert MLLW elevations to NAVD88, add 0.25 feet.

1.2.2 Jetty A Construction Activities

1.2.2.1 Laydown/Stockpile Area

Approximately 7.6 acres located near the root of the jetty have been identified as suitable for offloading, staging, and stockpiling of construction related equipment and material. This area is generally located north of STA 46+00 and south of the Coast Guard facilities. This is an old shooting range and dumping ground in the vicinity that the Corps will avoid during staging. The Corps will also avoid the existing working Coast Guard helipad and provide an appropriate buffer. A horizontal clearance of 100 feet is required based on coordination with USCG personnel. A minimum of a 20-foot buffer will be in place around the constructed staging/stockpiling area, except for land-based refueling areas, which will have a buffer of about 150 feet. The stockpile area will require some grading for stockpile and staging purposes, and clearing and grubbing of existing vegetation. A layer of gravel is required after clearing and grubbing to provide a suitable surface for construction equipment and stockpiling (Moffat & Nichol 2014). Figure 3 at the end of Chapter 1 shows the draft plan view of the material laydown/stockpile area. This area will be restored and re-vegetated upon project completion.

1.2.2.2 Construction Access and Material Offloading

Access improvements are required for construction equipment and materials to be delivered to the site. Access improvements would allow for delivery by barge, by truck, or both.

Land Based Construction Access

For truck access, a construction access pathway will be constructed both on the top of the jetty and along the eastern, leeward side of the existing jetty between the stockpile area located near the jetty (STA 46+00) and the jetty head (STA 89+00) (Figure 4). Existing debris, primarily driftwood, will be relocated to low points in the existing pathway area to act as fill. Rock infill will be placed to fill large voids between the placed driftwood and topping gravel added to provide a suitable surface for construction equipment. A minimum 2:1 gravel rock overlay to driftwood volumetric ratio is required to prevent the driftwood from floating. No more than two vehicle turnouts will be placed along the pathway. Each turnout will be approximately 20 feet wide by 90 feet long.

Material Offloading Facility

For barge access, a material offloading facility (MOF) will be constructed in addition to construction of the access pathway. The MOF will be located between approximately Station 77+00 and 86+00, avoiding the pile dike structure (~STA 83+00 to 83+50). The deck or working surface elevation for the structure may be about +19.4 feet NAVD88 to keep the construction equipment out of the water during high tide and mild storm events. The MOF will include temporary piles and

dredging to a bottom finish depth of -25 ft MLLW, including over-dredge disturbance to -32 ft MLLW. Construction access for the MOF may require a maximum of approximately 60,000 cubic yards (cy) of dredge volume be removed from a maximum area of approximately 1.7 acres (74,052 square feet) and could include an additional maximum 29,640 CY (7,778 CY below MLLW) of fill placed to construct and stabilize the MOF. The maximum footprint of the fill for the MOF will be no more than 1.2 acres.

Maintenance dredging may be required for one additional year, depending on the length of the construction project. The MOF would be removed within 2 years of the time of construction.

Barge Access and Delivery Route

Barge access may rely on berthing a floating crane near station 84+00 to off-load rock transported by barge onto the temporary staging area. The crest of the jetty construction access road between Station 77+00 and 86+00 will be filled with smaller gradation of armor stone to create an approximately 70-foot-wide temporary stockpile/staging area. This temporary stockpile/staging area will be used to stockpile rock from the barge and allow ample space for off-road trucks to maneuver (Figure 5, Figure 6). An excavator, or similar equipment, will load material from the stockpile onto off-road trucks that are staged in this area. The off-road vehicles will travel to the barge location via the construction access pathway and turn around within the widened portion of the pathway. The widened portion of the pathway is around elevation +19.4 feet (NAVD88) but will likely be constructed at the final design crest elevation.

The likely scenario is that a crane barge will berth against three dolphins and the material barge will berth against the crane barge. The berthing dolphins may be comprised of one plumb and two battered steel H or pipe piles. The platform and berthing dolphins would be equipped with a fendering system comprised of fenders and fender panels. It is anticipated that the crane will be used to unload rock from the barge. This concept assumes a floating crane/barge of sufficient length and lifting capacity to unload materials without having to move or reposition the barge. The contractor may propose an alternative barge offloading scenario, but will be provided with constraints related to: the maximum allowable size of the dredge and fill footprints; the maximum allowable volume of dredged material; the maximum allowable depth of dredging; the maximum number and types of piles used (no treated wood, 24-inch maximum diameter); and the requirement to use a vibratory hammer for pile installation.

The toe of the rock fill will likely be stabilized by re-working the relic stone to key into the jetty slope at some pre-determined elevation (currently assumed to be 0.0 feet NAVD88) by the contractor. The slope will then be built up using new stone that will eventually be used in the jetty repair and temporarily filled with crushed rock to

create an even driving surface for the off-road equipment. The footprint fill area for barge access/delivery route below jurisdictional OHW will be no greater than 1.3 acres and fill volume will not exceed 38,888 CY.

1.2.2.3 Jetty Repairs

The design template for scheduled Jetty A trunk repairs includes a 30-foot crest width, +24-foot MLLW crest elevation, a 1V:1.5 - 2H ocean-side slope, and 1V:1.5H river channel side slope from approximately Station 46+00 to approximately station 87+00. The design template for the jetty head stabilization (~STA 87-89+00) will feature a 40-foot-wide crest at approximately elevation +20-ft MLLW with a side-slope of approximately 1V:2H. Total head and trunk repairs for Jetty A will extend from approximately Stations 46+00 to 89+00 and will lie within the existing jetty footprint based on the configuration of the original cross section, previous repair cross sections, and redistribution of jetty rock by wave action.

Spatially variable damage along the exposed length of the jetty will be repaired using up to 82,000 tons of armor stone. Repairs will be made to the upper area of the jetty cross-section using armor stone having a size range of 7 to 28 tons, each. Median armor stone size will be approximately 18 tons, and repairs will be made using land-based equipment for armor stone placement. Reworked relic stone could account for about 12,560 tons. Most of the work will occur above MLLW using land-based equipment (a crane or large track-hoe excavator on top of the jetty) and limited water-based equipment. The crane or excavator will use the access pathway to move along the jetty. Rock will be supplied to the land-based placement operation by land and/or marine-based rock delivery.

1.2.2.4 Navigational Structure Repair

An existing US Coast Guard (USCG) navigational tower structure, located at Station 78+00 could be left in place, removed, or replaced. If replaced, the replacement tower will include construction of a concrete base of about 6 feet by 6 feet by 4 feet (deep). The USCG will provide the tower with a platform, a ladder, a prefabricated re-bar basket with the anchor bolts set in it for the tower base, and a prefabricated wood concrete form with pins for the rock. The concrete foundation will be poured on-site into a pre-fabricated wood concrete form and pre-fabricated re-bar basket. Rebar will be drilled into the rocks for structural stability. If the existing USCG navigational tower structure at Station 78+00 is to be replaced, first the existing base in need of replacement will removed and the armor stone exposed. Then, anchors will be drilled, the bottom graded with finer stone so that any concrete will not seep through cracks in the jetty stone, and a frame used to contain the new concrete base. An existing range marker, located at about Station 86+50, will remain in place and be avoided during jetty repair efforts.

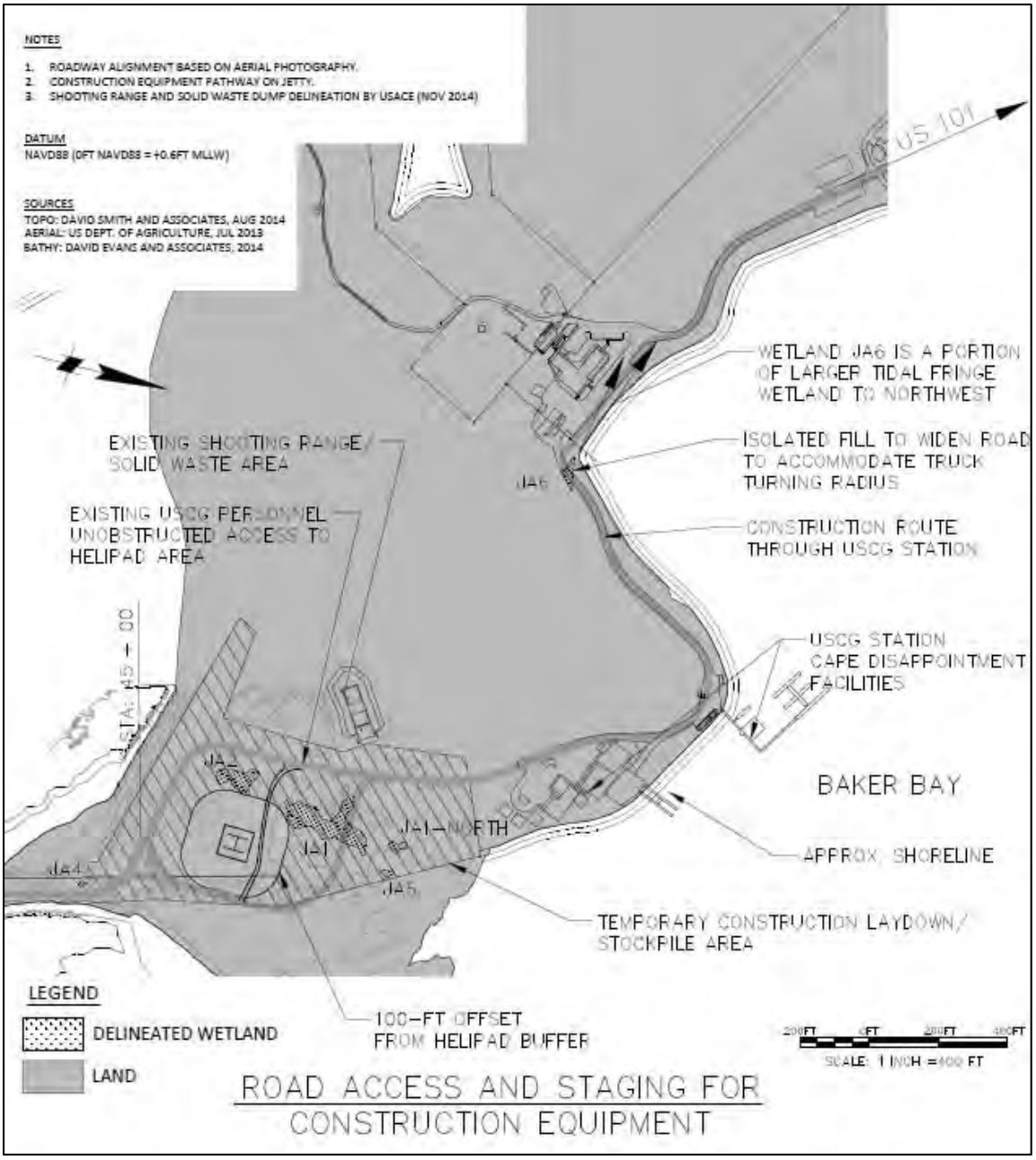

Figure 3. Jetty A Access and Staging Area Draft Plan

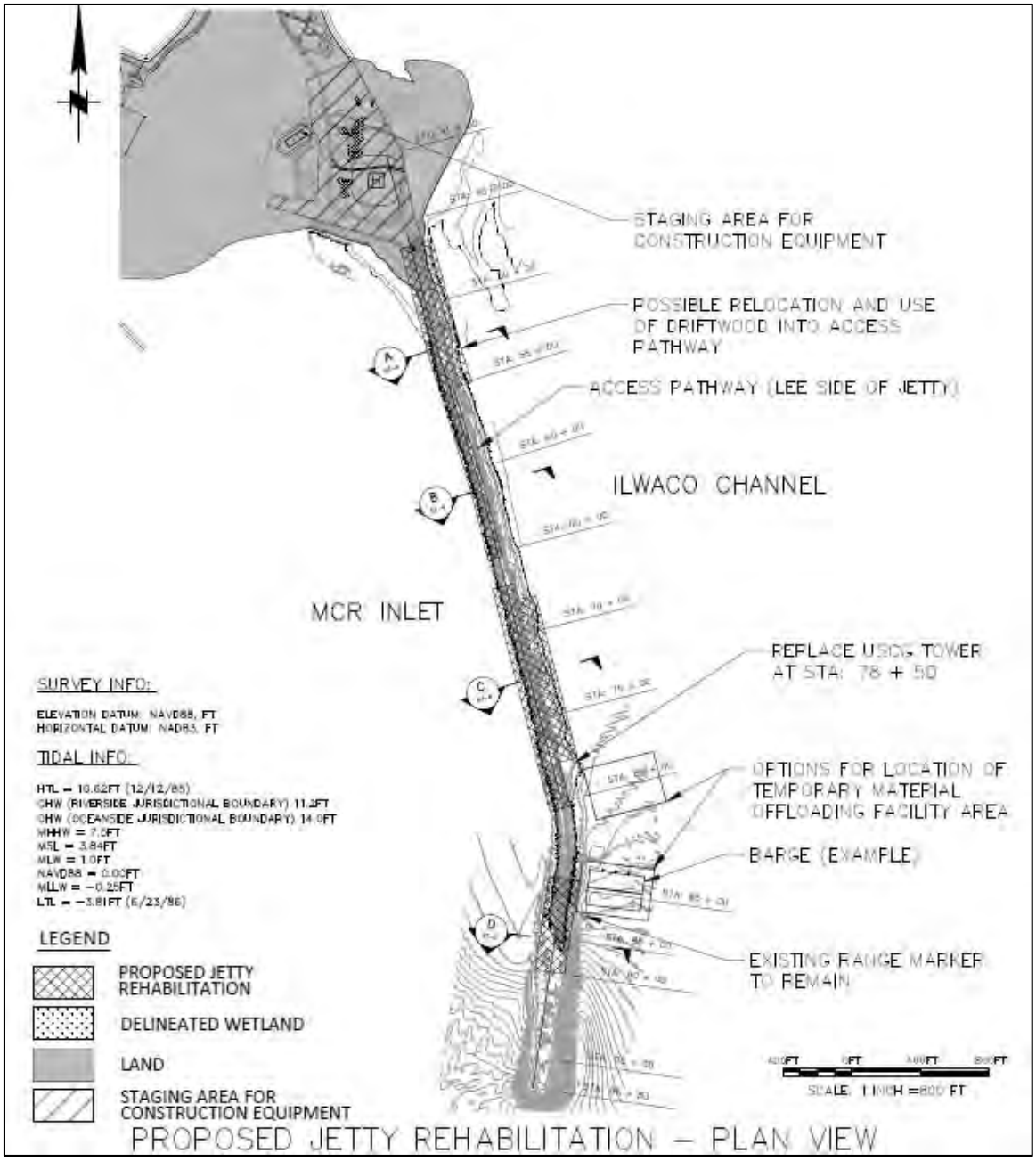

Figure 4. Jetty A Repair & Access Road Concept Plan - Overview

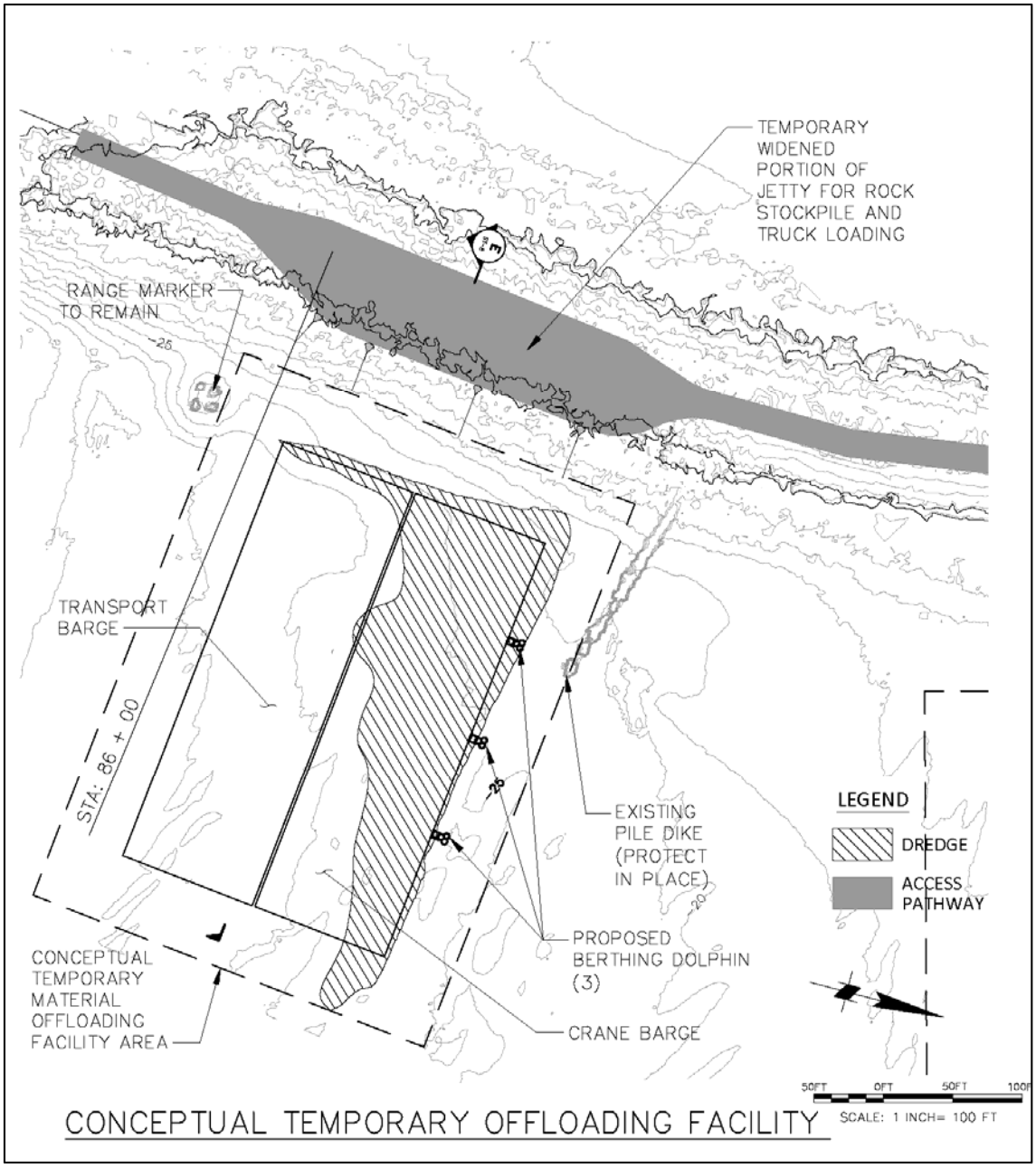

Figure 5. Jetty A Material Offloading Facility Concept Plan

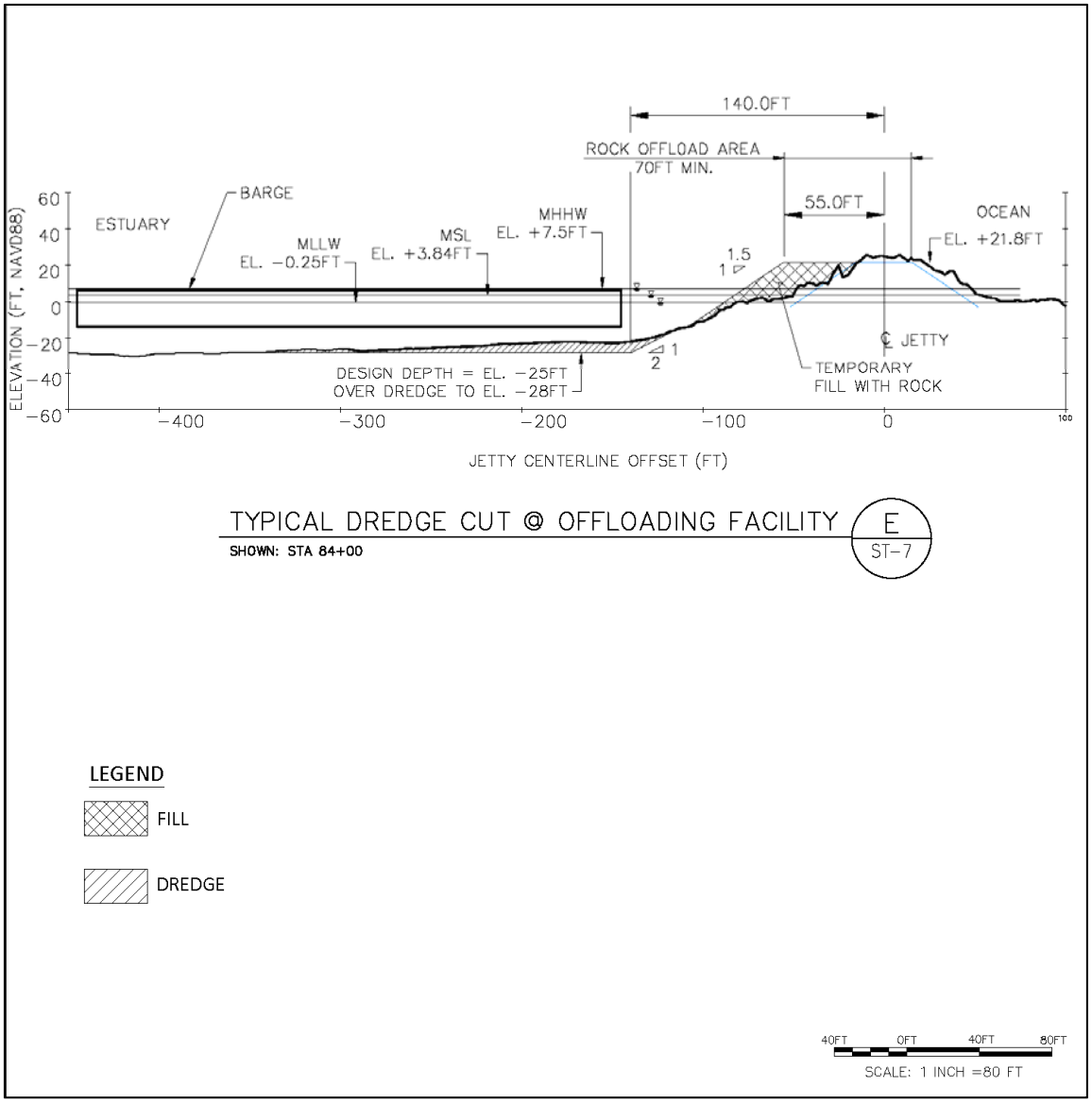

Figure 6. Jetty A Material Offloading Facility Concept Cross-Section

1.2.3 Work in/near Wetlands and Waters

Rehabilitation activities at Jetty A would result in approximately 0.54 acre of unavoidable permanent wetland impacts. Wetlands JA1, JA1N, JA2, JA4, and JA5, and their buffers, would be permanently filled as a result of construction staging, storage, and rock stockpiles. Approximately 0.04 acre of wetland JA6 would be temporarily filled by roadway improvements. When possible, removable mats will be used to reduce temporary wetland fill impacts. Following construction, imported road fill would be removed from the estuarine wetland site and all temporary impacts would be restored to pre-construction condition (AECOM 2015b). Figure 3 shows impacts to wetlands from construction of the laydown/stockpile area and access road.

