Revised Biological Evaluation

Makah Indian Tribe
Emergency Spill Response Dock Extension
Construction Project

Submitted to

U.S. Army Corps of Engineers
Seattle District
Seattle, Washington

On behalf of

Applicant:
Makah Indian Tribe
Neah Bay, Washington

September 2017

Submitted by

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A16.0096.00

REVISED BIOLOGICAL EVALUATION

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1.0 PURPOSE OF BIOLOGICAL EVALUATION

The Makah Indian Tribe (Tribe) is proposing to provide a permanent mooring location for the emergency response towing vessel (ERTV) and associated emergency and spill response vessels. These vessels are currently moored in the Makah Marina and provide critical response capability as included in the Washington State Department of Ecology's (Ecology) Geographical Response Plan (GRP) for the waters of Neah Bay and the Strait of Juan de Fuca. In order to continue to provide enhanced ability for rapid deployment of response resources to meet current and future ship traffic in the area, the Tribe wishes to construct an updated facility that can provide adequate and safe moorage to emergency response vessels in Neah Bay, Washington (Sheet 1). The project site is located in open water of Neah Bay and situated adjacent to an existing commercial fishing dock for tribal and non-tribal fishing operations. Dredging to provide adequate draft to the vessels that will be moored at the expanded dock and to provide a transit channel to deeper water is also proposed as part of the project.

The proposed project represents the second phase of the Makah Dock Project that began with the emergency demolition and replacement of the Makah Commercial Fishing Dock (Phase I) completed in 2014. The proposed dock extension and dredging addressed by this biological evaluation compose Phase II of the project.

The ERTV and associated vessels have been stationed at Neah Bay since 1999 under contract to Ecology. Owners and operators of vessels transiting through the Strait of Juan de Fuca (except for transits extending no further west than Race Rocks Light) contract the ERTV for compliance with state Ecology oil spill response contingency plan regulations and during vessel emergencies. The tugboat Jeffery Foss is stationed at the Makah Marina under charter to the Washington State Maritime Cooperative per a service agreement with the ERTV Compliance Group, and provides further oil spill response capability in the Neah Bay staging area as per the Strait of Juan de Fuca GRP.

Neah Bay is a critical staging area for oil spill response resources (including response vessels) under the Strait of Juan de Fuca GRP[1]. Pursuant to both Ecology and U.S. Coast Guard (USCG) regulations (WAC 172-183 and 33 CFR 155, respectively), the total oil capacity (both storage and engine fuel) of vessels transiting Neah Bay and waters of the strait is limited by spill resources staged within various response times. Because of infrastructure limits on staging capacity for response resources, the

[1] See http://www.ecy.wa.gov/programs/spills/preparedness/GRP/StraitJuanDeFuca/strait_juan.htm

6-hour planning standards are not met for Neah Bay (primarily the lack of storage capacity for recovered oil). As an interim measure, Ecology has allowed an alternative capacity limit determined by considering additional resources arriving from Port Angeles by hour-9 post spill event.

The proposed dock extension will provide a permanent mooring location for the oil spill response vessels, allow for more rapid response while improving functionality for equipment staging and loading operations, and bring the facility into full compliance with Ecology and USCG regulations. The project site was chosen to minimize the amount of new construction, as the proposed design builds onto the existing fishing dock trestle. This design eliminates the need for a new connection to the shore—the fishing dock and spill dock extension will share the same trestle for shore access. Additionally, the proposed design allows the spill dock extension to be constructed in deeper water, and thereby helps minimize the amount of dredging required to accommodate vessel draft.

The proposed action will require work below the ordinary high water mark of Neah Bay, which will require a Section 10 permit from the U.S. Army Corps of Engineers (USACE). This will represent a federal nexus requiring that the USACE evaluate the potential for effects to species or critical habitats listed or proposed for listing under the Endangered Species Act (ESA). The USACE will serve as the lead agency in this consultation. The purpose of this biological evaluation is to examine the effects of the project on ESA-listed species for purposes of consultation with the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) under Section 7 of the ESA.

1.1 Documentation of Relevant Correspondence

The Tribe contacted Pamela Sanguinetti, USACE, on 29 June 2016 to introduce the project and discuss its potential impacts, the appropriate best management practices (BMPs) and impact minimization measures to be used, and the anticipated requirements for permitting and consultation.

BergerABAM also coordinated with Lindsy Wright, USFWS, and Matt Longenbaugh, NMFS, via telephone between 16 June and 29 June 2016 regarding ESA-listed species presence in the action area, and the potential for impacts to ESA-listed species under USFWS and NMFS jurisdictions.