Most of the jetty repair work is expected to occur above -5 ft MLLW, however, there may be isolated work areas near the seaward end that extend to -10 ft MLLW. Repairs are intended to address damage along the upper part of the jetty, from -5 feet NAVD 88 to the jetty crest (23.4 ft NAVD 88) along STA 46+00 to 87+00 and -10 ft NAVD 88 to 19.4 ft NAVD 88 (jetty crest) along STA 87-89. Along most of the area, the toe of the template is not expected to extend below 0 ft NAVD 88. Placement of stone below 0 ft NAVD is expected to be limited to isolated locations and shall occur only to transition the repair template to the existing structure surface. Approximately 15,000 cy of driftwood, which has accumulated along the trunk of the jetty, will be either incorporated into elements of site restoration or mitigation designs (incorporated into the causeway), or partially removed as part of the project. During construction, it is possible that barrels or waste that could be hazardous or toxic could be uncovered, or float onto the Jetty during construction. If this occurs, material will be handled in compliance with the Corp's Hazardous and Toxic Wastes specifications and will be reported to the Coast Guard National Response Center (1-800-424-8802).

Volumes of cut material required for pathway construction assumes only driftwood material will be removed from the site as required while reworking of the relic jetty stone will remain. There would be 7,778 CY of total fill volume below the MLLW, which represents less than 10% of the total fill for the project. Proposed in-water work, including quantities of cut and fill, are summarized in Table 2. A cross section of the proposed Jetty A and associated construction access road is shown in Figure 7.

Table 2. In-Water Work Project Activities.

Activity	Duration (Temporary or Permanent)	Amount of material (cy) to be placed in or removed from waterbody	Area (acres) of waterbody directly affected
Construction Access Pathway (Cut)	Permanent	Up to 15,000	Approx. 2.6 acres on top of jetty
Construction Access Pathway (Fill)	Permanent	Up to 38,888	1.3 below OHW (riverside)
Jetty (armor stone) Head and Trunk (Fill)	Permanent	Up to 46,200	Approx. 2.96 crest acres
MOF Construction (Fill)	Permanent	Up to 29,640 total (Up to 7,778 below MLLW)	1.2
Jetty Repair (driftwood) (Fill)	Permanent	Max. practicable maintaining stable access causeway	Maximum practicable, estimated ~ 0.76 acres
MOF Dredging	Permanent	Up to 60,000	1.7
Piling	Temporary	Install (vibratory) up to 3 dolphins for MOF (up to 24 steel pipe piles, up to 24-inch diam. each) Install (vibratory) up to 93 Z or H pile sections for MOF	
Maintenance Dredging for MOF Basin (within 1 year after construction)	Temporary	Up to 10,500	1.7

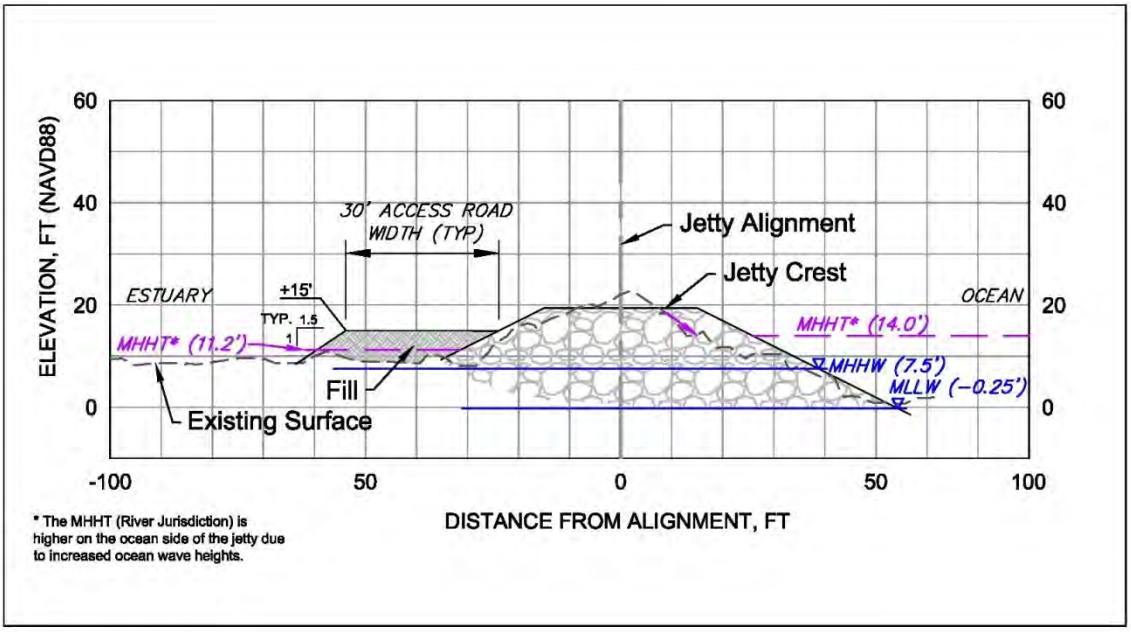

Figure 7. Construction Footprint Profile

A maximum 1.7-acre dredge basin with a finish depth of -25 feet MLLW (-32 ft MLLW maximum with disturbance and advanced maintenance) may be required to accommodate both barges (material and crane). This may include up to 60,000 cy of dredge volume removed. An additional approximately 1.2 acres and 29,640 cy of fill would be required to construct the offloading area. Maintenance dredging may be needed before offloading during each year of construction. Dredging is likely to occur on a nearly annual basis for the duration of the project construction period (USACE 2012b). A clamshell dredge would likely be used for all dredging, though there is a small chance that a pipeline dredge could be feasible but is unlikely to be used. The material to be dredged is medium to fine-grained sand.

Disposal of dredged material will occur at existing approved in-water sites. Two dredged material disposal sites, the Shallow Water Site and the North Jetty site, were considered for disposal of dredged material. Modeling has showed that the potential changes to the two disposal sites from the proposed action would not inhibit their use as disposal sites. These sites have been previously vetted through the appropriate regulatory agencies, were evaluated for their effects, and were subsequently designated or approved after such review. However, given equipment and condition constraints at the project site, it is now more likely that disposal will occur either in the flowlane or in the Environmental Protection Agency designated Deep Water Site southwest of the mouth. The flow lane disposal is most likely, as disposal at the Deep Water Site is very dangerous in the winter season. The current proposed action and use of these disposals sites will maintain compliance with approved use (USACE 2012b).

Placement of rock by heavy equipment, jetty access road construction, dredging, disposal, and pile installation and removal could all cause temporary and local increases

in suspended sediment. These increases are expected to have minimal and limited effects on the environment; suspended sediment is expected to stay within acceptable levels for fish and wildlife species of concern. Previous tests have confirmed that material to be dredged will be primarily sand with little or no fines, which does not stay suspended in the water column for a significant length of time (USACE 2012b). Increases in turbidity from construction activities on the Jetty will likely occur on a nearly daily basis but will be of limited extent and duration, as rock placement will involve clean fill. Wave and current conditions in the action area naturally contribute to higher background turbidity levels; such conditions also preclude the effective use of isolating measures to minimize turbidity. Additionally, the Portland Sediment Evaluation Team (PSET) determined that project sediments are unlikely to contain contaminants above marine benthic toxicity screening levels, and determined that sediment chemical testing of sediments is not required.

Turbidity levels and durations will be limited to conditions required in the State Water Quality Certification that include exceedance windows that are protective of beneficial uses such as by salmonids and other aquatic life. Section 2.2 provides water quality protection measures for minimizing increases in turbidity.

Replacement of the navigational structure near the head of the jetty will involve pouring concrete. While all concrete pouring will occur above the MHHW, it can still pose a risk to water quality and elevated pH levels. To replace the navigational structure, USACE will expose the armor stone, drill the anchors, and then grade the bottom with finer rock so the concrete would not seep through the armor stone cracks and into the ocean. Additionally, the concrete will be covered while it is curing to avoid contact with rainwater during storm events.

1.2.4 Construction Schedule and Timing

Construction activities for the Jetty A Rehabilitation Project likely will occur over two seasons in 2015 and 2016. Rock procurement would occur in 2015 and initial placement of rock could also occur. However, the majority of construction activities would occur in 2016. The MOF would be removed within 2 years of the time of construction.

1.2.5 Sources and Transportation of Rock and Other Fill Material

Currently, rock and gravel sources have not been confirmed. However, one or more of the quarry options presented in Table 3 would be used. Stone may be trucked or barged from the quarry. From Cape Disappointment State Park, trucks will travel along Coast Guard Road to the staging/stockpile area.

The USACE intends to use operating quarries rather than opening any new quarries. The contractor and quarry owner/operator will be responsible for ensuring that quarries

selected for use are appropriately permitted and in compliance with all state and federal laws.

Table 3. Rock Quarries Identified as Potential Sources of Material for Critical Repairs.

Quarry[1]	County, State	Nearest City	Road Miles from MCR	Unit Weight (pcf)
Beaver Lake Quarry	Skagit, WA	Clear Lake, WA	251	181.1
Marble Mount Quarry	Skagit, WA	Concrete, WA	276	189.7
Columbia Granite Quarry	Thurston, WA	Vail, WA	129	168.5
Tower Rock (Phipps) Quarry	Cowlitz, WA	Castle Rock, WA	75	167.4
Fisher Quarry	Clark, WA	Camas, WA	116	168.5
192nd Street Quarry	Clark, WA	Camas, WA	117	168.5
Mountain Top (Yacolt) Quarry	Clark, WA	Yacolt, WA	115	166.2
Old Maid's Canyon Quarry	Jefferson, OR	Madras, OR	220	168/175
Youngs River Falls Quarry	Clatsop, OR	Astoria, OR	30	181.8

pcf = pounds per cubic foot

[1]List may not be all-inclusive

1.2.6 Construction Staging, Storage, and Rock Stock Piles

As described in Section 1.2.2.1, an area for construction staging, laydown, and stockpiling will be located near the root of Jetty A, north of STA 46+00 and south of the USCG facilities. If necessary during construction, stockpiles may be covered when materials are not being moved. However, this is not anticipated since a majority of the stone that would be stockpiled on-site would be extremely large armor stone. Covering other materials that may be stockpiled for the haul road may prevent erosion and increased turbidity caused by runoff from stockpiled materials. Construction of the staging areas would result in permanent fill of five wetlands and temporary fill of another wetland as discussed previously. Staging and stockpiles will remain above 11.2 ft NAVD 88.

1.3 RELEVANT WATER QUALITY CRITERIA

The designated beneficial uses for coastal waters of the Pacific Ocean, from Ilwaco to Cape Flattery, inclusive of the Project Site (near RM 0 of the Columbia River) include extraordinary aquatic life uses, shellfish harvest, primary contact recreation; and other miscellaneous uses, such as wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics (WAC 173-201A-612).

Water quality concerns include turbidity from earthwork, rock placement, and dredging activities, potential spills associated with green concrete work from construction of the navigation structure near the Jetty head, and potential hazardous waste removal of washed-up materials. There are relevant water quality criteria for this area of coastal waters for turbidity and pH, as described below.

Table 4 presents the water quality standards for turbidity (WAC 173-201A-210[1][e]) for this area of coastal waters. The water quality standards for turbidity are applicable to all construction activities performed below the OHWM.

Table 4. Water Quality Parameters of Concern in the Project Area.

Monitoring Parameter	**Water Quality Criterion**	
Turbidity	If less than 50 NTU:	Background Turbidity plus 5 NTU
	If greater than 50 NTU:	Background Turbidity plus 10 percent

NTU = Nephelometric Turbidity Unit

Per WAC 173-201A-210[1][e], a temporary area of mixing is allowed during and immediately after necessary in-water construction activities that result in the disturbance of in-place sediments. For the Jetty A Rehabilitation project, this would likely apply to dredging and disposal and pile installation and removal activities.

All necessary local and state permits and approvals must be obtained and best management practices (BMPs) implemented to avoid/minimize disturbance of in-place sediments and turbidity criteria exceedances before temporary mixing zones are allowed. Before mixing zones are granted, supporting information must be supplied that demonstrates that "the mixing zone would not have a reasonable potential to cause a loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses of the water body, result in damage to the ecosystem, or adversely affect public health as determined by the department" (WAC 173-201A-400 [4]).

The size of the mixing zone and the concentrations of pollutants present shall be minimized (WAC 173-201A-400 [6]). For estuaries or marine waters, the point of compliance for a temporary area of mixing extends at a 150-foot radius from the activity causing the turbidity exceedance.

The general in-water work window (IWWW) for the protection of fish in the Columbia River is November 1 through February 28. Jetty A rehabilitation activities may occur both in and outside this time frame. It is anticipated that much of the in-water work would be completed outside the established in-water work period due to the dangerous sea conditions and unacceptable safety risk of working on the jetty that would occur during the IWWW.

In addition to the criteria in Table 4, the project must also comply with narrative water quality standards, including the following:

- No visible petroleum sheen on water observed at the construction site.

- No distressed or dying fish observed at the construction site and attributed to site activities.

These narrative criteria must be met at the project location with no dilution.

The water quality standards for pH for this area of coastal waters indicate an allowable pH range within 7.0 to 8.5 with a human-caused variation of less than 0.2 units (WAC 173-201A-210[1][f]). As mentioned previously, concrete work associated with the navigation structure at the jetty head has the possibility to affect pH levels. Possible scenarios include rainwater coming into contact green cement during storm events or proper containment and housekeeping measures not upheld during construction activities. However due to the BMPs that would be applied to prevent contact of stormwater runoff with the green cement (Section 2.3), no measurable impacts to pH levels are anticipated.

1.4 EXISTING WATER QUALITY

Oregon and Washington have classified the lower Columbia River as water quality-limited and placed it on the CWA Section 303(d) list for the following parameters: RM 0 to 35.2 for temperature and polychlorinated biphenyls (PCBs); RM 35.2 to 98 for arsenic, dichlorodiphenyl trichloroethane (DDT), PCBs, and temperature; and RM 98 to 142 for temperature, arsenic, DDT, PCBs, and polynuclear aromatic hydrocarbons (PAHs). In Washington, the river also is on the Section 303(d) list for dichloro-diphenyl-dichloroethane, Alpha BHC (a pesticide), mercury, dissolved gas, dieldrin, chlordane, aldrin, dichloro-diphenyl-dichloroethylene, fecal coliforms, and sediment bioassay. In addition, the entire river is subject to a US Environmental Protection Agency (EPA) total maximum daily load (TMDL) for dioxin.

The MCR is not 303(d) listed for turbidity or pH.

2.0 WATER QUALITY PROTECTION MEASURES

2.1 TEMPORARY EROSION CONTROLS

Temporary erosion controls will be installed prior to initiation of ground-disturbing activities on-site. USACE will seek use of the EPA's NPDES Construction General Permit (CGP) for Stormwater Discharge from Construction Activities. As part of the permit, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared that will outline all facilities, BMPs, and measures for erosion prevention, sediment control, and pollution prevention. The Corps' contractor will be required to have Certified Erosion and Sediment Control Lead implement the SWPPP which will include elements for erosion and sediment control, such as the following:

- Construction discharge water generated on-site (debris, sediment, and other pollutants) will be treated using the best available technology.

- Water quality treatments will be designed, installed, and maintained in accordance with manufacturers' recommendations and localized conditions.

- Silt fences, fiber rolls, or straw bales, cofferdams, and graveled access points will be used to control sedimentation and construction discharge water.

- Construction waste material used or stored on-site will be confined, removed, and disposed properly.

2.2 TURBIDITY MINIMIZATION MEASURES

The placement of the temporary dolphins, offloading facilities, and dredging could cause short-term increases in turbidity. Dredged material would be placed in the flow lane or at the Deepwater Ocean Dredged Material Disposal Site (ODMDS) that has been previously evaluated and approved by the EPA. The ODMDS has a Site Management and Monitoring Plan that is aimed at assuring that disposal activities will not unreasonably degrade or endanger the marine environment. Site management activities include regulating the time, quantity, and physical/chemical characteristics of dredged material that is placed in the site; establishing disposal controls; and monitoring the site environs to verify that unanticipated or significant adverse effects are not occurring from past or continued use of the site and that permit terms are met. The relative quantities, characteristics, and effects of the proposed action would not be expected to have different or significant negative impacts to these sites (USACE 2012b).

The following overall impact minimization practices and BMPs will be used for all maintenance dredging for offloading facilities.

1. If a pipeline dredge is used (which is extremely unlikely), then to reduce the potential for entrainment of juvenile salmon or green sturgeon, the cutterheads will remain on the bottom to the greatest extent possible and only be raised 3 feet off the bottom when necessary for dredge operations.

2. To reduce turbidity, if a clamshell bucket is used, all digging passes shall be completed without any material, once in the bucket, being returned to the wetted area. No dumping of partial or half-full buckets of material back into the project area will be allowed. No dredging of holes or sumps below minimum depth and subsequent redistribution of sediment by dredging, dragging, or other means will be allowed. All turbidity monitoring will comply with State 401 Water Quality Certification Conditions.

3. If the Captain or crew operating the dredges observes any kind of sheen or other indication of contaminants or distressed or dying fish, he/she will immediately stop dredging and notify USACE environmental staff to determine appropriate action and will follow all appropriate agency contact protocols.

4. The Corps recently received a no-test determination from the Regional Sediment Evaluation Team. However, if routine or other sediment sampling determines that dredged material is not acceptable for unconfined, in-water placement, then a suitable alternative disposal plan will be developed in cooperation with the National Marine Fisheries Service (NMFS), EPA, Washington Department of Ecology (Ecology), and other agencies.

2.3 CONCRETE WORK

As mentioned above, concrete work associated with the navigation structure at the jetty head has the possibility to affect pH levels. As mentioned in Section 1.2.3, prior to pouring the concrete, the base will be graded with fine aggregate to prevent concrete from seeping through the armor stone cracks and into the ocean. The immediate construction area on top of the jetty required for pouring the concrete pad supporting the navigation structure will be adequately isolated, and wash and cure water will be appropriately contained and treated offsite prior to discharge. Concrete will be cured for a minimum of 24-hours prior to contact with any water. These construction practices will avoid and minimize the potential for wet concrete to contact ocean water or stormwater entering the ocean, thereby minimizing water quality risks associated with concrete work.

2.4 EMERGENCY RESPONSE

To avoid the need for emergency response, a USACE Government Quality Assurance Representative will be on-site or available by phone at all times throughout construction. Emergency erosion/pollution control equipment and BMPs will be on-site at all times. The USACE Project Engineer or their designee will conduct regular inspections and ensure that a supply of sediment control materials (e.g., silt fence, fiber rolls, or straw bales), hazardous material containment booms, and spill containment booms are available and accessible to facilitate the cleanup of any hazardous material spills. An emergency response plan will be on-site at all time.

Regular site inspections will occur in compliance with the NPDES CGP permit either 1) at least once every 7 calendar days; or 2) once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches or greater.

Ecology and EPA will be notified at the following addresses when the discharge of turbidity exceeds the water quality standards.

Washington Department of Ecology
Lori Kingsbury, Federal Permit Manager
Ecology Southwest Regional Office
(360) 407-6926
loch461@ecy.wa.gov

USEPA – Region 10
NPDES Compliance Unit – Attn: Federal Facilities Compliance Officer
1200 6th Ave, Suite 900
OCE-133
Seattle, WA 98101
(206) 553-1846

Pacific County Emergency Management will be notified at the following address in the case of any emergencies.

Pacific County Emergency Management Agency
300 Memorial Drive
P.O. Box 101
South Bend, WA 98586-0101
(360) 875-9397

In case of hazardous material or oil spills, the National Response Center, the Washington Military Department's Emergency Management Division (EMD), Ecology, USCG, and the Oregon Department of Environmental Quality (DEQ) will be notified.