A pre-application meeting was held for the project at the USACE Seattle District office 5 October 2016. The following agency representatives were in attendance either in person or by phone: Justine Barton (Environmental Protection Agency [EPA]); Lauran Cole-Warner and Kaitlin Schnell (Dredged Material Management Office [DMMO], USACE); Pam Sanguinetti, Jessie Mizic, Scott Brown, Kathy Curry, and Juliana Houghton (USACE); Susan Smoley (USACE Section 408 coordinator); Conrad Newell (NMFS); Lori Kingsbury (Ecology); Lindsey Wright (USFWS); Bill

House (Washington State Department of Natural Resources [DNR]); and Celia Barton (DMMO, DNR).

A progress meeting occurred on 8 September 2017 to discuss project progress and coordination with the USACE-related project to deepen the USACE navigation channel at the entrance to Neah Bay to -25 feet mean lower low water (MLLW). The meeting was attended by USACE personal from regulatory section, the navigation section, and the DMMO, as well as Ecology and the DNR. Members from the Tribe and their consultants were also present. The attendees included Pamela Sanguinetti, Scott Brown, Chemine Jackels, Lori Morris, John Hicks, Walker Messi, and Deborah Nelson (USACE); Lauren Warner (DMMO, USACE); Bridget Kaminski-Richardson (DNR); Loree Randall (Ecology); Bill Parkin, Norman Down, Carol Reamer, and Aaron Parker (Makah Tribe); and Sally Fisher (BergerABAM).

The USACE proposes to place the dredged material from the channel deepening on the southeastern portion of the Neah Bay shoreline to restore a previous historic beach. The beach site is located east of the Makah Marina and extends eastward to the USCG pier as shown on Sheet 8. The site has been conceptually designed for about 250,000 cubic yards.

The USACE has recently determined that volume of dredging at the channel will be approximately 53,000 cubic yards. Because that volume is not sufficient to completely restore the beach, all parties agreed that suitable material from the Makah project dredging (187,000 cubic yards) could also be used at the beach restoration site.[2]

This revised biological evaluation addresses the project change described above and other revisions to the project mitigation, as discussed below.

2.0 PROPOSED ACTION AND ACTION AREA

2.1 Project Overview

Figures showing project components (Sheets 1 through 14) are included in Appendix A. Sheet 1 is a map of the project site and vicinity. Sheet 2 provides an aerial view of the existing site plan. Sheets 3 through 11 are plan and cross-sectional views of the proposed dock extension, dredge area, and dredged material/beach restoration sites. Sheet 12 shows the action area for the proposed project.

The project site is located within Neah Bay on the southern shore of the Strait of Juan de Fuca. The site consists of the open water of Neah Bay to the west and northwest of the Commercial Dock (existing dock) (Sheet 1).

[2] The Makah Tribe was planning to develop a beneficial use site to improve shallow water habitat in the northwest corner of the bay. This concept has been set aside, at this time, due to the need for material at the restoration site.

The shoreline in the vicinity of the project site is protected with rock riprap extending to the top of the shoreline on both sides of the dock. There is very little aquatic or upland vegetation at the site.

2.1.1 Proposed Dock Extension

The proposed dock extension (20 feet wide) will extend at an angle from the trestle of the existing commercial fishing dock as shown on Sheet 3. The extension will be approximately 563 feet long and orientated to the northwest from the existing trestle. Two finger piers (24 feet wide) will extend approximately 325 feet and 340 feet to the north from the angled dock extension (Sheet 6). The new extension will be constructed on steel piles with concrete decking and an asphalt pavement overlay. Precast pile caps and deck panels will be used to minimize the amount of on-site placement of fresh concrete. The new extension will be supported by up to 220 steel pipe piles—eighty-five 24-inch-diameter piles and one hundred thirty-five 18-inch-diameter piles (Sheets 3 through 5).

2.1.2 Proposed Dredging

The project will require about 208,000 cubic yards of dredging to increase the depth of the new berth area to Elevation -25 feet MLLW, plus 1 foot of allowable overdredge) to accommodate the drafts of the spill response vessels (Sheets 6 and 7).

Characterization of the proposed dredge material in accordance with the USACE Dredged Material Management Program (DMMP) indicates that 186,871 cubic yards is suitable for in-water placement and 21,270 cubic yards of material will require upland disposal due to elevated mercury in the material (see Appendix B).

The dredging will not occur in any intertidal habitat. The existing elevations in the proposed dredging area range from -5 feet MLLW to -25 feet MLLW. Most of the dredging will occur at depths below -15 feet MLLW as shown on Sheet 2.

2.2 In-water Impacts

2.2.1 New Structures

The new dock extension will add 34,730 square feet of overwater shading. The new structure will not shade or impact any intertidal habitat. The structure will be constructed over subtidal habitat ranging from -2 to -25 feet MLLW (existing mudline). The 220 new piles result in 688 square feet (0.02 acre) of benthic habitat loss.