- USCG National Response Center, (800) 424-8802
- USCG, Sector Columbia River, (503) 861-2242
- Washington Military Department's EMD, (800) 258-8990
- Ecology, Southwest Region Office, (360) 407-6300
- Oregon DEQ, Portland, 503-229-5263

2.5 HAZARDOUS MATERIALS

A description of any regulated or hazardous products or materials to be used for the project, including procedures for inventory, storage, handling and monitoring, will be kept on-site. Hazardous waste will be separated from construction and domestic waste. Waste will be stored in sealed containers suitable to prevent leakage and corrosion, and labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements. All containers stored outside will be stored within appropriately sized secondary containment to prevent spills from being discharged, or by similarly effective

means designed to prevent the discharge of pollutants from the area. Hazardous materials will be disposed of in accordance with the manufacturer's recommended method of disposal and in compliance with federal, state, and local requirements. Spills will be cleaned up immediately using dry clean-up methods where possible and used materials will be disposed of properly.

Fuels or toxic materials associated with equipment will not be stored or transferred near the water. Fueling and maintenance of equipment should occur offsite. If on-site fueling or maintenance is required, equipment will be fueled and lubricated only in designated refueling areas at least 150 feet from the OHWM and wetland areas. Fueling on the jetty itself for cranes and other stationary equipment will occur via a Wiggins Fast-Fuel system, or equivalent, per the Biological Opinion from NMFS. Secondary containment will also be implemented during fueling of the stationary equipment, and additional spill response materials will be available in the immediate vicinity of the stationary refueling actions. Portable facilities for sanitary waste will be located within the project staging area. The Corps is also requiring the use of Environmentally Acceptable Lubricants (EALs) [2] for equipment on the jetty or working below the OHWM.

Any barrels or waste of questionable hazardous or toxic nature that are uncovered or float onto the jetty during construction will comply with the Corps' Hazardous and Toxic Wastes specifications and also will be reported to the Coast Guard National Response Center at 1-800-424-8802.

2.6 SPILL CONTAINMENT AND CONTROL

A description of spill containment and control procedures and associated spill clean-up supplies and equipment will be on-site, including: notification to proper authorities, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures stored on the site including a supply of sediment control materials, proposed methods for disposal of spilled materials, and employee training for spill containment. Generators, cranes, and any other stationary power equipment operated within 150 feet of OHWM or wetland areas will be maintained as necessary to prevent leaks and spills from entering the water. Vehicles/equipment will be inspected daily for fluid leaks and cleaned as needed before operating within 150 feet of OHWM. Any leaks discovered will be repaired before the vehicle/equipment resumes service.

[2] Environmentally Acceptable Lubricants by the U.S. EPA (2011); *e.g.*, mineral oil, polyglycol, vegetable oil, synthetic ester; Mobil® biodegradable hydraulic oils, Total® hydraulic fluid, Terresolve Technologies Ltd.® biobased biodegradable lubricants, Cougar Lubrication® 2XT Bio engine oil, Series 4300 Synthetic Bio-degradable Hydraulic Oil, 8060-2 Synthetic Bio-Degradable Grease No. 2, *etc*. The use of trade, firm, or corporation names in this Plan is for the information and convenience and does not constitute an official endorsement or approval by the U.S. Department of Defense or Portland District Corps of Engineers of any product or service to the exclusion of others that may be suitable. For additional information, see also:
http://nepis.epa.gov/EPA/html/DLwait.htm?url=/Exe/ZyPDF.cgi/P100DCJI.PDF?Dockey=P100DCJI.PDF

Equipment used over or below the OHWM will be cleaned before leaving the staging area, as often as necessary to remain grease-free. Equipment operating on the jetty or causeway, and any equipment operating over or below the OHWM will also be required to use EALs. Proper fueling and maintenance procedures will be followed as discussed above in Section 2.5.

2.7 WATER QUALITY MONITORING

In-water work will require turbidity monitoring that will be conducted in accordance with 401 Water Quality Certification Conditions to ensure the project maintains compliance with State water quality standards. Temporally, effects to water quality from suspended sediment and turbidity could occur on a daily basis, but are not expected to be continuous throughout the day. Water quality monitoring is described in more detail in Section 3.0 below.

2.8 MITIGATION AND RESTORATION

As described in Section 1.2.3, the repairs to Jetty A would result in unavoidable impacts to wetlands and waters of the United States protected under Section 404 of the CWA. The USACE would implement compensatory mitigation for those impacts. Mitigation options for impacts to wetlands and non-wetland waters were proposed in the Corps' Mitigation and Monitoring Proposal and Bank Use Plan. Three wetland mitigation options were considered: 1) the Long Beach Mitigation Bank; 2) Wetland Creation near the North Jetty; and 3) a combination of those two options. For non-wetland waters impacts, three mitigation options were considered: 1) local riparian enhancement; 2) seagrass habitat establishment; and 3) habitat complexity improvements associated with jetty design. The Corps proposed to purchase wetland mitigation bank credits and to implement a combination of sea grass establishment and habitat complexity improvements commensurate with impacts.

2.9 ADDITIONAL CONSERVATION MEASURES

In addition to standard environmental protection measures to be included in the contract specifications, the following measures will be employed during the marbled murrelet nesting season (April 1 – September 15) to reduce impacts from noise to nesting marbled murrelets:

1. Trucks will only be allowed to use the roads through Cape Disappointment State Park during daylight hours.

2. Trucks will not unnecessarily stop along the roads through Cape Disappointment State Park.

3. Trucks will be prohibited from using compression brakes (also known as jake brakes) on the roads through Cape Disappointment State Park.

Sea lions and seals are not as common on Jetty A relative to the South Jetty; Jetty A is not an identified haul out for pinnipeds. However, if seals or sea lions are observed on the structure during construction, conservation measures will be implemented to minimize disturbance. During land-based rock placement, contractor vehicles and personnel will avoid as much as possible direct approach towards pinnipeds. If it is absolutely necessary for the contractor to make movements towards pinnipeds, the contractor shall approach in a slow and steady manner to reduce the behavioral harassment to the animals as much as possible. Monitoring and reporting will occur as required.

Offloading facilities will be installed via vibratory hammer and will use steel or untreated wood piles. The Corps will implement a soft-start procedure for pile installation. The objective of a soft-start is to provide a warning and/or give animals in close proximity to pile driving a chance to leave the area prior to a vibratory driver operating at full capacity thereby, exposing fewer animals to loud underwater and airborne sounds. A soft start procedure will be used at the beginning of each day when in-water pile driving or any time pile driving has ceased for more than 30 minutes. For vibratory pile driving, the contractor will initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. The procedure shall be repeated two additional times.

The Corps also will require the contractor to take precautions to avoid and minimize spread of aquatic invasives. This includes appropriate inspection and cleaning of all construction equipment and supplies intended for use in waters that has been exposed to other lake or stream water.

3.0 WATER QUALITY MONITORING PLAN

Visual monitoring is proposed for this project. Instrumented turbidity monitoring at the site during winter and summer months is considered dangerous and will not be completed. Turbidity will be visually monitored from the top of the jetty every 4 hours during construction when placed materials may be transported to the Columbia River and estuary from the construction site. In the event that an exceedance of water quality standards is indicated by visual monitoring, contingency response actions and agency notifications will be triggered. The contingency response and notification plan is provided in Section 4. Additional 401 Water Quality Certification conditions and protocols may be identified.

Visual monitoring of construction activities will be conducted daily for turbidity plumes, floating debris, trash, oil sheen, etc.

3.1 INSTRUMENTED MONITORING

Instrumented turbidity monitoring will not be performed at this site due to safety concerns.

3.2 VISUAL MONITORING

Turbidity will be visually monitored every 4 hours during construction, with photographic documentation of each monitoring event. The mixing zone for turbidity along estuary waters is 150 feet. Turbidity will visually be sampled at the Background Station and the Compliance Station. The Background Station will be positioned approximately 500 feet up-current of the Project Site and beyond the influence of construction activities. The Compliance Station for turbidity will be 150 feet down-current from the construction activity, although tidal reversals are possible during flood tide conditions, which could shift the Compliance and Background Station locations. Monitoring at the Compliance and the Background stations will be completed on the same schedule in order to compare the Compliance Station with the Background Station during each monitoring interval.

Visual monitoring of the Columbia River will be performed from the top of the jetty. To perform visual monitoring, the observer will look for either a plume or a visible difference in turbidity between the background site and the compliance site. Visual and photographic monitoring will be documented on the data sheet provided in Appendix A. Additional 401 Water Quality Certification conditions and protocols may be identified.

Visual monitoring will be performed during any work below the OHWM, including but not limited to the following construction activities:

- Rock placement or rework
- Haul road and turn-out construction
- Pile installation and removal
- Dredging

3.2.1 Monitoring Parameters

The following parameters will be assessed during visual monitoring:

- Turbidity
- Sheen
- Distressed or dying fish
- Construction debris in the water
- Operation and effectiveness of BMPs

Visual monitoring will include photographic documentation of all monitoring events. Photos will be taken from the top of the jetty and/or the barge. All photos, along with

date, time, tide, weather, and observations, will be documented on the data sheet included in Appendix A.

3.2.2 Monitoring Schedule

The frequency of visual monitoring will be as follows:

- Every 4 hours during construction operations on the jetty or below OHWM by the Project Engineer or their designee.
- Prompt confirmation by the Project Engineer, or their designee, that appropriate steps have been taken to correct the exceedance or poor conditions noticed in visual monitoring.

3.2.3 Monitoring Locations

The Background Station will be positioned approximately 500 feet up-current of the project site and beyond the influence of construction activities. The Background Station will be located along a part of the jetty with comparable water depth and other physical characteristics (e.g., slope and substrate) to the extent possible. This station will be monitored during every event because the turbidity criterion is based on an acceptably small increase above ambient background levels in the river.

Photographic documentation of turbidity monitoring will be completed from the top of the jetty. Photos will be documented on the Exceedance Photo Documentation data sheet included in Appendix A.

To identify the Compliance Site from the viewpoint, the 150-foot radius will be marked along the jetty both up- and down-current of construction activity. The Background Station will also be marked.

The Compliance and Background monitoring stations will be used for all Jetty A Rehabilitation activities.

Visual monitoring will also be performed at the following locations during rock placement, access road and turn-out construction, dredging, and pile installation/removal:

- For BMP performance, at the location of all active operations.
- For visible sheen, just down-current of the construction in the Columbia River and the Pacific Ocean Nearshore.
- For construction-related floating debris
- For distressed or dying fish

3.3 RECORD KEEPING AND REPORTING

The Project Engineer or Construction Manager will keep a written record of monitoring activities and inspections during visual monitoring. These records will be maintained in project files and provided to Ecology in accordance with specified reporting requirements

3.3.1 Monitoring Reports

Results of water quality monitoring will be documented and submitted (e-mailed) to Ecology weekly during construction. A written summary of visual observations and photographic documentation will also be provided. The water quality monitoring reports will include the following information:

- Date and time of sample
- Sample location
- Sample results
- Name of person collecting the sample
- Weather conditions
- Photo ID number

A water quality monitoring form is included in Appendix A.

4.0 CONTINGENCY RESPONSE AND NOTIFICATION PLAN

4.1 CONTINGENCY MEASURES

In the event of an exceedance of water quality standards outside of allowable exceedance windows per the State Water Quality Certification, as observed during visual monitoring, personnel will immediately assess the source of the impact or exceedance. Once the source has been identified, personnel will implement operational modifications or other control measures to prevent further occurrences and limit additional environmental impact. Monitoring will continue to confirm the control measures are effective and the observed water quality exceedances have been mitigated. The Corps and contractor will conduct required reporting.

4.1.1 Work Below Ordinary High Water Mark

In the event a significant turbidity plume resulting from project activities is observed during visual monitoring of construction activities below the OHWM, construction operations and BMPs will be thoroughly inspected to identify the source of the turbidity exceedance, and appropriate operational controls, engineering controls, or enhanced

BMPs will be promptly implemented to reduce turbidity to acceptable levels. A turbidity plume is considered significant when it extends the entire length of the mixing zone and remains visible 150 feet from the construction activity or point of discharge.

Based on the shape and extent of the turbidity plume, it should be evident that the plume is sourced from a site construction activity rather than a background condition. If a visible turbidity plume is evident at the compliance boundary, follow-up monitoring will be initiated to better assess compliance with water quality standards and to track the effectiveness of any supplemental controls or BMPs that may be implemented.

Turbidity exceedances will be photographed and documented on the data sheet included in Appendix A. The Corps and contractor will conduct required reporting.

4.1.2 Construction Debris in Water

If construction debris is observed in water, the Contractor will promptly recover the debris and dispose of it properly.

4.1.3 Distressed or Dying Fish

In the event distressed or dying fish are observed at the construction site and are attributed to site activities, work will immediately stop and the Washington Military Department's EMD, the Washington Department of Fish and Wildlife (WDFW), NMFS, and Ecology will be contacted at the numbers listed below:

- Washington Military Department's EMD, (800) 258-5990
- Chris Conklin, WDFW, (360) 249-1228
- NMFS Office of Law Enforcement, (503) 231-6240 or (206) 526-6133
- Ecology, Southwest Regional Office, (360) 407-6926

The condition of the fish (dead, dying, or erratic behavior); an estimate of the number, species, and size of fish in each condition; and the location of fish relative to construction operations will be noted. If any dead Endangered Species Act-listed species are present, samples will be frozen in secure storage under chain-of-custody for possible agency inspection. Additional fish and water sampling may be conducted at the direction of the resource agencies.

4.1.4 Discharge of Oil, Fuel, or Chemicals

In the event of a discharge of oil, fuel, or chemicals, work will stop and containment and cleanup efforts will be completed as soon as possible. Work may resume only after the source of the spill or leak has been identified and controlled, as long as the work does not interfere with, delay, or hinder the containment and cleanup efforts. Cleanup

includes appropriate disposal of any spilled material and cleanup material. The following agencies will be immediately notified:

- Ecology's Spill Response Office, (360) 407-6300
- Washington Military Department's EMD, (800) 258-5990
- National Response Center, (800) 424-8802
- Oregon Emergency Response Service (OERS), (800) 452-0311

4.2 NOTIFICATION

In the case of any in-water work that is out of compliance with the discharges approved under the Section 401 Water Quality Certification and the NPDES CGP construction stormwater permit for this project, the attendant project personnel will immediately notify the Project Engineer or their designee, who will notify Lori Kingsbury, Federal Permit Manager, Ecology Southwest Regional Office at (360) 407-6926, or by e-mail at loch461@ecy.wa.gov. Notification to Ecology must be made within 24 hours of the occurrence. A detailed written report will be submitted to Ecology within 5 days after the notification. The report will include the following information:

- Nature, extent, and duration of the water quality exceedance, including detailed visual observations and, if appropriate, field parameter measurements
- Identification of the likely cause of the exceedance
- Description of control measures or BMPs implemented to mitigate the exceedance
- Notifications to agency, including timing and names of agency personnel contacted
- Documentation that control measures were effective at mitigating the water quality exceedance and stabilizing environmental conditions in the construction area

EPA and USACE will also be notified at the following addresses.

USEPA – Region 10
NPDES Compliance Unit – Attn: Federal Facilities Compliance Officer
1200 6th Ave, Suite 900
OCE-133
Seattle, WA 98101
(206) 553-1846

U.S. Army Corps of Engineers
Attn: Eric Bluhm
PO Box 2946
333 SW First Ave
Portland, OR 97204
(503) 808-4759

5.0 REFERENCES

AECOM. 2015a. Mouth of the Columbia River Jetty A Major Rehabilitation. Jetty A Mitigation Options for Non-Wetland Water Impacts. January 28.

AECOM. 2015b. Mouth of the Columbia River Jetty A Major Rehabilitation. Jetty A Wetland Mitigation Options. January 27.

Ecology (Washington Department of Ecology). 2012. Stormwater Management Manual for Western Washington, Volume II: Construction Stormwater Pollution Prevention. Washington State Department of Ecology Water Quality Program. August 2012.

Moffat & Nichol. 2014. Jetty A Construction Access Alternatives – Task 7 Report. December 10.

USACE (U.S. Army Corps of Engineers). 2015. Mouth of the Columbia River—Jetty A Wetland Delineation Memorandum. U.S. Army Corps of Engineers, Portland District. February 2015.

USACE. 2012a. Revised Final Environmental Assessment: Rehabilitation of the Jetty System at the Mouth of the Columbia River. U.S. Army Corps of Engineers, Portland District. May 2012.

USACE. 2012b. Revised Clean Water Act Section 404(b)(1) Evaluation For Major Rehabilitation of the Jetty System at the Mouth of the Columbia River in Pacific County, Washington and Clatsop County, Oregon. June.

Appendix A

Water Quality Monitoring Form

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Turbidity Monitoring Form

For use on Corps projects requiring 401 WQC turbidity monitoring

Project, Permit & Contact Information												
Project Name:	**MCR Jetty A Rehabilitation Project**					Contract #		**Permit Information**	
Address/Location:	**Top of Jetty**	City	**Ilwaco, WA**		County	**Pacific**	401 Cert #	
							Instream Work Start:	
Contacts		Phone #		Cell #		Fax #	Instream Work End:	
Corps Project Manager:	**Eric Bluhm**	**503-808-4759**					Extension Date:	
Corps PME Contact:	**Barbara Cisneros**	**503-808-4784**						
Corps COR:	**Jeff Edwards**	**541-501-1896**						
Corps Inspector:	**Ed Saldana**	**503-784-5921**		**503-784-5921**				
Contractor Supervisor:							WA DOE -Contact/Phone	**Lori Kingsbury (360) 407-6167**
Contractor Inspector:							EPA-Contact/Phone	**Margaret McCoughly (206) 553-1772**

Monitoring Individual's Name	DATE	Work Start/ End TIME	TIME of Observ-ation	TIDAL STAGE and Direction (ebb or flood)	Weather	**Photo ID(s)**	Back-ground 500 ft up-current (Plume observed: yes or no)	Within 150 ft of Discharge Location (Plume observed: yes or no)	Compli-ance Point 150 ft down-current (Plume observed: yes or no)	Difference in plumes (color/ clarity/ sheen/ etc.)	COMMENTS -- if turbidity was visible or exceeded background levels at interim checks, how was work modified to reduce turbidity? Which Best Management Practices (BMPs) were implemented pre and post reading? No plume observed, continue to monitor every 4 hours

Turbidity Monitoring Instructions:

- At the start of work and every 4 hours thereafter, visually assess and photograph the background levels approximately 500 ft up current of the work site, in undisturbed water. This is the representative background point.
- Then visually assess and photograph the compliance measurement approximately 150 ft down current of work site in a representative location.
- When monitoring visually, turbidity that is visible over background is considered an exceedence of the standard.
- If an exceedence over the background level occurs within 150 feet of work site, modify the activity and/or BMPs and continue to monitor every four hours.
- If an exceedence over the background level continues within 150 feet of work site at the second monitoring interval, the activity must stop until the turbidity levels return to background. If, however, turbidity levels return to background at second monitoring level due to implementation of BMPs or natural attenuation, work may continue with appropriate monitoring as above.
- During visual monitoring, stop work after 8 hours with an observed plume wihin 150 feet or an observed plume greater than 150 feet of the work site.

Visual Monitoring		
No Plume Observed	Continue to monitor every 4 hours	Continue to monitor every 4 hours
Plume observed within compliance distance	Modify BMPs and continue to monitor every 4 hours	Stop work after 8 hours with an observed plume within compliance distance
Plume observed beyond compliance distance	Stop Work	Stop Work

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JARPA Appendix I
Stormwater Pollution Prevention Plan (SWPPP)

For
Rehabilitation of Jetty A
Near the Mouth of the Columbia River, Pacific County, Washington

Submitted by the U.S. Army Corps of Engineers, Portland District, Civil Works

Please Note: The SWPPP for this Project will be submitted separately at a future date.

April 2015

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JARPA Appendix J
No-test determination email from the Portland Sediment Evaluation Team (PSET)

For
Rehabilitation of Jetty A
Near the Mouth of the Columbia River, Pacific County, Washington

Submitted by the U.S. Army Corps of Engineers, Portland District, Civil Works

April 2015

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From:	McMillan, James M NWP
To:	Cisneros, Barbara G NWP
Cc:	Humphrey, Christopher C NWP; Bluhm, Eric V NWP; "Freedman, Jonathan"; "Lohrman, Bridgette"; "Inouye, Laura (ECY)"; "Jeremy_Buck@fws.gov"; "jeffrey.lockwood@noaa.gov"; "ANDERSON Peter"; Holm, James A NWP
Subject:	RE: request for PSET REVIEW_ Fed Proj - MCR - North Jetty Lagoon Fill (UNCLASSIFIED)
Date:	Tuesday, April 22, 2014 4:00:00 PM

Classification: UNCLASSIFIED
Caveats: NONE

Barbara,

The Portland Sediment Evaluation Team (PSET) has reviewed the February 14, 2014 "Design Documentation Report (60%): Mouth of the Columbia River, North Jetty Lagoon Fill" (DDR) and concurs with your request for a sediment testing exemption per the 2009 Sediment Evaluation Framework for the Pacific Northwest (SEF).

PROJECT DESCRIPTION: The North Jetty is located near Ilwaco, Pacific County, Washington, at the Mouth of the Columbia River (MCR). Structural degradation of the 100 year-old North Jetty has accelerated in recent years because of storm activity, loss of sand shoal material at its foundation (Peacock Spit), and continued recession of the jetty head. The adjacent lagoon appears to be formed primarily by the erosion and piping of accreted sand with tidal exchange and wave surge through the deteriorated jetty structure.

The North Jetty Lagoon Fill and Culvert Replacement Project is a critical component of the repair actions proposed to rehabilitate the MCR jetty system. The proposed project includes in-filling nearly 5,000 feet of eroded area behind the North Jetty root between jetty stations 10+00 and 60+00 and improving the McKenzie Head Lagoon culvert system. The proposed lagoon fill will address the erosion and migration of soil through the jetty by limiting the hydraulic transmissivity of the jetty structure. It is anticipated that this will be achieved by constructing a graded rock filter on the landward side of the jetty designed to retain the sand material found on site.

The rock filter will consist of three material layers placed along the northern jetty face:
1. Layer 1 – Large rock used to fill the largest voids on the jetty surface (~18" thick).
2. Layer 2 – Shot rock fill used to fill the smaller voids on the jetty surface and reduce the overall void space and permeability to retain Layer 3 fill material. Minimum 5 ft. thickness.
3. Layer 3 – Drain rock used to retain and filter targeted sand materials (~1 ft. thick).

Due to the preliminary nature of the jetty fill design, total fill volumes are not available. Material will be sourced from four quarries (located in northwest Oregon and southwest Washington) within hauling distance of the project area.

SOURCES OF CONTAMINATION: Near the project area, potential sediment contamination sources include vessel traffic and the nearby communities of Ilwaco and Chinook, Washington. However, these sources are far-removed from the jetty.

Local project sediments consists of medium to coarse sand, indicative of the high-energy waves and river discharge at the MCR jetties. The North Jetty fill material consists of coarse-grained gravel, cobbles, and boulders, and the material will be sourced from one or more quarries that are far-removed from sources of contamination. As such, both the parent sediment and the proposed fill material are unlikely to contain contaminants at concentrations above the marine benthic toxicity screening levels published in the 2009 SEF.

REGULATORY REQUIREMENTS FOR SEDIMENT EVALUATION: In accordance with section 404 of the Clean Water Act (40 CFR 260.60) and the 2009 SEF guidance, projects may be excluded from chemical testing if the following conditions are met:

1. Project sediments are composed of sand, gravel or other naturally occurring inert material in areas of

high current with large bedloads or shifting bars and channels (>80% coarse-grained material and less than 0.5% total organic carbon [TOC] content); AND

2. The project area is sufficiently removed from sources of pollution to provide reasonable assurance that the proposed discharge material is not a carrier of contaminants.

NO-TEST DETERMINATION: Based on the information provided in the DDR for the North Jetty Lagoon Fill and Culvert Replacement Project, the project meets the conditions for exclusion from chemical testing. Per the SEF guidance, the PSET has determined that the proposed jetty fill materials are suitable for unconfined, aquatic placement; sediment chemical testing is not required.

If you have questions regarding our determination, please feel free to email or call me.

Regards,
James

James M. McMillan
Lead - Portland Sediment Evaluation Team
U.S. Army Corps of Engineers
CENWP-EC-HR (Sediment Quality)
333 SW First Avenue, P.O. Box 2946
Portland, Oregon 97208-2946
tel: 503.808.4376 fax: 503.808.4875

-----Original Message-----
From: Cisneros, Barbara G NWP
Sent: Monday, March 17, 2014 1:41 PM
To: McMillan, James M NWP
Cc: Isakson, Melody A NWP; Humphrey, Christopher C NWP; Bluhm, Eric V NWP
Subject: FW: request for PSET REVIEW_ Fed Proj - MCR - North Jetty Lagoon Fill (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi James & Melody,

$900 resourced to G2L1MR0 - Correct? Thanks all,

-BGC

Barbara Geren Cisneros
Environmental Resource Specialist
U.S. Army Corps of Engineers¦Environmental Planning Section¦
P.O. Box 2946¦Portland, OR¦97208-2946¦
503-808-4784¦(FAX) 503-808-4756
Barbara.G.Cisneros@usace.army.mil

-----Original Message-----
From: Isakson, Melody A NWP
Sent: Monday, March 17, 2014 1:22 PM
To: Humphrey, Christopher C NWP
Cc: Cisneros, Barbara G NWP
Subject: RE: request for PSET REVIEW_ Fed Proj - MCR - North Jetty Lagoon Fill (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi Chris,

No, just as long as you have authorized or given the OK as the tech lead then it's fine. So, I need his ORG CODE and how much you want to fund for his labor code for?

Thanks!

-----Original Message-----
From: Humphrey, Christopher C NWP
Sent: Monday, March 17, 2014 12:16 PM
To: Isakson, Melody A NWP
Cc: Cisneros, Barbara G NWP
Subject: FW: request for PSET REVIEW_ Fed Proj - MCR - North Jetty Lagoon Fill (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi Melody,

Looks like Barbara needs James McMillan spearhead as review; and he's asking for labor. Eric is currently on leave. Would you be able to get James a labor code, or do you need eric to give you an OK first?

Thanks,
Chris

-----Original Message-----
From: McMillan, James M NWP
Sent: Monday, March 17, 2014 9:38 AM
To: Cisneros, Barbara G NWP
Cc: Bluhm, Eric V NWP; Humphrey, Christopher C NWP
Subject: RE: request for PSET REVIEW_ Fed Proj - MCR - North Jetty Lagoon Fill (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Barbara,

Question: Who's in charge of labor? I need $900 resourced to G2L1MR0 to conduct the interagency review.

Thanks,
JMc

-----Original Message-----
From: Cisneros, Barbara G NWP
Sent: Friday, March 14, 2014 5:31 PM
To: McMillan, James M NWP
Cc: Cisneros, Barbara G NWP; Bluhm, Eric V NWP; Humphrey, Christopher C NWP; Chuck Ebel (CEbel@harborengineers.com); Brian Abel
Subject: request for PSET REVIEW_ Fed Proj - MCR - North Jetty Lagoon Fill (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi James,

Per our conversation this week, North Jetty Lagoon Fill will be moving forward this year, including a request for water quality certification from DOE. I believe a PSET review is required for seeking a WQC

in WA.

We have been working with DOE and the other agencies to let them know our anticipated project time line, wetlands and waters impacts etc. As discussed, I am assuming we need a PSET determination from the team. I have attached portions of the 60% DDR. At this time, we anticipate using fill from onsite as part of mass balance transfer into the lagoon, and then to supplement with sand and rock from the existing quarries described in the report. We will restore a portion of the area as an intertidal wetland, and the rest will become a storage and staging area for near-future jetty stone. The borrow area and wetland creation are developments since the 60% submittal and will be included in greater detail at 90%. Since we are only at 60% DDR, there will continue to be some design change, but I don't think it will involve a change in the greater concept.

Also because we are at 60% design, I am not sure this is ready to be released to the greater public. I don't know how much the team needs to review, and I have copied Chris and Eric and our contractors in case there are any concerns with limited release of these portions of the report. I also tried to remove all portions of the report related to cost-estimates, etc. that might be sensitive internal data. Please let me know if you need further information, and I am happy to provide you updates of the DDR and P&S as they become available. Thanks for your help.

Have a good weekend,
Barbara

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Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

JARPA Appendix K
Mouth of the Columbia River—Jetty A Wetland Delineation Memorandum

For
Rehabilitation of Jetty A
Near the Mouth of the Columbia River, Pacific County, Washington

Submitted by the U.S. Army Corps of Engineers, Portland District, Civil Works

US Army Corps of Engineers
Portland District

April 2015

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US Army Corps of Engineers ®
Portland District

U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT

Mouth of the Columbia River – Jetty A
Wetland Delineation Memorandum

Columbia River, Approximate River Mile 3
Pacific County, Washington

5 February 2015

Prepared for:
CENWP-PM-E

Prepared by:
James A. Holm
CENWP-EC-HR

Technical Review:
James McMillan
CENWP-EC-HR

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Figures

Appendix

1.0 PROJECT DESCRIPTION AND SITE HISTORY

1.1 PROJECT LOCATION AND DESCRIPTION

Jetty A is located on the north side of the mouth of the Columbia River estuary, near Ilwaco, in Pacific County, Washington (Figure 1). The U.S. Army Corps of Engineers, Portland District (Corps) is evaluating options for the repair of Jetty A, which is a part of the Mouth of the Columbia River (MCR) federal navigation project. The staging area and access route for the jetty repair could include the U.S. Coast Guard (USCG) Cape Disappointment Station adjacent to Jetty A.

The revised study area includes the USCG facility, its access road, and the root area of Jetty A (Figure 2). The revised study area is approximately 24 acres and Jetty A extends south from the site for approximately 4,200 feet. The study area is contiguous with Pacific Ocean to the southwest, the Columbia River estuary to the southeast, the western channel to Baker Bay on the northeast, and the rocky uplands of the USCG facility and the Cape Disappointment State Park to the northwest.

The study area largely consists of three areas: a low sandy beach area along the southeast to northeast boundary, a low (<+20 feet NAVD88) bench area that is forested to the south and east, and a periodically maintained upper terrace that has been previously filled and graded. The study area elevations range from 0 feet Mean Lower Low Water (MLLW) at the low-water edge of the beach areas up to +30 feet on the upper terrace near the former shooting range.

A wetland delineation report of the study area was previously completed in May 2011 (Tetra Tech, Inc. 2011). The Corps is updating the report to address comments from the Washington Department of Ecology (Ecology), address site changes, and include the USCG access road area. The purpose of the additional work is to clarify the number and acreages of wetlands, verify previously mapped wetland types, and delineate the mean higher high tide lines along the edges of the study area.

1.2 SITE HISTORY INFORMATION

1.2.1 Site History

Jetty A was constructed in 1939 to a length of 1.1 miles. Its purpose is to protect the North Jetty and stabilize navigation channels for the MCR project. The jetty has receded approximately 900 feet since 1939. The jetty is expected to recede at a rate of 5 to 20 feet per year (USACE 2012).

The Jetty A study site is currently utilized by the USCG staff for training exercises, helicopter landing, storage, and off-duty recreation. Public access is prohibited. The study area has been previously used by USCG for ATV training, a shooting range, and a dump area.

The July 2012 aerial photograph (Figure 2) of the study area reflects the current site conditions, with the exception of the rapidly receding southeastern shoreline and the slow erosion of the southwestern bank. The southeastern shoreline along the Columbia River is incrementally eroding in a northwesterly direction towards the low bench area. Since 1996 (Figure 3) , approximately 870 feet of low vegetated terrace has eroded, turning that area into unvegetated shallow waters and sandy beaches. The rate of erosion has varied over time but has not abated due the sandy nature of the low terrace and beach.

The southwestern bank that is directly exposed to ocean storm events and strong river currents has receded approximately 90 feet since 1996. This erosion is lesser due to armoring by large diameter basalt boulders and the compacted nature of the upper terrace.

1.2.2 Landscape Setting and Land Use

The MCR Jetty A is located within the Columbia River estuary and it is contiguous with Cape Disappointment State Park and USCG facility. This area is used for recreation on the state park property and by the USCG for their search and rescue mission and maritime law enforcement presence. The Columbia River is one of the nation's largest rivers for the import and export of goods.

2.0 METHODS

2.1 OFFICE INVESTIGATION

Prior to performing the site investigations, aerial photographs and topographic surveys of the study area were reviewed. The previous wetland delineation was also reviewed to determine areas of interest. Ecology's "Washington State Wetland Rating System for Western Washington: 2014 Update" was reviewed for applicability to the study area wetlands and to assess their functions and values (Hurby 2014).

Based on the office reconnaissance and previous comments from Ecology staff, the field investigation focused on potential staging areas, previously delineated wetlands, forested low bench area, the root of Jetty A, and the mean higher high tide lines. Six specific tasks were identified:

1. Extend the survey area 100 feet out along the Jetty A root;
2. Verify the absence or presence of wetland JA3;
3. Survey the forested area on the lower terrace along the northeast portion of the study area for wetlands;
4. Ground truth the vegetation types for wetland JA1 and JA2 and their ratings;
5. Ground truth the boundaries of other waters of the U.S. (mud/sand flats, new wetlands); and
6. Identify the mean higher high tide lines along the northern, eastern, and southern study area limits.

An additional item was included based on the recommendation of the project team. To accommodate the turning radius of heavy equipment and dump truck traffic to the Jetty A staging area, the USCG access road may need to be widened at one sharp turn in the road, southeast of the USCG office

buildings (Figure 2). The Corps investigated this area to determine if roadside/estuarine wetlands were present.

2.2 FIELD INVESTIGATION

The field investigation was conducted by two Corps staff trained in the use of the Corps' 1987 wetland delineation manual and applicable regional wetland delineation supplements. The 2014 update for the Washington State Wetland Rating System for Western Washington was used to evaluate wetland functions and values. The study area was surveyed for wetlands on December 4 and 15, 2014. Based on prior office reconnaissance of aerial photographs and TetraTech's 2011 delineation report, Corps staff inspected the entire study area and accessed the site via the USCG access road.

Corps staff investigated the upland terrace on foot, noting vegetation types and wetland boundaries for JA1 and JA2. Corps staff investigated the southern tide line that is exposed to the Pacific Ocean swells and waves. The northern and eastern tide lines were walked by foot with close attention to field indicators of the high tide line. The interior of the lower forested bench area was investigated for the presence of wetland JA3 (identified in the 2011 TetraTech report, but not observed by Ecology staff). The Jetty A root area was surveyed to determine wetland presence/absence and current high tide line.

New wetland areas were encountered and paired wetland and upland data points with soil test pits were recorded in accordance with the Corps' wetland delineation manual and applicable regional wetland delineation supplement. Wetland hydrology indicators, hydric soil indicators, and presence of hydrophytic vegetation were documented during the field investigation. The wetland-upland boundaries and test pits were recorded with a hand-held GPS. Each wetland was evaluated using the Washington State rapid assessment protocol. Wetland delineation data forms and wetland rating forms are located in the report appendix.

2.3 SITE CONDITIONS

The weather was mostly cloudy both days with air temperatures ranging from 40 to 50 degrees F. Light to moderate, 5 to 15 mile per hour winds, typically from the west, were present. Light precipitation was encountered during the second site investigation on December 15, 2014.

3.0 DESCRIPTIONS OF WETLANDS AND NON-WETLAND WATERS

3.1 WETLANDS

Five wetlands were observed in the study area. Their total wetland acreage within the study area is approximately 0.54 acres.

Wetland JA1. Wetland JA1 (Photograph 1) was previously delineated by TetraTech in 2011. Its revised total acreage is 0.37 acre, including a separated very small 1,100 sq. ft. area (JA1N) to the north. Three additional upland test pits were examined, which reduced the previous acreage of this wetland and separated area JA1N from the main body of wetland JA1. Wetland s JA1 and JA1N are located in the center of the upper terrace and they are bisected by a two-track path (Figure 4). The palustrine

emergent (PEM) wetland was re-rated using the updated 2014 Washington State protocol. It received a score of 19 and is considered a Category III wetland based on its functions.

Wetland JA2. Wetland JA2 (Photograph 2) was previously delineated in 2011. Its acreage is 0.12 acre. It is located on the upper terrace, near the USCG helicopter pad (Figure 4). The palustrine emergent (PEM) wetland was re-rated using the updated 2014 Washington State protocol. It received a score of 19 and is considered a Category III wetland based on its functions.

Wetland JA3. The previously delineated wetland JA3 was not located on either site investigation in December 2014. This wetland no longer exists or was misidentified; the area in question consisted of a dune grass-dominated depression within the forested low bench area. Therefore, wetland JA3was removed from the study area and wetland total.

Wetland JA4. Wetland JA4 was not previously delineated in 2011. Its area is only 270 sq. ft. and it is located at the root of Jetty A (Figure 4). It is precariously perched above the eroding upstream edge of the jetty root and will likely be undercut in a few years. Even though it is very small, the palustrine emergent (PEM) wetland was rated using the updated 2014 Washington State protocol. It received a score of 18 and is considered a Category III wetland based on its functions.

Wetland JA5. Wetland JA5 (Photograph 8) was not previously delineated in 2011. Its area is only 500 sq. ft. and it is located on the upper terrace, east of the USCG two-track path (Figure 4). Even though it is very small, the palustrine emergent (PEM) wetland was rated using the updated 2014 Washington State protocol. It received a score of 19 and is considered a Category III wetland based on its functions.

Wetland JA6. Wetland JA6 (Photograph 6) was outside the 2011 wetland study area. The portion of tidal fringe wetland area that is within the study area is approximately 1,650 sq. ft. The fringe wetland is located water ward of the USCG access road and main buildings (Figure 4). It is located down slope of the mowed and maintained road right-of-way and it is hydrologically feed by a 24-inch concrete culvert under the road and by tidal fluctuations. The upslope portion of the wetland to be affected by road widening is dominated by reed canary grass. It is a part of much larger tidal fringe wetland that extends to the northwest along the sheltered cove. Further from shore, the wetland vegetation shifts to salt-tolerant species and intertidal mudflats. This larger estuarine, intertidal, emergent (E2EM1) wetland was evaluated using the Special Characteristics section of the updated 2014 Washington State protocol. It is considered a Category I wetland because it is an estuarine wetland that is partially with a state park.

3.2 NON-WETLAND WATERS

The mean higher high tide (MHHT) line was determined on three sides of the study area using field indicators and estimating MHHT elevations from the known elevation at the benchmark for the root of Jetty A. The Jetty A benchmark has an elevation of +20.7 feet in NAVD88.

Southern MHHT Line. The MHHT along the southern edge (Photograph 7) of the study area is constantly exposed to ocean swells and waves that enter the mouth of the Columbia River, between the North Jetty and South Jetty. The force of the waves along this boundary is much higher than the other MHHT

lines of the site. The MHHT line on the southern portion of the site was estimated at +14 feet (NAVD88) due to the presence of debris (flotsam, drift wood) and bank erosion.

Eastern MHHT Line. The MHHT along the eastern edge (Photographs 4 and 5) of the study area protected from direct ocean swells by Jetty A. However, this beach area is actively eroding to the west and north from tidal cycles within the lower Columbia River. Due to the active erosion of the forested, low bench area, large woody debris (trees, saplings) are entering the aquatic system and creating in-water habitat and structure within the intertidal zone. The MHHT line on the eastern portion of the site was estimated at +11.2 feet (NAVD88) due to the presence of debris (flotsam, drift wood, bank erosion, and debris line) and measuring the difference (9.5 ft) from the MHHT to the elevation of the Jetty A benchmark (+20.7 ft NAVD88).

Northern MHHT Line. The MHHT along the northern edge (Photograph 3) of the study area is more protected from tidal action, because it is located along the western access channel to Baker Bay and the large sand bar at the eastern corner of the site locally deflects much of the wave energy coming into Baker Bay. This boundary is relatively stable compared to the other two aquatic boundaries of the site. The MHHT line on the northern portion of the site was estimated at +10 feet (NAVD88) due to the presence of debris (flotsam, driftwood, vegetation matting).

4.0 CONCLUSIONS

The field investigation indentified five wetlands (4 palustrine and 1 estuarine, totaling 0.54 acre) within the boundaries of the revised study area. The four palustrine wetlands (0.50 acre) identified in this wetland investigation appear to have been artificially created during site development and placement of fill materials on the site for construction of Jetty A and the USCG facilities. As such the palustrine wetlands are of moderate value, as ranked under the 2014 Washington protocol. The 0.4-acre portion of the tidal fringe wetland (along the USCG access road) is dominated by reed canary grass, but it is up gradient of higher-value intertidal wetlands along the sheltered cove.

The MHHT line varies along the margins of the study area due to differences in the energy of wave action and tidal forces of open ocean swells, lower Columbia River waves, and the sheltered nature of Baker Bay.

5.0 REFERENCES

Cooke, S. S. ed. 1997. *A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon*. Seattle Audubon Society and Washington Plant Society, Seattle, WA. 417 pp.

Hurby, T. 2014. *Washington State Wetland Rating System for Western Washington: 2014 Update*. Department of Ecology Publication # 14-06-029, Olympia, WA. 126 pp + Appendices

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Figure 1: Location Map of MCR Jetty A, Pacific County, Washington (Source: USACE).