2.2.2 Dredging

The area to be dredged will convert shallow and subtidal habitat to -25 feet MLLW as summarized in Table 1 below. Dredging will not occur in the intertidal area.

Impacts from dredging will consist of increased turbidity during the dredging activity. The turbidity increase will be temporary and short term and will be monitored and controlled during dredging. Elevated turbidity will be allowed only

in the permit-designated mixing zone (generally 150 feet from the point of dredging activity).

2.3 Project Benefits and Mitigation

The Tribe has identified a series of actions that will serve to benefit habitat and/or conditions at Neah Bay and to mitigate project impacts. Those activities are described below.

2.3.1 Derelict Dock Removal

An existing unused (derelict) dock located west of the project site (Sheet 12) burned in July 2017. The trestle was estimated to be 429 feet by 15 feet with about 250 piles, the icehouse to be about 109 feet by 32 feet, and the dock platform to be 191 feet by 57 feet with nearly 270 piles. The total area of the structure is approximately 20,889 square feet.

Approximately 15 tons of burned piles, decking, and associated debris have been removed by the Tribe, resulting in removal of 3,840 square feet of overwater shading, and roughly 70 piles or 123 square feet of piling, to date. The Tribe is coordinating with DNR for future removal of the entire dock as mitigation for overwater coverage caused by the new extension. Photos of the burned derelict dock are located in Appendix C.

2.3.2 Derelict Sunken Vehicle Removal

There are three derelict sunken vessels in the Makah Marina. The Tribe has been awarded a $150,000 grant from National Oceanic and Atmospheric Administration (NOAA) to remove these vessels. The Tribe is contributing a 100 percent match to the grant for this activity. The boats are 65, 68, and 36 feet long and have an estimated combined benthic footprint of 2,355 square feet.

2.3.3 Beach Restoration

Approximately 187,000 cubic yards of dredged material from the extension project will be placed on the southeast shoreline to restore a historic beach that has eroded since the jetty along the north side of the bay was constructed. Historic photos of the beach are provided on Sheets 9 and 10. Profiles of the beach at various times between the early 1900s and the present are shown on Sheet 11.

The beach will be located as shown on Sheet 11 and will cover approximately 19 acres ranging from Elevation +15 to 0 feet MLLW. The placement site has a maximum capacity of about 250,000 cubic yards. The site will also likely be used for material dredged for the future USACE navigation channel project.

2.3.4 Phase 2 Debris Removal

Approximately 400 tons of debris was removed from the project area when the commercial fishing dock (Phase 1) was constructed in 2014. The 2016 survey identified additional remaining debris in the vicinity of the extension and the commercial dock, including remaining metal debris, tires, fishing nets, piping,

generators, and various other items. That debris will be removed during the extension project construction.

Tables 1 and 2 provide summaries of the proposed overwater coverage of the structure, pile quantity, and associated benthic substrate coverage.

Table 1. Project Overwater Coverage Summary

Proposed Structure (sf)		
Elevation (MLLW)	**Type of Habitat (Existing)**	**Dock and Trestle Extension Total (SF)**
MHHW to -2 feet MLLW	Intertidal	-0-
-2 feet MLLW to -25 feet MLLW	Subtidal	-34,730 SF (0. 79 acre)
		34,730 SF (0.70-acre increase)

MLLW=mean lower low water; MHHW=mean higher high water; sf=square feet

Table 2. Impacts and Mitigation Summary

Impacts (sf)			Mitigation (sf)		Net Effect
Overwater Shading	New Dock	34,370 sf	Derelict dock (previously removed)	3,840	-13,481-sf net overwater shading
			Derelict dock (future removal)	17,049	
			Total	**20,889**	
Benthic Habitat	New 18" Steel Piles (135)	-239 sf	Derelict dock piles (removed by Makah)	250 piles +442 sf	+9,275-sf net benthic gain
			Derelict dock piles (future removal)	270 piles +478 sf	
	New 24" Steel Piles (85)	-267 sf	Sunken vessel removal	+2,355 sf	
			Perimeter and under-pier debris removal	+6,000 sf	
	Total	**-688 sf**	**Total**	**+8,778 sf**	
Dredging	(18 acres)	784,080 sf	Beach restoration (19 acres)	**827,640 sf**	43,560-sf net beach restoration

2.4 Construction Elements

2.4.1 Pile Installation

Approximately 135 18-inch-diameter piles and 85 24-inch-diameter hollow steel piles will be installed to support the new structure. Piles will be installed using a vibratory hammer operated from either the temporary work platform (in shallow water) or from a barge (in deeper water). Piles will most likely be transported to the site and stored on site on a work barge.