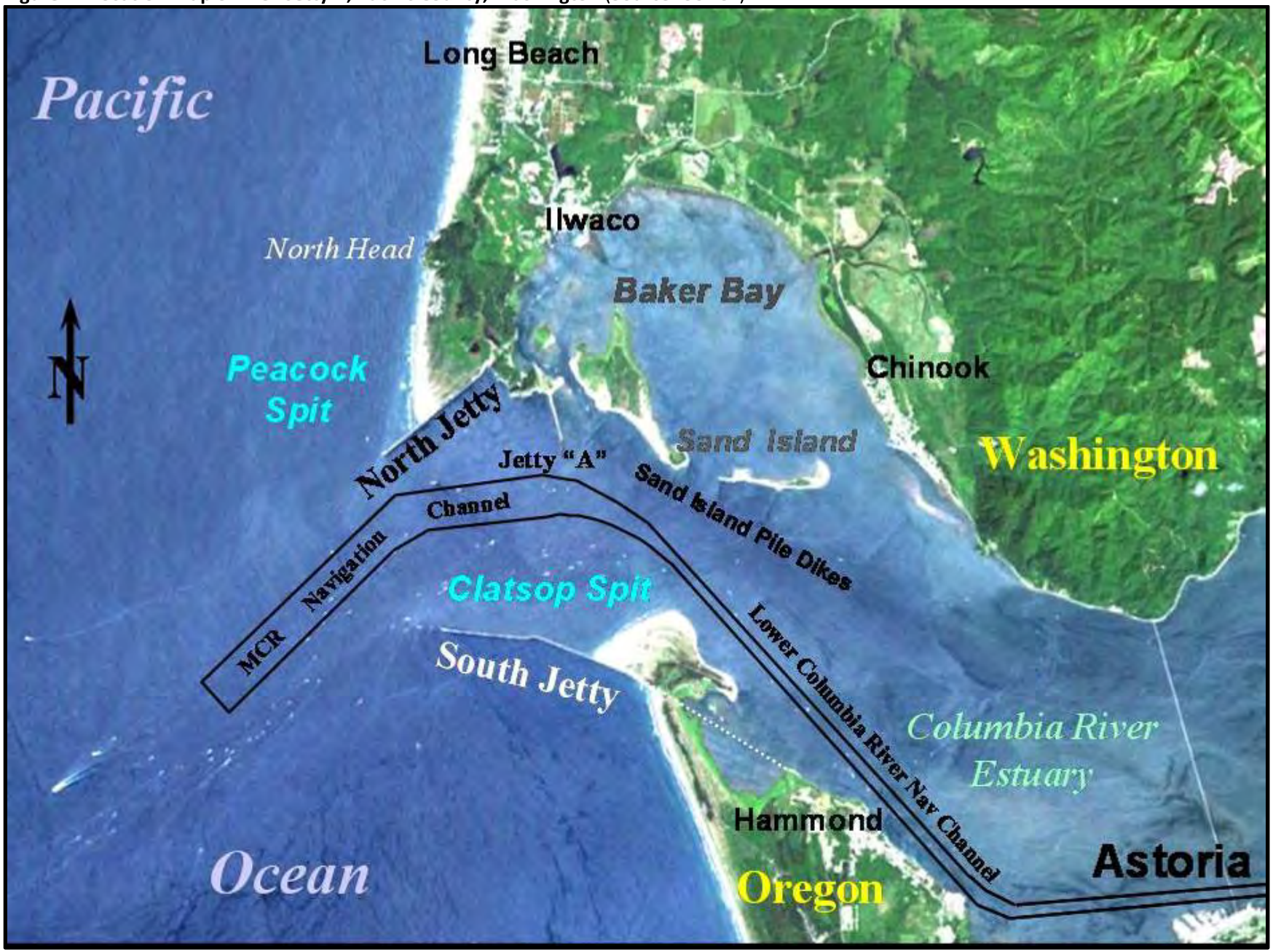


Figure 2: MCR Jetty A Revised Study Area (2012 Aerial Photograph) (Source: Google Earth)**.**

Figure 3: 1996 Aerial Photograph of MCR Jetty A (Source: Google Maps)**.**

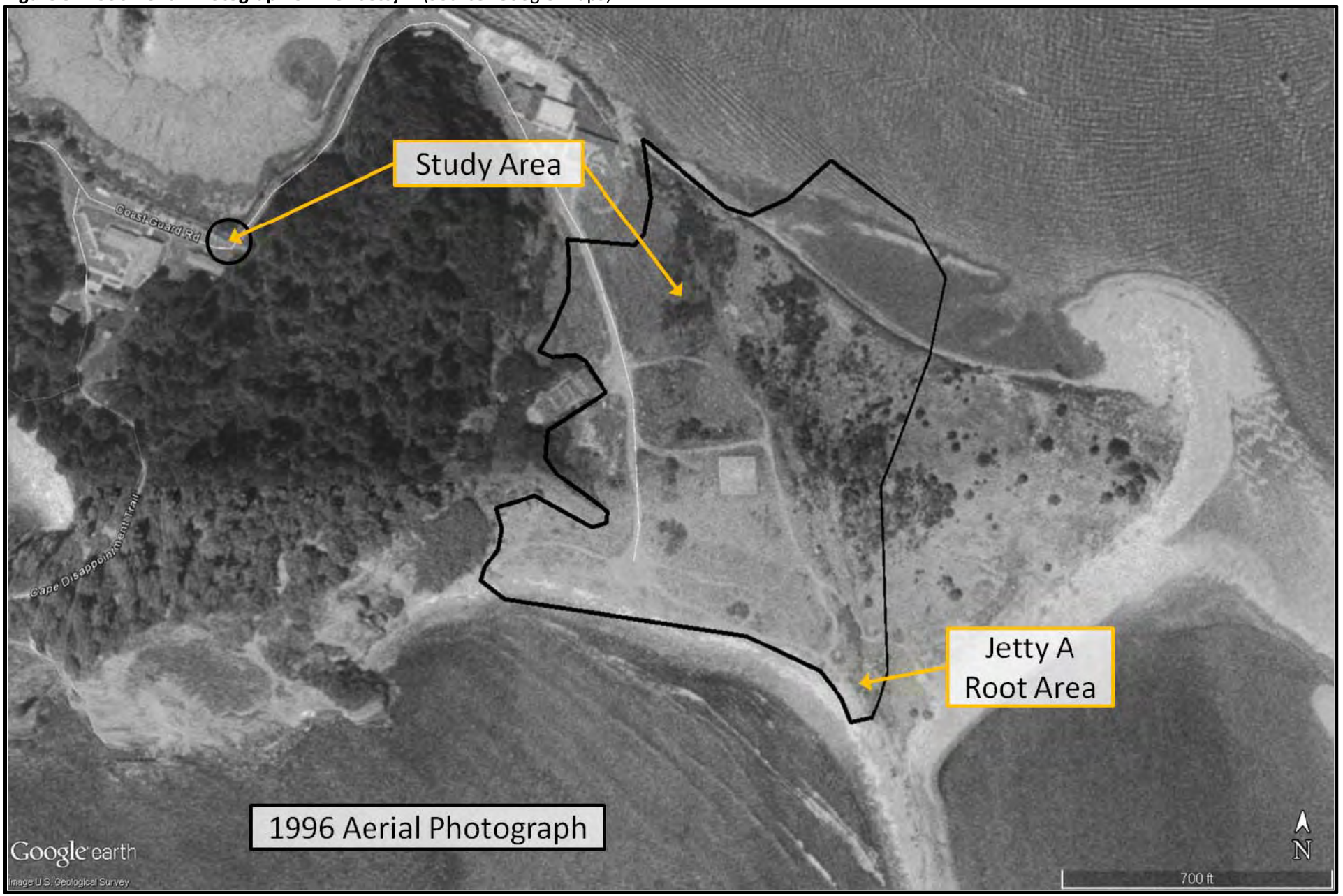
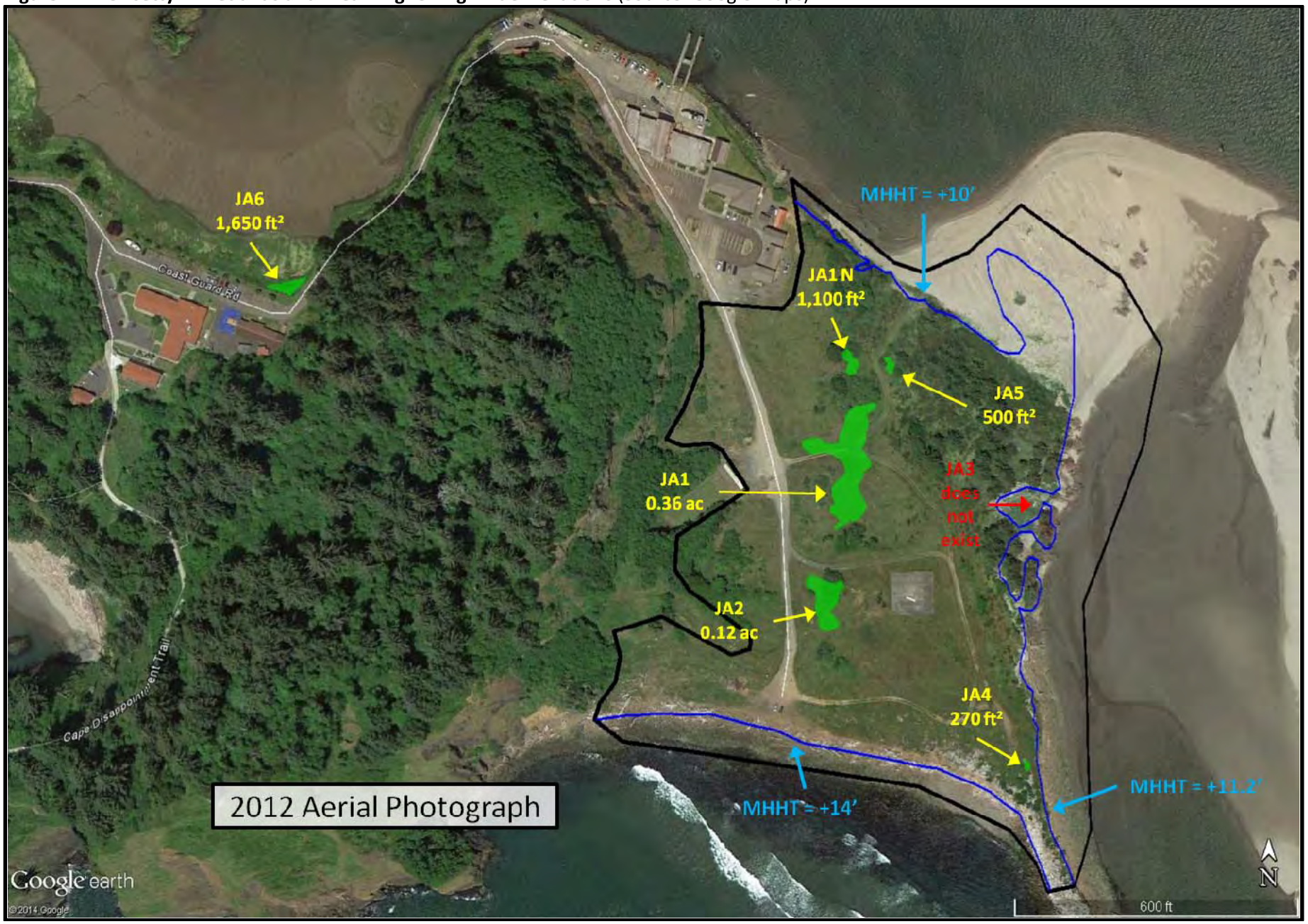


Figure 4: MCR Jetty A Wetlands and Mean Higher High Tide Elevations (Source: Google Maps).



APPENDIX

PHOTOGRAPH LOG

WETLAND DELINEATION DATA FORMS/WETLAND RATING FORMS

Photograph 1. Facing north, a view of Wetland JA1.

Photograph 2. Facing west, a view of Wetland JA2.

Photograph 3. Facing southeast, a view of the MHHT on the northern boundary.

Photograph 4. Facing south, a view of the MHHT along the eroding eastern bank of Jetty A.

Photograph 5. Facing north, a view of the beach area on the eastern site boundary.

Photograph 6. Facing northwest, a view of Wetland JA6 on the fringe of the cove.

Photograph 7. Facing west, a view of the southern MHHT line.

Photograph 8. Facing east, a view of Wetland JA5.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region Dec 15, 2014

Project/Site: MCR Jetty A City/County: Pacific County Sampling Date: ~~9-11-12~~

Applicant/Owner: USCG State: WA Sampling Point: WA1-42

Investigator(s): J. Holm J. McMillan Section, Township, Range: Sec 19 T 9N R 11W

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None Slope (%): 1%

Subregion (LRR): Northern CRRA Lat: 46° 16.704'N Long: 124° 2.648'W Datum: NAD 83

Soil Map Unit Name: Dune land (35) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Y Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Oxyloma pisa	50	Y	FACW
2. Bear Lagrass / Elymus salinus	20	Y	FACW
3. Plantago	10	—	
4. Salt Grass Distichlis	20	Y	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	____ = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

Mowed periodically Broad ruts

SOIL

Sampling Point: JA1-42

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR3/2	100	—				SiL loam	
3-8	10YR3/2	25	—				Extremely gravelly SiL loam	
		75	—				Gravel / Cobble fill	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Rocks >75% fill

Earthworms

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: light rain drops

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: MCR Jetty A City/County: Pacific County Sampling Date: Dec 15, 2014
Applicant/Owner: USCG State: WA Sampling Point: SA1-43
Investigator(s): J. Holm, J. McMillan Section, Township, Range: Sec 9, T9N, R11W
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none) none Slope (%): 1%
Subregion (LRR): Northern LRR A Lat: 46° 16.717'N Long: 124° 2.619'W Datum: NAD83
Soil Map Unit Name: Dune land (35) NWI classification: —
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	Is the Sampled Area within a Wetland? Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks: Rockfill soil = non native

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Alder	60	Yes	FACW
2. Spruce	10	—	FAC
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Swamp fern	15	—	FACU
2. English Ivy	20	Yes	FACW
3. Reed Canarygrass Himalayan	15	—	FACU
4. Reed Canarygrass	10	—	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	—
FACW species	2	x 2 =	4
FAC species	1	x 3 =	3
FACU species	3	x 4 =	12
UPL species	0	x 5 =	—
Column Totals:	6 (A)		19 (B)

Prevalence Index = B/A = 3.17

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: A1-U3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Loam	
4+								Rock, Root, Cobble

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:
Roots - Fill
Rock

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: MCR Jetty A City/County: Pacific Co. Sampling Date: Dec 15
Applicant/Owner: USCG State: WA Sampling Point: WA1-WL1
Investigator(s): J. Hahn, J. McMillan Section, Township, Range: Sec 9, T9N, R11W
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None Slope (%): 1%
Subregion (LRR): LRR A Lat: 46°16.725'N Long: 124°2.621'W Datum: NAD83
Soil Map Unit Name: Dune Land (35) NWI classification: —
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? N Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Salal Bush	10	—	FACU
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ____)			
1. Rubus Himalayan	35	Y	FACU
2. Red Clover, Grass	35	Y	FACU
3. Beach grass, Elymus	20	Y	FACU
4. Bittercress, Asteraceae	10	—	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x 1 =	
FACW species	2	x 2 =	4
FAC species	—	x 3 =	
FACU species	3	x 4 =	12
UPL species	—	x 5 =	
Column Totals:	5 (A)		16 (B)

Prevalence Index = B/A = 3.2

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: A1-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR 4/4	100					SiL	
10+								Rocks & Cobble dM

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Earthworms

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Jetty A, MCR City/County: Pacific County Sampling Date: 4 Dec 2014
Applicant/Owner: USCG State: WA Sampling Point: JA4 Wet
Investigator(s): J. Holm J. McMillan Section, Township, Range: Sec 9 T9N R11W
Landform (hillslope, terrace, etc.): perched jetty root terrace Local relief (concave, convex, none): _____ Slope (%): 1%
Subregion (LRR): LRR A Lat: 46°16.590'N Long: 124°2.538'W Datum: NAD83
Soil Map Unit Name: Dune Land (35) NWI classification: PEMC
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil X, or Hydrology _____ significantly disturbed? Y Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	Is the Sampled Area within a Wetland? Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:
Perched wetland @ Jetty Root, small (27 ft²) area, on top of Jetty fill materials

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Slough sedge	65	Y	OBL
2. Rush (juncus)	15	–	FACW
3. Saltgrass	20	–	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	1 = Total Cover		

% Bare Ground in Herb Stratum 1%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
Total Number of Dominant Species Across All Strata: _____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
X 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: JA4W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR3/2	95	10YR4/6	5	C	M	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- X Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

@2" rock infill of cobbles <1½", surface of fine sediments, elev ~120', organic debris/mucky surface

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 2

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Perched on terrace, will erode away in modern years as leafy root undercut by wave action.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Jetty A, MCR City/County: Pacific County Sampling Date: 4 Dec 24

Applicant/Owner: Tribal, J. McMillan & USCG State: WA Sampling Point: JA4 up

Investigator(s): Section, Township, Range: Sec 9 T9N R11W

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None Slope (%): 1%

Subregion (LRR): Within CRRA Lat: 46° 16.589'N Long: 124° 2.540'W Datum: NAD83

Soil Map Unit Name: Dune land (35) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Scotch Broom	5	—	FACU
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Saltgrass	50	Y	FACW
2. Shinyleaf	<2	—	UBL
3. Hardhack	<2	—	FAC
4. Rubus Himalayan	10	—	FAC
5. Reed canary grass	20	Y	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	____ = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: YA4U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					sandy loam	
5+								Rock fill, stones

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Sits on bittyroot fill material

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: MCR Jetty A City/County: Pacific Co. Sampling Date: Dec 15, 2014

Applicant/Owner: USCG State: WA Sampling Point: JAS-W

Investigator(s): J. Holm, J. McMillan Section, Township, Range: Sec 9 T9N R11W

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): Convex Slope (%): 1%

Subregion (LRR): Willapa / RRA Lat: 46° 16.728' N Long: 124° 2.607' W Datum: NAD83

Soil Map Unit Name: Dune Land (35) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	Is the Sampled Area within a Wetland? Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Stipa/Leymus	80	Y	OBL
2. Juncus	10	Y	FACW
3. Grass Elymus	10	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: WS-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/2	100					Silt Loam	
5-19	10YR 4/3	70	10YR 4/1	30	Depletion			

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

Earthworm

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): _____

Water Table Present? Yes ___ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): _____

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: MCR Jetty A City/County: Pacific Co. Sampling Date: Dec 15 2004
Applicant/Owner: USCG State: WA Sampling Point: JA5 4
Investigator(s): J. Holm, J. McMillan Section, Township, Range: Sec 9 T9N R11W
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None Slope (%): 2%
Subregion (LRR): LRR A Lat: 46° 16.763'N Long: 124° 2.609'W Datum: NAD83
Soil Map Unit Name: Dune land (35) NWI classification: —
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X
Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ____)			
1. Sword fern	10	—	FACU
2. Beach grass	20	Y	FACU
3. Salt grass	30	Y	FACW
4. Ivy	10	—	FACU
5. Reed canary	10	—	FACW
6. Cat's ear	5	—	FACU
7. moss	10	—	—
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 80

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x 1 =	—
FACW species	2	x 2 =	4
FAC species	—	x 3 =	—
FACU species	3	x 4 =	12
UPL species	—	x 5 =	—
Column Totals:	5 (A)		16 (B)

Prevalence Index = B/A = 3.2

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: JA5-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					loamy sand	cracked rocks / cobble
4-17	10YR 4/4	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Jetty A, MCR City/County: Pacific Co. Sampling Date: Dec 4 2014

Applicant/Owner: USCG State: WA Sampling Point: JAG wet

Investigator(s): J. Holm & J. McMillan Section, Township, Range: Sec 9 T9N R11W

Landform (hillslope, terrace, etc.): Fidalgo Unundated flats Local relief (concave, convex, none): — Slope (%): <1%

Subregion (LRR): LRR A Willapa Lat: 46° 16.754'N Long: 124° 2.909°W Datum: NAD83

Soil Map Unit Name: Palix silt loam, 0-6% slope NWI classification: estuarine tidal fringe

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
wetland extends to NW, N, NE & becomes tidal flats/mixed diverse vegetation

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Willow	10%	—	FACW
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ____)			
1. Reed Canary grass	90%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: JP6 W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0–14	10YR 3/1	100	10YR 3/2	1	Rm	M	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

~4" vegetative detritus on surface, sulfuric smell is moderate

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except **MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 2"

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

tidally influenced trickles run off from uplands through under road (roadway & slope)

Concrete culvert (~18" dia) 2x11

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: JettyA, MCR / USCG City/County: Pacific Co. Sampling Date: Dec 4 2014

Applicant/Owner: USCG State: WA Sampling Point: JA6UP

Investigator(s): J. Holm & J. Mcmillan Section, Township, Range: Sec 9 T9N R11W

Landform (hillslope, terrace, etc.): roadway margin Local relief (concave, convex, none): Slope to bay Slope (%): 25

Subregion (LRR): LRR A Lowlands Lat: 46° 16' 753"N Long: 124° 2' 910"W Datum: NAD83

Soil Map Unit Name: Poly silt loam, 30-65% slope (115) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Wetland near USCG/Access Road that may be widen, this is mowed Right-of-way

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. ornamental Rhododendo	10%	—	FAC
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ____)			
1. Tussock grass	90%	Y	FAC
2. Bentgrass	5	—	FACU
3. Reed Canary grass	25%	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
regularly mowed

SOIL

Sampling Point: JD6 UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR3/3	100					loam	
3+								Road fill, gravel, pebble, rocks, asphalt

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

soils, compacted $ dumped rock/base fill materials for roadway

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except **MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

None

Wetland name or number JA1

RATING SUMMARY – Western Washington

Name of wetland (or ID #): JA1 Date of site visit: 4 Dec 2014

Rated by J. Holm, J. McMillan Trained by Ecology? __ Yes X No Date of training ____

HGM Class used for rating Depression/Flats Wetland has multiple HGM classes? ___ Y X N

NOTE: Form is not complete without the figures requested *(figures can be combined).*

Source of base aerial photo/map GoogleEarth

OVERALL WETLAND CATEGORY III (based on functions X or special characteristics ___)

1. Category of wetland based on FUNCTIONS

___ **Category I** – Total score = 23 - 27

___ **Category II** – Total score = 20 - 22

X **Category III** – Total score = 16 - 19

___ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	H M (L)	
Landscape Potential	H M (L)	H M (L)	(H) M L	
Value	(H) M L	(H) M L	(H) M L	TOTAL
Score Based on Ratings	6	6	7	19

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	

Wetland name or number JM1

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number W1

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?

D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1		3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*. Yes = 4 No = 0		0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > 1/10 of area points = 1 Wetland has persistent, ungrazed plants < 1/10 of area points = 0		5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0		0
Total for D 1	Add the points in the boxes above	8

Rating of Site Potential If score is: ___**12-16 = H** 8 **6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?

D 2.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___**3 or 4 = H** ___**1 or 2 = M** 0 **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?

D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?	Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?	Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)?	Yes = 2 No = 0	2
Total for D 3	Add the points in the boxes above	3

Rating of Value If score is: 3 **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number JA1

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland:

- Wetland is a depression or flat depression with no surface water leaving it (no outlet) — points = (4)
- Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet — points = 2
- Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch — points = 1
- Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing — points = 0

→ 4

D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*

- Marks of ponding are 3 ft or more above the surface or bottom of outlet — points = 7
- Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet — points = 5
- Marks are at least 0,5 ft to < 2 ft from surface or bottom of outlet — points = (3)
- The wetland is a "headwater" wetland — points = 3
- Wetland is flat but has small depressions on the surface that trap water — points = 1
- Marks of ponding less than 0.5 ft (6 in) — points = 0

→ 3

D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*

- The area of the basin is less than 10 times the area of the unit — points = 5
- The area of the basin is 10 to 100 times the area of the unit — points = (3)
- The area of the basin is more than 100 times the area of the unit — points = (0)
- Entire wetland is in the Flats class — points = 5

→ 3

Total for D 4	Add the points in the boxes above	10

Rating of Site Potential If score is: ___**12-16 = H** (10) **6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = (0)	Ø
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = (0)	Ø
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = (0)	Ø
Total for D 5	Add the points in the boxes above	Ø

Rating of Landscape Potential If score is: ___**3 = H** ___**1 or 2 = M** (Ø) **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*

The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):

- Flooding occurs in a sub-basin that is immediately down-gradient of unit. — points = (2)
- Surface flooding problems are in a sub-basin farther down-gradient. — points = 1

Flooding from groundwater is an issue in the sub-basin. — points = 1 ?

The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ — points = 0

There are no problems with flooding downstream of the wetland. — points = 0

→ 2

D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = (0) → Ø

Total for D 6	Add the points in the boxes above	2

Rating of Value If score is: (2) **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number JA1

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

___ Aquatic bed	4 structures or more: points = 4
_X_ Emergent	3 structures: points = 2
___ Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1
___ Forested (areas where trees have > 30% cover)	1 structure: points = 0

If the unit has a Forested class, check if:

___ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

Ø

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

___ Permanently flooded or inundated	4 or more types present: points = 3
___ Seasonally flooded or inundated	3 types present: points = 2
_X_ Occasionally flooded or inundated	2 types present: points = 1
_X_ Saturated only	1 type present: points = 0
___ Permanently flowing stream or river in, or adjacent to, the wetland	
___ Seasonally flowing stream in, or adjacent to, the wetland	
___ **Lake Fringe wetland**	**2 points**
___ **Freshwater tidal wetland**	**2 points**

1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

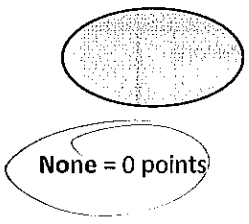
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted: > 19 species	points = 2
5 - 19 species	points = 1
< 5 species	points = 0

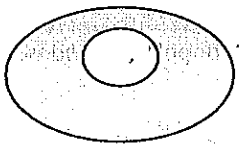
1

H 1.4. Interspersion of habitats

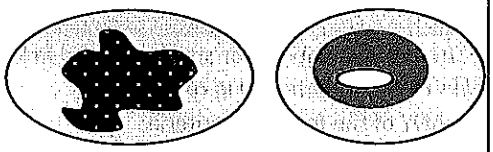
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



None = 0 points

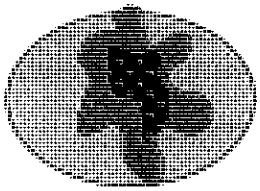


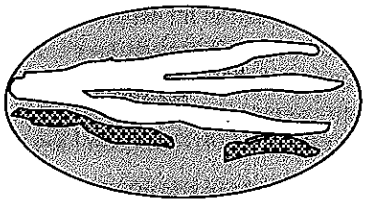
Low = 1 point



Moderate = 2 points

All three diagrams in this row are **HIGH** = 3points





Ø

Wetland name or number A1

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ____Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ____Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* __X__Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	1
Total for H 1 — Add the points in the boxes above	3

Rating of Site Potential If score is: ___**15-18 = H** ___**7-14 = M** __3__**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 0 + [(% moderate and low intensity land uses)/2] 37 = 37 % ~75 If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon — points = (3) 20-33% of 1 km Polygon — points = 2 10-19% of 1 km Polygon — points = 1 < 10% of 1 km Polygon — points = 0	3
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 50 + [(% moderate and low intensity land uses)/2] 20 = 70 % 40 Undisturbed habitat > 50% of Polygon — points = (3) Undisturbed habitat 10-50% and in 1-3 patches — points = 2 Undisturbed habitat 10-50% and > 3 patches — points = 1 Undisturbed habitat < 10% of 1 km Polygon — points = 0	3
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use — points = (-2) ≤ 50% of 1 km Polygon is high intensity — points = (0)	0
Total for H 2 — Add the points in the boxes above	6

Rating of Landscape Potential If score is: 6 **4-6 = H** ___**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Riparian ✓ Site meets ANY of the following criteria: — points = (2) Nearshore ✓ Snags/Logs ✓ __X__ It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m — points = 1 Site does not meet any of the criteria above — points = 0	2

Rating of Value If score is: 2 **2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number JA2

RATING SUMMARY – Western Washington

Name of wetland (or ID #): JA2 Date of site visit: 4 Dec 2014

Rated by J. Holm, J. McMillan Trained by Ecology? __ Yes X No Date of training ____

HGM Class used for rating Depression/Flats Wetland has multiple HGM classes? ___Y X N

NOTE: Form is not complete without the figures requested *(figures can be combined).*

Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY III (based on functions X or special characteristics ___)

1. Category of wetland based on FUNCTIONS

___ **Category I** – Total score = 23 - 27

___ **Category II** – Total score = 20 - 22

X **Category III** – Total score = 16 - 19

___ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	H M (L)	
Landscape Potential	H M (L)	H M (L)	(H) M L	
Value	(H) M L	(H) M L	(H) M L	TOTAL
Score Based on Ratings	6	6	7	19

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	

Wetland name or number JA2

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet *(can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R S.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number A2

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = (3) Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*. Yes = 4 No = (0)	Ø
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = (5) Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = (0)	Ø
Total for D 1 Add the points in the boxes above	8

Rating of Site Potential If score is: ___ **12-16 = H** (8) **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ___ **1 or 2 = M** (0) **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = (0)	0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = (1) No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality *(answer YES if there is a TMDL for the basin in which the unit is found)*? Yes = (2) No = 0	2
Total for D 3 Add the points in the boxes above	3

Rating of Value If score is: (3) **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number JA2

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland:

Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = (4)	4
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	

D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*

Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
The wetland is a "headwater" wetland	points = (3)	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = 0	

D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*

The area of the basin is less than 10 times the area of the unit	points = 5	3
The area of the basin is 10 to 100 times the area of the unit	points = (3)	
The area of the basin is more than 100 times the area of the unit	points = 0	
Entire wetland is in the Flats class	points = 5	

Total for D 4	Add the points in the boxes above	10

Rating of Site Potential If score is: ___**12-16 = H** (10) **6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = 0	Ø
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = 0	Ø
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = 0	Ø
Total for D 5	Add the points in the boxes above	Ø

Rating of Landscape Potential If score is: ___**3 = H** ___**1 or 2 = M** (Ø) **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*

The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):		2
• Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = (2)	
• Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
Flooding from groundwater is an issue in the sub-basin.	points = 1	
The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____	points = 0	
There are no problems with flooding downstream of the wetland.	points = 0	

D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0 — Ø

Total for D 6	Add the points in the boxes above	2

Rating of Value If score is: (2) **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number JA2

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

____Aquatic bed	4 structures or more: points = 4
_X_Emergent	3 structures: points = 2
____Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1
____Forested (areas where trees have > 30% cover)	1 structure: points = 0

If the unit has a Forested class, check if:

____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

Ø

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

____Permanently flooded or inundated	4 or more types present: points = 3
____Seasonally flooded or inundated	3 types present: points = 2
____Occasionally flooded or inundated	2 types present: points = 1
_X_Saturated only	1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland	
____Seasonally flowing stream in, or adjacent to, the wetland	
____**Lake Fringe wetland**	**2 points**
____**Freshwater tidal wetland**	**2 points**

Ø

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

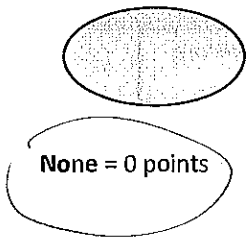
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted: > 19 species	points = 2
5 - 19 species	points = 1
< 5 species	points = 0

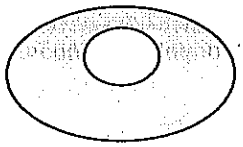
1

H 1.4. Interspersion of habitats

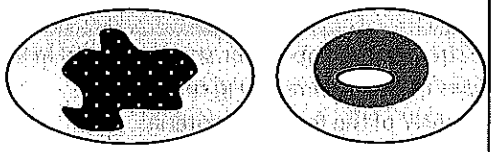
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



None = 0 points

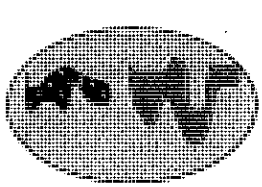


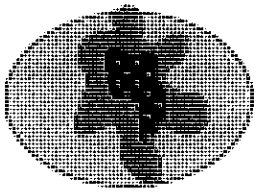
Low = 1 point

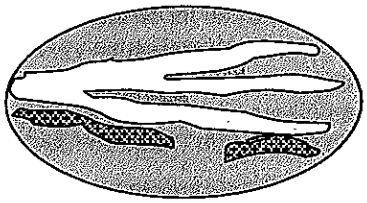


Moderate = 2 points

All three diagrams in this row are **HIGH** = 3points







Ø

Wetland name or number JA2

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ____Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ____Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ____At least ⅓ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* __X__Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	1
Total for H 1 — Add the points in the boxes above	2

Rating of Site Potential If score is: ___**15-18 = H** ___**7-14 = M** __2__**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 10 + [(% moderate and low intensity land uses)/2] 30 = 40 % If total accessible habitat is: ~60 > 1/3 (33.3%) of 1 km Polygon — points = (3) 20-33% of 1 km Polygon — points = 2 10-19% of 1 km Polygon — points = 1 < 10% of 1 km Polygon — points = 0	3
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 50 + [(% moderate and low intensity land uses)/2] 20 = 70 % 40 Undisturbed habitat > 50% of Polygon — points = (3) Undisturbed habitat 10-50% and in 1-3 patches — points = 2 Undisturbed habitat 10-50% and > 3 patches — points = 1 Undisturbed habitat < 10% of 1 km Polygon — points = 0	3
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use — points = (- 2) ≤ 50% of 1 km Polygon is high intensity — points = (0)	0
Total for H 2 — Add the points in the boxes above	6

Rating of Landscape Potential If score is: __4-6 = H** ___**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: Riparian, Nardone, Suggs & logs — points = (2) __X__ It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m — points = 1 Site does not meet any of the criteria above — points = 0	2

Rating of Value If score is: (2)**2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number JA4

RATING SUMMARY – Western Washington

Name of wetland (or ID #): JA4 Date of site visit: 4Dec2014

Rated by J. Holm, J. McMillan Trained by Ecology? __ Yes X No Date of training ____

HGM Class used for rating Depression/Flats Wetland has multiple HGM classes? ___Y X N

NOTE: Form is not complete without the figures requested *(figures can be combined).*

Source of base aerial photo/map ____

OVERALL WETLAND CATEGORY III (based on functions X or special characteristics ___)

1. Category of wetland based on FUNCTIONS

___ **Category I** – Total score = 23 - 27

___ **Category II** – Total score = 20 - 22

X **Category III** – Total score = 16 - 19

___ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H M (L)	H M (L)	
Landscape Potential	H M (L)	H M (L)	(H) M L	
Value	(H) M L	(H) M L	(H) M L	TOTAL
Score Based on Ratings	6	5	7	18

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	

Wetland name or number JA4

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet *(can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number JA4

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = (3) Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*. Yes = 4 No = (0)	Ø
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = (5) Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = (0)	Ø
Total for D 1 — Add the points in the boxes above	8

Rating of Site Potential If score is: ___ **12-16 = H** (8) **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = (0)	Ø
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = (0)	Ø
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = (0)	Ø
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ Yes = 1 No = (0)	Ø
Total for D 2 — Add the points in the boxes above	Ø

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ___ **1 or 2 = M** (Ø) **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = (0)	Ø
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = (1) No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality *(answer YES if there is a TMDL for the basin in which the unit is found)*? Yes = (2) No = 0	2
Total for D 3 — Add the points in the boxes above	3

Rating of Value If score is: (3) **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number SA4

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland:

Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = (4)	4
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	

D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*

Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	Ø
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = (0)	

D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*

The area of the basin is less than 10 times the area of the unit	points = 5	Ø
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = (0)	
Entire wetland is in the Flats class	points = 5	

Total for D 4	Add the points in the boxes above	4

Rating of Site Potential If score is: ___12-16 = H ___6-11 = M (4) 0-5 = L *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = (0)	Ø
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = (0)	Ø
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = (0)	Ø
Total for D 5	Add the points in the boxes above	Ø

Rating of Landscape Potential If score is: ___3 = H ___1 or 2 = M (Ø) 0 = L *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*

The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):		2
• Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = (2)	
• Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
Flooding from groundwater is an issue in the sub-basin.	points = 1	
The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____	points = 0	
There are no problems with flooding downstream of the wetland.	points = 0	

D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	Yes = 2 No = (0)	Ø
Total for D 6	Add the points in the boxes above	2

Rating of Value If score is: (2) 2-4 = H ___1 = M ___0 = L *Record the rating on the first page*

Wetland name or number JA4

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

____Aquatic bed
__X__Emergent
____Scrub-shrub (areas where shrubs have > 30% cover)
____Forested (areas where trees have > 30% cover)

4 structures or more: points = 4
3 structures: points = 2
2 structures: points = 1
1 structure: points = 0

If the unit has a Forested class, check if:

____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

____Permanently flooded or inundated
____Seasonally flooded or inundated
____Occasionally flooded or inundated
__X__Saturated only
____Permanently flowing stream or river in, or adjacent to, the wetland
____Seasonally flowing stream in, or adjacent to, the wetland
____**Lake Fringe wetland**
____**Freshwater tidal wetland**

4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 type present: points = 0

2 points
2 points

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

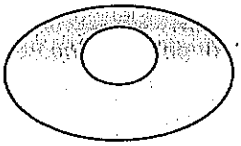
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted: > 19 species — points = 2
5 - 19 species — points = 1
< 5 species — points = 0

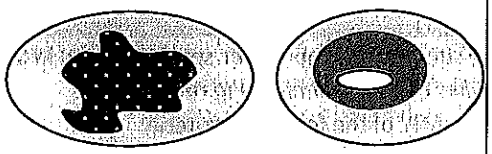
H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*

None = 0 points

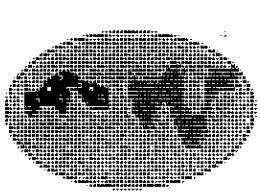


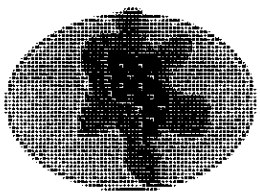
Low = 1 point

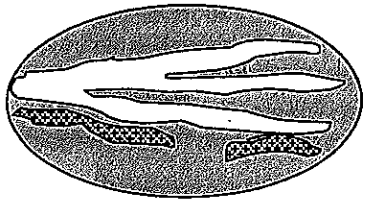


Moderate = 2 points

All three diagrams in this row are **HIGH** = 3points







Wetland name or number ____

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ____Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ____Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* X Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	1
Total for H 1 — Add the points in the boxes above	1

Rating of Site Potential If score is: ___**15-18 = H** ___**7-14 = M** 1 **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?

H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat Ø + [(% moderate and low intensity land uses)/2] 25 = 25 % ~50 If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1 km Polygon — points = (2) 10-19% of 1 km Polygon — points = 1 < 10% of 1 km Polygon — points = 0	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 50 + [(% moderate and low intensity land uses)/2] 20 = 70 % 40 Undisturbed habitat > 50% of Polygon — points = (3) Undisturbed habitat 10-50% and in 1-3 patches — points = 2 Undisturbed habitat 10-50% and > 3 patches — points = 1 Undisturbed habitat < 10% of 1 km Polygon — points = 0	3
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use — points = (- 2) ≤ 50% of 1 km Polygon is high intensity — points = (0)	Ø
Total for H 2 — Add the points in the boxes above	5

Rating of Landscape Potential If score is: 5 **4-6 = H** ___**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?

H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: — points = (2) Riparian ✓ nearshore ✓ snags/logs ✓ — It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m — points = 1 Site does not meet any of the criteria above — points = 0	2

Rating of Value If score is: 2 **2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number JA5

RATING SUMMARY – Western Washington

Name of wetland (or ID #): JA5 Date of site visit: 15Dec2014

Rated by J. Holm, J. McMillan Trained by Ecology? __ Yes X No Date of training ____

HGM Class used for rating Depressional/Flats Wetland has multiple HGM classes? __ Y X N

NOTE: Form is not complete without the figures requested *(figures can be combined).*

Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY III (based on functions X or special characteristics ___)

1. Category of wetland based on FUNCTIONS

___ **Category I** – Total score = 23 - 27

___ **Category II** – Total score = 20 - 22

X **Category III** – Total score = 16 - 19

___ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M L	H M (L)	H M (L)	
Landscape Potential	H M (L)	H M (L)	(H) M L	
Value	(H) M L	(H) M L	(H) M L	TOTAL
Score Based on Ratings	7	5	7	19

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	

Wetland name or number JAS

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number JA5

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?

D 1.1. Characteristics of surface water outflows from the wetland:		
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).	points = (3)	3
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.	points = 2	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 1	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 1	
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*.	Yes = 4 No = (0)	Ø
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):		
Wetland has persistent, ungrazed, plants > 95% of area	points = (5)	5
Wetland has persistent, ungrazed, plants > ½ of area	points = 3	
Wetland has persistent, ungrazed plants > 1/10 of area	points = 1	
Wetland has persistent, ungrazed plants < 1/10 of area	points = 0	
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.*		
Area seasonally ponded is > ½ total area of wetland	points = 4	Ø
Area seasonally ponded is > ¼ total area of wetland	points = 2	
Area seasonally ponded is < ¼ total area of wetland	points = (0)	
Total for D 1	Add the points in the boxes above	8

Rating of Site Potential If score is: ___ **12-16 = H** (8) **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?

D 2.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = (0)	Ø
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = (0)	Ø
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1 No = (0)	Ø
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____	Yes = 1 No = (0)	Ø
Total for D 2	Add the points in the boxes above	Ø

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ___ **1 or 2 = M** (Ø) **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?

D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?	Yes = 1 No = 0	Ø
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?	(Yes = 1) No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)?	Yes = (2) No = 0	2
Total for D 3	Add the points in the boxes above	3

Rating of Value If score is: (3) **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number JA5

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland:

Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = (4)	4
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	

D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*

Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	Ø
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = (0)	

D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*

The area of the basin is less than 10 times the area of the unit	points = 5	Ø
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = (0)	
Entire wetland is in the Flats class	points = 5	

Total for D 4	Add the points in the boxes above	4

Rating of Site Potential If score is: ___**12-16 = H** ___**6-11 = M** (4) **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = (0)	Ø
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = (0)	Ø
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = (0)	Ø
Total for D 5	Add the points in the boxes above	Ø

Rating of Landscape Potential If score is: ___**3 = H** ___**1 or 2 = M** (Ø) **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*

The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):		2
• Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = (2)	
• Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
Flooding from groundwater is an issue in the sub-basin.	points = 1	
The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____	points = 0	
There are no problems with flooding downstream of the wetland.	points = 0	

D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	Yes = 2 No = (0)	Ø
Total for D 6	Add the points in the boxes above	2

Rating of Value If score is: (2) **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number JA5

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

____Aquatic bed	4 structures or more: points = 4
____Emergent	3 structures: points = 2
____Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1
____Forested (areas where trees have > 30% cover)	1 structure: points = 0

If the unit has a Forested class, check if:

____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

____Permanently flooded or inundated	4 or more types present: points = 3
____Seasonally flooded or inundated	3 types present: points = 2
____Occasionally flooded or inundated	2 types present: points = 1
_X_ Saturated only	1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland	
____Seasonally flowing stream in, or adjacent to, the wetland	
____**Lake Fringe wetland**	**2 points**
____**Freshwater tidal wetland**	**2 points**

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

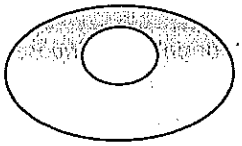
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted: > 19 species	points = 2
5 - 19 species	points = 1
< 5 species	points = 0

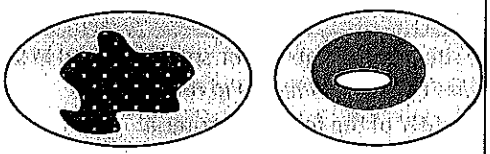
H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*

None = 0 points

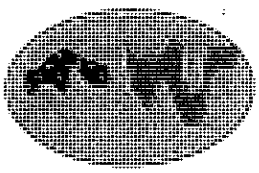


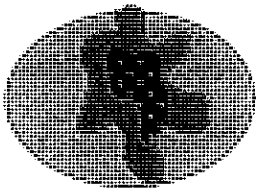
Low = 1 point

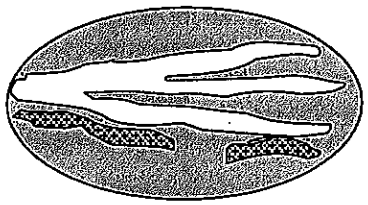


Moderate = 2 points

All three diagrams in this row are **HIGH** = 3points







Wetland name or number JA5

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ____Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ____Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* X Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	1
Total for H 1 — Add the points in the boxes above	1

Rating of Site Potential If score is: ___15-18 = H ___7-14 = M 1 0-6 = L *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?

H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 75 + [(% moderate and low intensity land uses)/2] 12 = 87 % ~25 If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon — points = (3) 20-33% of 1 km Polygon — points = 2 10-19% of 1 km Polygon — points = 1 < 10% of 1 km Polygon — points = 0	3
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 50 + [(% moderate and low intensity land uses)/2] 20 = 70 % 40 Undisturbed habitat > 50% of Polygon — points = (3) Undisturbed habitat 10-50% and in 1-3 patches — points = 2 Undisturbed habitat 10-50% and > 3 patches — points = 1 Undisturbed habitat < 10% of 1 km Polygon — points = 0	3
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use — points = (-2) ≤ 50% of 1 km Polygon is high intensity — (points = 0)	0
Total for H 2 — Add the points in the boxes above	6

Rating of Landscape Potential If score is: 6 4-6 = H ___1-3 = M ___< 1 = L *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?

H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Riparian nearshore ✓ Site meets ANY of the following criteria: — points = (2) X It has 3 or more priority habitats within 100 m (see next page) Snags/logs ✓ — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m — points = 1 Site does not meet any of the criteria above — points = 0	2

Rating of Value If score is: 2 2 = H ___1 = M ___0 = L *Record the rating on the first page*

Wetland name or number JA6

RATING SUMMARY – Western Washington

Name of wetland (or ID #): JA6 Date of site visit: 4Dec2014

Rated by J.Holm, J. McMillan Trained by Ecology?__ Yes X No Date of training_____

HGM Class used for rating_____ Wetland has multiple HGM classes?___Y ____N

NOTE: Form is not complete without the figures requested *(figures can be combined).*

Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY I (based on functions___ or special characteristics X)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
	Circle the appropriate ratings									
Site Potential	H	M	L	H	M	L	H	M	L	
Landscape Potential	H	M	L	H	M	L	H	M	L	
Value	H	M	L	H	M	L	H	M	L	TOTAL
Score Based on Ratings										

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I** II
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** II
Interdunal	**I** II III IV
None of the above	

Wetland name or number JA 6

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number JAC

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ___The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   ___The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES** – The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number JA6

NO – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number SAG

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	Category
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? √ The dominant water regime is tidal, √ Vegetated, and √ With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Cape Disappointment St. Park Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 2.2** No – Go to **SC 2.3** 5C 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes – **Contact WNHP/WDNR and go to SC 2.4** No = **Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No = **Is not a bog**	**Cat. I**

Wetland name or number JA 6

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and 5R 109 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

JARPA Appendix L
Mouth of the Columbia River Jetty A Repair Mitigation and Monitoring Plan

For
Rehabilitation of Jetty A
Near the Mouth of the Columbia River, Pacific County, Washington

Submitted by the U.S. Army Corps of Engineers, Portland District, Civil Works

April 2015

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Mouth of the Columbia River Jetty A Repair

Mitigation and Monitoring Plan

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Contents

1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Portland District, has proposed major rehabilitation and repair of Jetty A, which along with the North and South Jetties, is part of the USACE mouth of the Columbia River (MCR) navigation project. Jetty A is located near Cape Disappointment State Park, on the Long Beach Peninsula, in Pacific County, WA. The jetty is on USACE-owned property that is leased to the U.S. Coast Guard (USCG) for operations of its facility. The jetty is a rubble-mound structure constructed on an existing tidal shoal with a crest elevation ranging from 20-24 ft North American Vertical Datum of 1988 (NAVD88) and a crest width ranging from 10 to 40 ft. It helps to stabilize the navigational channel, reduce the need for dredging, and provide protection for vessels (USACE 2012). Portions of the jetty system have substantially degraded since its construction in 1939, and damage has increased in recent years because of increased storm activity and ongoing loss of sand shoal material upon which the jetties are constructed. Various repairs have been performed over the years to restore the height and width of the crest. Originally 1.1 miles in length, the length of the jetty has been reduced by approximately 900 ft since its construction, and without action is expected to continue to deteriorate at a rate of 5 to 20 ft/yr (USACE 2012). The proposed rehabilitation project is of critical importance to maintaining the Federal Navigation Channel at the MCR and assuring continued passage of marine traffic.

Summary tidal information for the project site is provided below based on data from the National Oceanic and Atmospheric Administration's (NOAA) National Ocean Service for the MCR North Jetty tidal gage station (Station 9440574), near Cape Disappointment, WA. This tidal station captures water levels characteristic of the open coast conditions of the MCR. For this project, relevant elevations are listed below:

MEAN LOWER LOW WATER, MLLW = -0.25 foot NAVD88
MEAN HIGHER HIGH WATER, MHHW = 7.5 feet NAVD88
MEAN HIGH WATER, MHW = 6.9 feet NAVD88
MEAN TIDE LEVEL, MTL = 3.9 feet NAVD88
MEAN SEA LEVEL, MSL = 3.8 feet NAVD88
MEAN LOW WATER, MLW = 1.0 feet NAVD88

During a December 2014 site visit, the USACE determined the lateral extent of navigable waters under the Clean Water Act using field indicators, such as scour marks and presence of litter, debris, and driftwood. On the east (estuary) side of the jetty, an elevation of 11.2 feet North American Vertical Datum of 1988 (NAVD88) is used to define the river's jurisdictional boundary. On the west (ocean) side, increased wave heights result in a higher jurisdictional boundary; the MHHT line corresponds to the 14.0-foot elevation contour (Holm, 2015).

2 PROJECT DESCRIPTION

The rehabilitation activities at Jetty A include construction access improvements, the creation of staging areas, delivery of construction materials, construction of the jetty, and possible dredging and construction of a temporary barge off-loading facility. The general location of the project is shown in Figure 1. Access improvements include reconstruction of a construction access pathway along the eastern, leeward side of the existing jetty. The maximum potential footprint of the design and construction implementation have been identified, though there remains uncertainty in the exact execution method until after the contract is awarded and specific construction methods are determined. Therefore, the Corps has identified and included project design parameters and constraints in order to sufficiently assess and estimate the maximum environmental footprint and its effects. For the purposes of assessing habitat mitigation needs, this memorandum is focused on impacts to the estuarine side of the jetty that would result from construction of the access road and barge offloading facility. A separate Bank Use Plan has been prepared to address compensatory mitigation requirements for unavoidable impacts to existing wetlands at the landward root of the jetty.

Vehicle turnouts would be placed along the barge access pathway at approximately 500-foot intervals to allow construction equipment to pass without excessively increasing the width of the pathway. Each turnout would be approximately 20 feet wide by 90 feet long. To create a material staging and construction laydown area, approximately 7.6 acres of land between the jetty and the Cape Disappointment U.S. Coast Guard (USCG) facility would be leveled, cleared of vegetation, and resurfaced for material stockpiling and construction laydown. Construction materials would be delivered either by barge or by truck (or both). Several barge access alternatives for delivery of the fill materials have been analyzed. Of these, only one is within, or close to, the project's environmental constraints, as laid out by the EA. The most likely barge delivery alternative would require construction of a material offloading facility (MOF) in addition to construction of the access pathway. The MOF would include temporary piles and dredging to create adequate bottom clearance for fully loaded barges. Maintenance dredging may be required for one additional year, depending on the length of the construction project, and the MOF would be removed within 2 years of the time of construction. The final design of the facility will be at the discretion of the contractor, and the Corps will provide constraints related to dredging and fill footprints, number and size of piles, facility location, and finish depth. Disposal of dredged material would likely be placed as flow-lane disposal into outgoing currents at the mouth of the river, or at a previously approved dredge disposal site. Construction access for a conceptual MOF would likely require a maximum volume of approximately 60,000 cubic yards (cy) of dredge volume be removed to a finish depth of -25.6 NAVD 88 from a maximum area of approximately 1.7 acre (74,052 ft^2). In order to construct the barge platform, an area of fill will not exceed 1.2 acres, and up to 29,640 cy of fill placed to construct and stabilize the MOF. In order to construct the causeway access to the offloading facility, a maximum volume of 38,888 cy of volume may be placed over a 1.3 acres maximum fill footprint. Approximately 15,000 cy of driftwood, which has accumulated along the trunk of the jetty, would be

removed as part of the project. This driftwood will be used beneath the construction access road as base fill and as incorporated inwater habitat features for utilization by aquatic species.

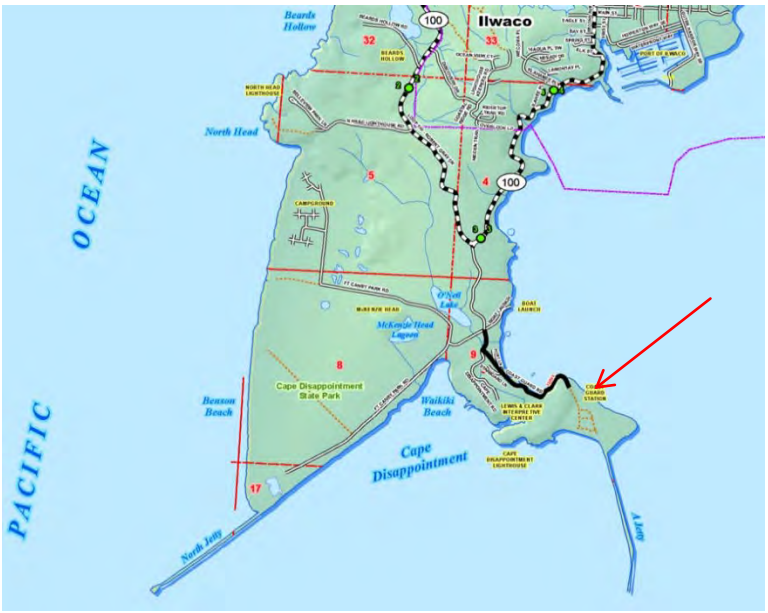

Figure 1. Jetty A location map. Red arrow indicates general location of proposed construction staging area.

The design template for scheduled trunk repairs for Jetty A includes a 30-foot crest width, 24-foot Mean Lower Low Water (MLLW) crest elevation, between 1V:2H and 1V:1.5H ocean/downstream side slope, and 1V:1.5H upstream side slope. Root and trunk repairs for Jetty A would extend from approximately stations 46+50 to approximate 87+50 and would lie within the existing jetty footprint based on the configuration of the original cross section, previous repair cross sections, and redistribution of jetty rock by wave action. Repairs of the jetty head section would extend from around stations 87+50 to 89+00. Currently, scheduled repairs along the trunk and head would entail up to a total maximum of about 82,000 tons (~50,800 cy). Reworked relic stone would account for a little more than 25 percent of the new tonnage placed, about 12,560 tons. Most of the work would occur above MLLW. Originally, the EA, Biological Assessment, and consultation anticipated a higher volume of stone and a larger design template, which has been refined based on more detailed design information.

3 EXISTING SITE CONDITIONS

Aquatic habitat in the vicinity of Jetty A consists primarily of shallow-water habitat (defined for this project as water that is between -20 feet to -23 feet below MLLW (NMFS 2011), some of which is intertidal sand-flat that is periodically exposed. The dominant substrate consists of relic jetty rock

lying atop shifting medium- to fine-grained sand. There is little habitat heterogeneity because of the dynamic current, wind, and wave conditions. Large volumes of driftwood that accumulate on the jetty are transitory within the jetty area. Little terrestrial vegetation grows on the jetty.

The wetland rating system for western Washington (Hruby 2004; 2014) provides a systematic approach for assessing water quality, hydrologic, or habitat functions in wetlands; however, no guidance currently exists for evaluating the functional capacity of non-wetland waters of the United States. For planning purposes, the same general approach used in the rating system for freshwater wetlands can be applied by considering similar factors to estimate ecological functions and values of the in-water habitat proposed for impact by jetty rehabilitation. For this project, the following factors were evaluated:

Water Quality Support – The jetty area supports no vegetation that would trap sediment, retain excess nutrients, filter pollutants, or help regulate water temperature.

Aquatic Habitat Support – The in-water habitat adjacent to Jetty A may provide refuge to aquatic species from periods of rough seas or high river flows. The area may provide foraging habitat for piscivorous species, but offers limited support for benthic feeders. The area may also provide limited rearing habitat for coastal pelagic and estuarine species. There is no identified spawning that occurs in the habitat surrounding Jetty A. Current Washington Department of Fish and Wildlife survey data indicate Jetty A is not used as a marine mammal haul-out (WDFW 2014).

Local Significance – Shallow-water habitat is not limited in the vicinity of Jetty A. Approximately 19,575 acres of shallow-water habitat exist in the vicinity of the MCR project. Generally, shallow-water habitat in the MCR is concentrated around the jetty structures and in adjacent coves and bays (NMFS 2011). Based on these characteristics, the in-water jetty area provides low levels of water quality and aquatic habitat support functions that would contribute to ecological values in the project area or in the basin.

4 WATERS IMPACTS

The project design for rehabilitation of Jetty A has been developed and refined to take advantage of opportunities to avoid and minimize, to the maximum extent practicable, the project's ecological impacts to aquatic habitats, pursuant to impact avoidance and minimization requirements under the Clean Water Act and Executive Order No. 11990. Efforts were made to reduce the project footprint to the extent practicable, while still achieving the project purpose and need. However, in-water work impacts are unavoidable as fill is required for jetty repair, and dredging may be necessary to create an appropriately sized mooring basin for material delivery.

Depending on the selected implementation method (exclusively overland rock delivery vs. rock delivery by water), the size of the inwater footprint could vary significantly. The Corps is providing a proposal that addresses the maximum potential inwater footprint based on maximum fill and removal footprints below the jurisdictional waters mark for the most impactful implementation method. Once the Corps awards a contract, the area requiring mitigation may be smaller than that described here. The Corps is proposing commensurate mitigation determined in part by the size of the footprint required for project completion. The proposed mitigation approach was vetted through the Adaptive Management Team (AMT). The AMT is comprised of various resource agencies such as Washington Department of Ecology (WDOE), Washington Department of Fish and Wildlife (WDFW), National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS).

The EA (USACE 2012) estimates that the Jetty A project would result in up to 6.62 acres of in-water work. This includes up to 2.89 acres for the MOF and construction access pathway and up to 3.73 acres of dredging. However, based on current impact estimates and a review of the likely construction access alternatives, the in-water work area would be greatly reduced. Recent calculations indicate that jetty repairs and construction access would likely result in a maximum footprint of approximately 4.2 acres (2.5 acres fill and 1.7 acres dredging) below the jurisdictional boundary of the river, which has the potential to affect habitat conditions and species that are present along the estuarine shoreline side of the jetty. Based on a review of current design options, most of the fill would be placed above MHHW, with relatively little to be placed in the intertidal and shallow sub-tidal areas that can provide important functions for aquatic species.

The Corps will include the following constraints in its contracting language. Dredging for the off-loading barge facility is estimated to impact approximately 1.7 acres (74,052 ft^2). Fill acreages will not exceed 2.5 acres. Exact acreages would be determined after the final bid is accepted by the Corps, but for the purpose of mitigation option comparison, the maximum estimated footprint that the project needs to compensate for 4.2 acres of new dredging and fill in waters of the United States. Impact numbers used for mitigation calculations in this memorandum should be considered estimates and represent the maximum anticipated impact for in-water project work.

5 PROPOSED MITIGATION

5.1 Rationale

Using the proposed ratio of 0.25:1, it was originally estimated that the amount of eelgrass mitigation was 0.42 acres (AECOM 2015). However, under the maximum footprint scenario, the amount of eelgrass mitigation required could increase to up to 1.05 acres. Most seagrass mitigation and restoration plantings are relatively small scale (< 1 acre); a seagrass planting effort one acre in size would generally be considered a large planting project. Due to the level of uncertainty and risk

associated with establishment of an eelgrass bed one acre in size in the Lower Columbia River estuary, the Corps is proposing to plant a maximum of 0.5 acres of eelgrass (*Zostera marina*) as one component of the mitigation package, and to integrate woody debris into the length of the causeway to the maximum extent practicable as the second component of the compensatory mitigation package for unavoidable impacts to waters of the U.S.

Both eelgrass habitat establishment and large woody debris enhancement offer significant habitat benefits by providing valuable three-dimensional habitat structure for juvenile salmonids and other priority species and regional species of concern. However, these two mitigation components differ in terms of the timing of the benefits and services provided and in the level of uncertainty and associated risk. The incorporation of large woody debris has the advantages of providing habitat benefits beginning almost immediately following construction, with a high level of certainty and very low risk; whereas eelgrass plantings may require several years to achieve the target density with a higher level of uncertainty and associated risk. Therefore, these two mitigation components serve to complement each other well by providing habitat benefits that begin immediately and increase over time, as well as reducing the overall level of uncertainty and risk.

5.2 Compensatory Mitigation Goals and Objectives

Goal: Increase habitat complexity in Baker Bay in order to provide valuable three-dimensional habitat structure for priority species and regional species of concern.

Objectives:

1. Establish a maximum of 0.5 acres of new native eelgrass (*Zostera marina*) habitat that is commensurate with the acreage of footprint impacted and that is similar in density to nearby existing eelgrass beds.
2. Increase habitat complexity along the construction access pathway through the addition of large woody debris in order to enhance habitat characteristics for juvenile coastal pelagic and estuarine fishes and other marine and estuarine organisms.

5.3 Eelgrass Habitat Establishment

Given the relative functional benefit of seagrass establishment, an appropriate mitigation approach would need to recognize the large functional lift that seagrass beds provide to aquatic systems, relative to the functions affected by the Jetty A project. Although current eelgrass mitigation policy describes a 1.2:1 replacement ratio for mitigating impacts to existing eelgrass, no guidance currently exists for mitigating un-vegetated aquatic habitat impacts with seagrass establishment. The rationale justifying the seagrass planting approach was described to resource agencies involved with the Adaptive Management Team for the Jetty A project during a project webinar on January 15, 2015. Resource agency participants at the webinar voiced no disagreement with the proposed approach.

The transplant effort may use test plots; varying methods, timing, and transplant site conditions to develop data to plan and implement mitigation. The full details of the planting effort have not been finalized, but mitigation planting will be done in one or more of the areas previously identified as potential eelgrass habitat (Borde et al. 2008) (Fig. 3), and will be conducted using the best planting procedures and scientific guidance available at the time of planting. Additional details known to date follow in the pertinent sections.

5.4 Habitat Enhancement Using Large Woody Debris

Many coastal aquatic habitat restoration and enhancement projects focus on the establishment of tidal channel complexity. Much of this complexity is achieved by placing woody debris in mainstem and tributary channels. However, current understanding of woody debris as habitat structure is primarily from non-tidal streams and river studies. These studies have clearly documented that woody debris provides a critical component of creating quality juvenile salmon foraging habitat; it creates cover, produces beneficial hydrological changes, and increases prey resources (Cornu et al. 2008). A study in the Coos Bay estuary sought to evaluate key habitat recovery questions associated with woody debris in estuarine habitats by placing large woody debris in 29 locations throughout the South Slough and monitoring the results. The report found that the woody debris resulted in higher densities of juvenile salmonids, both moving in and out of the estuary, relative to control sites without woody debris. The results also indicate that the wood resulted in increased fish prey resources; benthic invertebrate populations were much higher at sites with woody debris. Results are noted as primarily qualitative and limited by the short duration of the study (2 years) following the placement of the woody debris.

Incorporation of large wood as a feature of the construction access pathway would enhance shallow water and intertidal habitat characteristics for a number of species utilizing habitat immediately adjacent to the jetty. Large wood could provide habitat for sub-tidal and intertidal species (e.g., barnacles, sea stars, anemones, mussels). Further, large wood could provide shelter habitat and protected forage grounds for juvenile coastal pelagic and estuarine fish species. Incorporating large wood into portions of the access pathway could also provide refugia habitat for out-migrating salmonid juveniles, reducing predation risk for this life stage of these species. Driftwood material is abundant and readily available at the project site and would need to be moved from the jetty to facilitate construction of the access pathway..

Integration of aquatic habitat improvement elements into the construction of the construction access road along the east side of the jetty could improve shallow water and intertidal habitats along portions of the access pathway that require fill which will contact water. Pieces of large driftwood would be keyed into the intertidal portions of the pathway, extending out from the river side of the jetty (see Figure 2). Large wood elements could be inserted periodically along the pathway length where low spots require fill, enhancing inwater habitat. Wood found on site would be evenly

distributed and incorporated into the causeway construction where fill below OHW is required so that wood is in contact with and below the ordinary high water line as much as feasible to maximize the duration of inundation. This option has the advantage of improving habitat in the immediate vicinity of where impacts would occur. Wood will not remain over the long-term as the causeway erodes due to natural wave and scour processes. Because of this, utilization of wood on the water ward side of the causeway could potentially be considered two-fold mitigation. It will break up the habitat providing complexity along the causeway while in place and it will create benefit as the causeway breaks apart over time (WDFW 2015).

For planning and estimating purposes, incorporating about 400 pieces of woody debris within about a 500-ft length in the intertidal zone below 11.2 ft is assumed to partially offset the functional losses at the project site, given the enhanced condition within the project area following construction. The exact acreage available for placement is unknown, as the contractor will need to determine the appropriate locations in which wood can be incorporated and fill added in order to achieve a stable access road foundation for passage of large construction equipment and jetty armor stone. The actual design may involve clumps of driftwood at larger intervals.

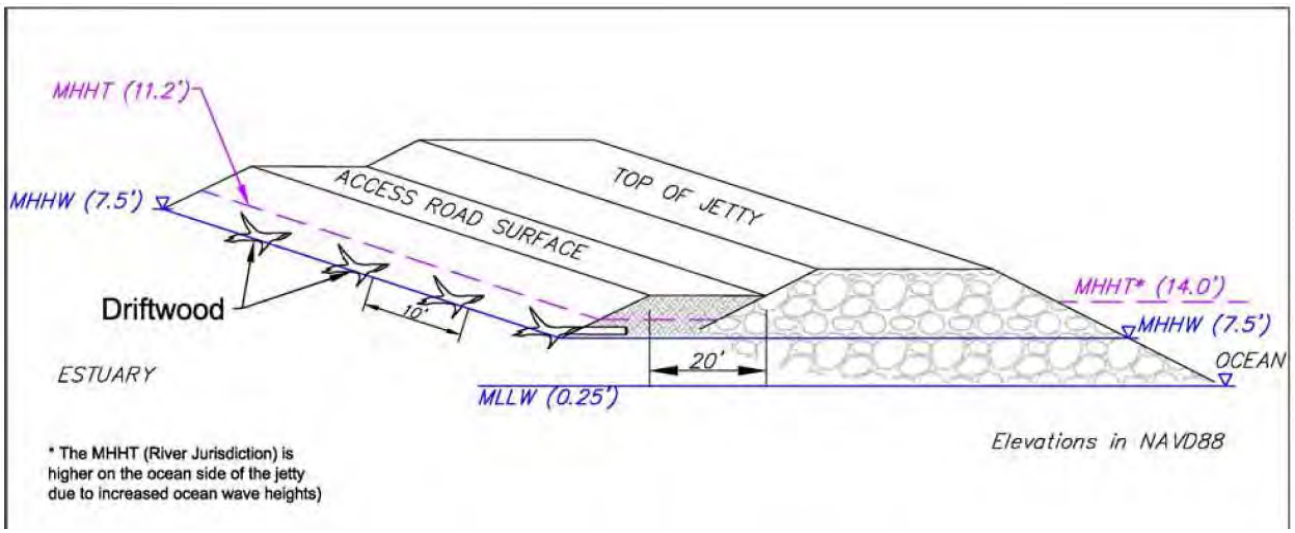

Figure 2. Conceptual representation of how wood will be incorporated into the causeway structure.

5.5 Eelgrass Mitigation Site Selection

The process for selecting a potential eelgrass transplant mitigation site includes an assessment of the site for depth, substrate, existing eelgrass, wave action, protection from human-caused disturbances and other physical and biological characteristics. Fortunately, much of this work has already been conducted for the Lower Columbia River estuary. In 2008, an eelgrass habitat suitability model for the lower Columbia River was developed (Judd et al. 2009). Factors in the model included light, depth, salinity, temperature, current velocity, wave energy, and anthropogenic disturbance. Light is

typically considered the most important factor affecting seagrass survival and distribution (Koch 2001). Based on this study, Baker Bay appears to be the most suitable area for eelgrass planting. Table 1 lists the approximate number of acres of known probable and potential eelgrass habitat classified by state (calculated from data provided by A. Borde; March 2015). In general, eelgrass needs a relatively protected marine or estuarine environment with some water movement to bring nutrients and prevent siltation. The sediment should be sandy or muddy sand, although eelgrass was found to tolerate a wider range of sediment sizes.

A previous report by Borde (2008) identified areas within Baker Bay that were thought to be most suitable for eelgrass restoration in 2008 (shown in the yellow polygons in Figure 3). Based on that report, four potential mitigation planting sites and three potential reference sites have been identified (Fig. 3). Hydroacoustic surveys of this area conducted will be conducted during the summer of 2015, and a series of test plots within the four potential mitigation planting areas shown in Fig 3 will be planted during the spring of 2016. The final location of the mitigation site(s) will be determined based on the results of test plots. Criteria for the selection of the mitigation planting sites will include sites that are not currently vegetated that are similar in depth and substrate to existing eelgrass beds. The planting sites may be near existing eelgrass beds, but should not be planted closer than 10m of existing beds in order to minimize disturbance.

Table 1. Total area of known, probable, and potential eelgrass habitat in Baker Bay in 2008 by state (Calculated from data provided by A. Borde).

Seagrass Status	OR (acres)	WA (acres)	*Total Seagrass Acres*
Known	0.00	8.42	*8.42*
Probable	3.53	47.90	*51.43*
Potential	91.15	91.14	*182.29*
Total Acres	*94.68*	*147.46*	*242.14*

Figure 3. Four potential eelgrass mitigation planting sites (P1-P4) and three potential reference areas (R1-R3) based on areas of known, probable, and potential eelgrass in Baker Bay as of 2008 (Figure created using data provided by A. Borde).

5.6 Eelgrass Mitigation Site Existing Conditions

Information about eelgrass distribution in the Columbia River estuary is limited. Although historical maps indicate the presence of submerged aquatic vegetation in the 1800's, until 2007 there were no maps of seagrass distribution in the area (Judd et al. 2009) . In 2007, there were only two known eelgrass meadows in the estuary, one located in Baker Bay (Figure 3), the other in Young's Bay (Borde 2008; Judd et al. 2009). Areas of known and potential eelgrass habitat in Baker Bay were mapped (Figure 3) and an extensive ground-truthing effort was conducted in Baker Bay September 24-26, 2007 (Borde 2008).

Due to the time lag since these surveys were conducted, it is necessary to update these maps with new surveys to determine the locations and extent of existing vegetation in the proposed mitigation area. It is generally necessary to conduct surveys in the summer (June 1 – October 1) when eelgrass biomass is at its greatest and can give the best estimates of actual population area and structure. Hydroacoustic surveys ground-truthed with underwater photography are currently planned for one week in June 2015 to map existing eelgrass habitat conditions within the areas identified as potential eelgrass habitat in Figure 3. The surveys will provide information on the site bathymetry,

presence/absence of underwater vegetation, the percent cover of the vegetation, and depth range of vegetation colonization. The surveys will also explore the possibility of using donor beds in Youngs Bay on the Oregon side of the river near Astoria.

5.7 Eelgrass Mitigation Design

Preliminary design and engineering documents to implement eelgrass habitat restoration will be prepared based on the conceptual design, existing information regarding the distribution of eelgrass in Baker Bay (Figure 3; Borde 2008), field data collection and analyses, and agency input. The final mitigation plan requires resolution of several issues regarding specific design, engineering, and construction issues. These issues include: establishing the most appropriate areas, elevations, sediments, techniques, and timing for habitat restoration to optimize eelgrass habitat in this area.

The final mitigation plan will consider a range of restoration options and issues, provide opportunities for consultation and review by state and federal resource and regulatory agencies, and address site-specific design and engineering needs. While details of the eelgrass mitigation planting are not fully developed, there are a number of decisions that have been made regarding site design and construction. These include:

1) Eelgrass habitat will be developed using sound science, planting methods and analyses that optimize conditions for eelgrass restoration.
2) The final mitigation plan will present the mechanisms and schedules for integrating the mitigation planting work with the Jetty A construction repair of the project in a manner that is advantageous to habitat development within the project area.
3) A maximum of 0.5 acres of eelgrass will be planted to satisfy the mitigation requirement.
4) The transplant effort may use test plots; varying methods, timing, and receiver site conditions to develop data to plan and implement mitigation.
5) The plan will address the long-term maintenance, monitoring and reporting requirements for the eelgrass sites.

5.8 Eelgrass Transplant Methods

5.8.1 Eelgrass Harvesting

Unlike emergent wetland plants and some freshwater submerged plant species, which are commercially propagated and often available in sufficient quantities for restoration, seagrasses and other estuarine submerged aquatic plants are generally not available as commercial nursery stock. This has been a limiting factor for many restoration projects, forcing a reliance on wild plants collected from donor sites. Typically, plants used in restoration are harvested from suitable donor beds, transported as rapidly as possible to the planting site, and transplanted as individual shoots, shoot bundles, or sods using a variety of methods.

Ideally the donor stock would be collected from existing eelgrass beds within Baker Bay, but if these beds are not of sufficient size to allow collection of the required number of plants without substantial impacts to the donor beds, then transplant stock could be also harvested from existing eelgrass beds in Youngs Bay (in Oregon). If necessary, Willapa Bay, WA could also be considered as a third alternative site for donor stock, although use of donor stock from either Baker Bay or Youngs Bay is preferred since these plants are adapted to local site conditions. Potential donor beds will be evaluated in the summer 2015 surveys.

Once the donor bed(s) have been identified, sufficient planting stock will be harvested to accomplish the required mitigation. Controls on harvesting allowable levels of donor material from native beds will be implemented to ensure no adverse impacts to donor beds. A good rule of thumb is to not remove more than 5-10% of the eelgrass shoots per unit area in the donor bed (Thom et al. 2008; Vavrinec et al. 2012).

The “bare-root method” is commonly used to collect plant material for eelgrass transplant projects. Divers gently remove substrate from around the rhizome and uproot the rhizome with roots and blades attached. This method results in viable transplant material with healthy internodal segments and well-formed root initiates. The bare-root plants will be transferred to a boat where biologists will separate and count the individual shoots. The blades of the eelgrass shoots will be trimmed to approximately 6 inches in length, both to facilitate easier handling of the shoots and the stimulate a growth response. Once trimmed, the shoots will be placed in totes or coolers full of seawater to prevent desiccation.

Once all of the shoots have been harvested, counted and trimmed, they will be processed into planting units (PU). Eelgrass PU typically consist of bundles of 3-6 bare-root plants (without sediments) secured in the sediment by an anchor of some sort to hold the plants in place until the roots and rhizomes have time to develop enough to stabilize the plants. Methods of anchoring bare-root PUs include using metal turf staples or washers to anchor the shoots, tying plants to landscape anchors, and tying mature shoots to solid frames with biodegradable cord and staking the frames in

the sediment (Fonseca et al. 1998, Short et al. 2002). The PUs will be placed in coolers of seawater and transported to the mitigation site.

Alternatively, establishment of an eelgrass aquaculture facility could be considered to supply eelgrass stocks for future planting and reduce the impacts to donor beds. Adult shoots would be harvested from donor beds and placed in some type of 'seagrass nursery' facility to increase the number of shoots available for transplant purposes. A land-based eelgrass nursery facility would require a series of large outdoor aquaculture tanks with a volume sufficient to contain the required number of eelgrass plants; the tanks would need to be supplied with recirculating seawater. Such a facility currently exists at the Pacific Northwest National Labs (PNNL) laboratory in Sequim, WA but the logistics of transporting the eelgrass plants from Sequim to the mitigation planting site may render this option impractical. Tanks could also be purchased and set up in a location near the proposed mitigation site if an appropriate seawater supply source is available, but the cost-effectiveness of this option would need to be evaluated. A third alternative would be to harvest donor plants and plant them in a suitable in-water "nursery area" where they could expand and produce additional plants for subsequent use as mitigation planting stock.

The Corps will include all of these options in its contract package along with appropriate constraints and criteria that ensures the contractor achieves successful plant establishment using whichever method is determined to be most viable.

5.8.2 Eelgrass Transplant Installation

Replicated transplant blocks will be distributed within and in the vicinity of the proposed planting areas within Baker Bay in a manner that allows for evaluation of the roles of various environmental factors such as depth, exposure, light, and timing of transplanting to the survival and growth of transplanted eelgrass. To minimize disturbance to existing eelgrass, eelgrass will not be transplanted within 10m of any existing eelgrass beds.

Based on surveys conducted in 2007-2008, the average depth of the eelgrass beds in Baker Bay was approximately -0.98 m MLLW $\pm$ 0.73 m ($\pm$ standard deviation). The estimated maximum depth at which there would be sufficient light for long-term eelgrass survival in Baker Bay, based on a requirement of 3 mol quanta/m^2/day, would be -1.165 m MLLW (Borde 2008).

To install each prepared planting unit, a diver will dig a shallow trough of sufficient size to bury the eelgrass rhizomes and roots (e.g. ~ 2-3 inches deep and 3-4 inches long). The planting unit is inserted into the trough with the shoots pointing upward, and the eelgrass rhizomes fitting into the trough. An anchor or staple is pushed into the trough such that the crown of the staple is flush with the sediment, and the eelgrass rhizomes are firmly seated in the substrate. Care must be taken to ensure that the eelgrass blades are free and not buried in sediment. The trough is then gently covered.

5.8.3 Eelgrass Density and Extent of Transplant

Seagrasses are typically planted at spacings ranging from 0.5 to 2m on center (Fonseca et al. 1998). The benefits of more rapid coverage at higher planting density are offset by the substantially higher costs. For example, a planting area roughly 1,700 sqm (42m by 42m) in size would need 450 plants, 1,800 or 7,100 plants as the planting density increases from 2m on center, to 1m to 0.5m. It is prudent to plant an area slightly larger than the size of the required mitigation area in order to increase the probability of success.

Comparison of test plots planted at varying densities and patch sizes, using different techniques to evaluate rates of bed development versus cost has been recommended to address uncertainty and increase project success (Thom et al. 2008). For this project, planting of the initial test plots will be implemented in such a way to include planting at various densities (ranging from 0.5 to 2m on center plant spacing), and varying patch sizes (1m, 3m, and 5m, for example). Different transplanting or anchoring methods could also be incorporated into the test plot planting design. The results of the test plots will be used to determine the optimum planting design for the final mitigation planting.

5.8.4 Transplant Timing

Previous studies of other eelgrass transplant projects on the Pacific coast have shown that planting unit size and the time of year when transplanting occurs can both be important in determining transplant unit survival. In general, the optimum time for transplanting would be early in the growing season (April-June) so that plants have a longer period of time to establish themselves.

5.8.5 Transplant Site Protection

Mitigation planting will be conducted in submerged lands that are owned by the Department of Natural Resources in WA. There is a chance that plants may be harvested from OR Department of State Lands submerged lands. A Memorandum of Agreement (MOA) will be developed between the US Army Corps and both OR and WA agencies in order to obtain a right-of-entry and afford site protection. Planting will not be conducted in areas that experience disturbance from dredging.

6.0 MONITORING PLAN

6.1 Overview

The Corps is not proposing monitoring of the large wood placed in the causeway access ramp. As noted, eventually natural forces will erode away the structure, and the wood movement will be re-activated in the system. The eelgrass mitigation project will include monitoring to provide data necessary to support habitat design needs and evaluate project success.

It is generally necessary to conduct eelgrass monitoring in the summer (June 1 – October 1) when biomass is at its greatest and can give the best estimates of actual population area and structure. Variables of the physical environment, including, temperature, salinity, depth and *possibly* photosynthetically active radiation (PAR) will also be collected as part of the monitoring program in order to understand the conditions contributing to the success or failure of the planting. Qualitative observations made throughout the year can also be helpful in explaining the condition of the eelgrass plots during summer quantitative surveys. For example, winter storm-driven waves can often move sediment and gravel onto eelgrass plots as well as erode eelgrass. However, the sediment sorting process that occurs between winter and summer tends to make physical conditions appear suitable and mask the severity of the winter disturbances on eelgrass.

6.2 Reference Site Selection

In order to help evaluate transplant success, reference sites of naturally existing eelgrass will be selected within Baker Bay. The reference sites should be similar to the mitigation sites in depth profile, substrate, exposure, turbidity, and disturbance regimes. Figure 3 shows the locations of three potential reference sites based on maps of known existing eelgrass beds in Baker Bay in 2008. Updated maps of existing eelgrass in this area will be provided based on the results of hydroacoustic surveys to be conducted in summer of 2015. These surveys will cover the areas identified as known, probable, and potential eelgrass as mapped by Borde et al. 2008, and shown in Figure 3. The results of these surveys will be used to confirm the existence of the proposed reference areas in Fig 3.

6.3 Performance Metrics

Performance metrics are specific quantitative or observable parameters used to evaluate whether or not the project goals are being met. The majority of the eelgrass restoration projects in the Pacific Northwest used shoot density as the principle performance metric, which was often compared against densities in reference plots (Thom et al. 2008). Shoot density is sampled by counting eelgrass shoots within a (minimum) 0.25 m^2 area quadrat. Samples can be larger than 0.25 m^2, but all samples need to reference the area from which they were taken so that the data can be converted to shoot densities (shoots/m^2).

Shoot density and percent survival in the initial test plots will be assessed at intervals of 3 months and 1 year post-planting. The mitigation planting will be conducted at those sites that exhibit the highest rates of planting survival after 1 year.

Shoot density in the mitigation planting and reference areas will be measured annually for a period of 5 years.

Final mitigation success or failure will be based on year-five survey results.

Performance Metric 1: Areal Coverage of Eelgrass. The mitigation planting may be at a single site or distributed among multiple sites, but the total planted acreage should be equal to the target acreage as specified in the final mitigation plan (up to a maximum of 0.50 acres).

Performance Metric 2: Eelgrass Shoot Density. Statistical tests will be used to compare mean eelgrass shoot density at the mitigation sites relative to the reference sites. (H0: mean eelgrass density at the mitigation sites ≥ mean eelgrass density at reference sites). (See Section 6.4 for discussion of statistical analysis procedures.)

Failure to meet prescribed areal coverage or eelgrass density (i.e., rejecting the null hypothesis) will require implementation of contingency actions identified in the adaptive management plan.

6.4 Statistical Analysis

Mitigation success is most often evaluated based on comparisons of eelgrass densities at a mitigation site versus a reference site. We suggest using a two-sample, one-tailed t-test for comparison of eelgrass mean densities from mitigation versus reference areas. The statistical null hypothesis in this case is - H0: mean eelgrass density at the mitigation sites ≥ mean eelgrass density at the reference sites. Quantitative surveys of eelgrass in transplant plots often involved use of random or stratified random sampling of quadrats (0.25 to 1.0 m^2) or set transects that are repeatedly examined and quantified over time (repeated measures).

Analysis of the performance metric data should include the following statistical considerations:

• Low probability of a Type I error - concluding there is difference between the mitigation sites and the reference sites when, in fact, there is not. This issue is addressed by selecting a small value for α in statistical analyses, usually 0.10.

• Low probability of a Type II error - failing to detect a difference between the mitigation sites and the reference sites when, in fact, there is one. Selecting a small value for β (applying high statistical power, $(1-\beta)$) ensures this. Power set at 0.90 provides low probability of a Type II error.

Statistical procedures will be used to determine the required number of samples, which will vary according to the size of the areas and the variability of the measured shoot density. Since seagrass shoot density naturally varies along the depth gradient, the data analysis should also recognize that there could be issues with comparing restoration sites to reference sites if the reference plots were at depths slightly different than the planted plots (Vavrinec et al. 2007).

6.5 Monitoring Schedule

Physical environmental variables including, temperature, salinity, depth and possibly photosynthetically active radiation (PAR) will be measured in each planting areas and reference area at the time of planting, and repeated at each subsequent monitoring event as described below.

The total areal coverage of eelgrass at the mitigation site(s) will be determined through mapping surveys.

Shoot density and/or percent survival in the initial test plots with concurrent measurement of the physical variables listed above will be assessed at intervals of 3 months and 1 year post-planting. This information is intended to assess the suitability of planting sites for long-term survival and growth of eelgrass.

Shoot density in the mitigation planting areas and the reference areas, with concurrent measurement of the physical variables listed above, will be measured annually for a period of 5 years. The year one sample of the mitigation planting is intended to assess initial survival of the eelgrass transplants. The year-two and three samples are designed to detect potential early failures in eelgrass growth at the mitigation site(s), relative to the reference site(s), that may suggest the need for additional actions at the mitigation sites (e.g., changing the planting location and/or additional transplants).

7.0 ADAPTIVE MANAGEMENT PLAN

Project managers have three adaptive management options to increase restoration success (Thom 1997, 2000):

1) No action - allow the site to develop naturally;

2) Take corrective action to change the restoration project. This requires a trigger (e.g. not meeting success criteria after a specified amount of time triggers replanting) based on the monitoring criteria and project goals; or

3) Change the goal or the performance metrics if it has been determined that the site may not ever be able to achieve its original goal(s). This option needs to have a sound scientific and statistically rigorous basis as well as feedback to the planning, implementation, and monitoring phases of the project.

For compensatory mitigation projects, the no action alternative when performance criteria are not met is often not viewed as an acceptable option.

Monitoring, evaluation and reporting of the test plots in the four proposed planting areas are expected to occur from June-Dec 2016.

The first stage of the adaptive management plan is to distribute the mitigation planting among those sites where the test plots exhibited the greatest survival and growth. The planting may be distributed among multiple sites, but the total planted acreage should be equal to or slightly exceeding the specific target acreage.

Sites that have obvious problems (e.g. zero survival) during the first year following planting should not be replanted in the same location.

If the total areal coverage is not at least 50% of the target acreage by the end of the Year 3 monitoring period, then replanting sufficient to achieve the target acreage will be conducted at those sites that exhibit the best survival and growth, taking care not to disturb existing vegetation.

If at any point during the 5 year monitoring period, the performance objectives for areal coverage and shoot density are met, then no further monitoring will be conducted.

If the performance metrics are not achieved by Year 5, the most appropriate corrective action will be developed based on careful evaluation and interpretation of the monitoring data. At this point, an understanding of the inherent reasons for not meeting performance criteria is essential in order to choose and implement a corrective measure that will yield positive results. The physical environmental data (e.g. salinity, temperature, depth, maybe PAR, etc.) will be important in understanding the factors affecting eelgrass survival. Corrective actions could include changing locations prior to replanting rather than just replanting.

8.0 IMPLEMENTATION SCHEDULE

Only general information on the implementation schedule is available as of the writing of this draft mitigation plan. Additional details will be provided in the final mitigation plan.

Eelgrass surveys in Baker Bay and Young's Bay are planned for the summer (June-September) of 2015. The objectives of these surveys are 1) to determine locations and extent of existing eelgrass beds in proposed mitigation areas in Baker Bay, 2) identify suitable donor beds for transplant stock, and 3) identify appropriate reference areas, and 4) survey the four areas proposed for test planting areas in Fig 3 to verify that these areas are currently unvegetated. The surveys will employ hydroacoustic seagrass detection algorithms (Biosonics, Inc) supplemented with underwater video for ground-truthing of hydroacoustic survey results.

Harvest of donor plants and installation of test plots are expected to occur during the timeframe of Apr-June of 2016.

Monitoring, evaluation and reporting of the test plots are expected to occur from June-Dec 2016

Harvest of donor plants and installation of mitigation plantings are expected to occur during the timeframe of Apr-June of 2017.

Monitoring of the mitigation plantings will occur annually beginning 1 year post-planting and continuing for a period of 5 years.

Reporting on the overall study findings is expected to extend to October 2022. A more detailed schedule of this activity will be developed in a separate document.

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