Pile driving will be performed to the greatest extent possible using a vibratory hammer, and piles will be driven to final tip elevation or proofed, as necessary, with an impact hammer. Because a geotechnical investigation has not yet been completed for the project, it is not possible to accurately determine how many piles, if any, may need supplemental impact driving to reach final tip elevation. For this reason, a

conservative estimate has been made that up to 1,000 strikes per day may be necessary to impact drive piles to their final tip elevation and to proof the piles for load capacity. Approximately 25 percent of the piles (55 piles) are typically proofed, but proofing is not necessary if the piles otherwise require impact driving to achieve final tip elevation. A bubble curtain or similarly effective noise attenuation device will be employed during all impact pile-driving activities to reduce underwater noise levels. All pile installation will be conducted during the approved in-water work window (16 July to 15 February).

2.4.2 Debris Removal and Dredging

Approximately 6,000 to 7,000 square feet of debris (including metal debris, tires, fishing equipment, and piping) will be removed from the mudline prior to construction. The debris will be removed using an excavator with a clamshell operated from a work barge or temporary work platform. The debris will be placed in a barge to be disposed at an approved upland landfill facility.

Approximately 208,000 cubic yards of silty sand/sandy gravel material will be dredged from the project area using mechanical (clamshell) or hydraulic dredge equipment. This material has been classified in accordance with Washington State Sediment Management Standards, as described in the DMMP Suitability Determination dated 16 May 2017 (attached as Appendix B) The suitability determination classifies 21,270 cubic yards of material in the southeastern portion of the dredge prism as unsuitable for beneficial use (barring additional analysis) and will be placed at an upland disposal site. The remaining 186,000 cubic yards of material is suitable for beneficial use and will be placed at the beach restoration site. Dredging will be accomplished while employing appropriate BMPs to minimize potential impacts to water quality. Dredging and dredge material placement activities will occur only within the in-water window for the area.

An existing dock located west of the field dock burned in July 2017 with the estimated burned area being 3,840 square feet (referred to as "burned derelict dock). Specifically, where the trestle meets the dock platform, there was a loss of approximately 1,027 square feet of the trestle and 2,813 square feet of the dock. The trestle was estimated to be 429 feet by 15 feet with about 250 piles, the icehouse to be 109 feet by 32 feet, and the dock to be 191 feet by 57 feet with nearly 270 piles. Mitigation for the project will include removal of this dock in its entirety, which includes the trestle and icehouse, resulting in approximately 20,889 square feet of removal of overwater coverage and removal of 520 piles.

2.4.3 Overwater Construction

The piles, pile caps, stringers, deck paneling, and associated structures will be installed when the dredging is completed. These elements will consist of precast concrete, while decking will be cast-in-place concrete covered with asphalt or

concrete paving. Using precast pile caps will reduce the amount of concrete cast over water by approximately 67 percent.

Overwater activities would be conducted according to the BMPs established for the project, which will help reduce the potential for impacts to water quality, such as by spills or release of construction debris into the water. Overwater construction would not be limited to the in-water work window.

2.5 Minimization Measures and Best Management Practices

The project has adopted a list of impact minimization measures and BMPs to reduce, eliminate, or minimize the effects of the project to listed species or habitat. The minimization measures and BMPs are described below.

2.5.1 Minimization Measures

The proposed action includes the following impact avoidance and minimization measures to avoid and minimize the potential for adverse environmental effects. General impact avoidance and minimization measures include those listed below.

- In-water work will be conducted only during the approved in-water work window for marine waters of Tidal Reference Area 10 where bull trout are present (16 July to 15 February).
- Project construction will be completed in compliance with Washington State Water Quality Standards (WAC 173-201A), including the following.
  - Petroleum products, fresh cement, lime, concrete, chemicals, or other toxic or deleterious materials will not be allowed to enter surface waters.
  - There will be no discharge of oil, fuels, or chemicals to surface waters, or onto land where there is a potential for entry into surface waters.
  - Fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. will be checked regularly for leaks, and materials will be maintained and stored properly to prevent spills.
- A spill prevention control and countermeasures (SPCC) plan will be prepared by the contractor and used during all demolition and construction operations. A copy of the plan with any updates will be maintained at the work site.
- The SPCC plan will outline BMPs, responsive actions in the event of a spill or release, and notification and reporting procedures. The plan will also outline management elements, such as personnel responsibilities, project site security, site inspections, and training.
- The SPCC plan will outline the measures to prevent the release or spread of hazardous materials, including those that may be found on site; encountered

during construction but not identified in contract documents; and any hazardous materials that are stored, used, or generated on the construction site during construction activities. These items include, but are not limited to, gasoline, diesel fuel, oils, and chemicals.

- Applicable spill response equipment and material designated in the SPCC plan will be maintained at the job site.

- The amount of overwater concrete placement will be minimized by using precast structural elements (pile caps, stringers, etc.) for about 67 percent of the total concrete needed to build the trestle and dock.

2.5.2 General Best Management Practices

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

- The new structure will be designed to capture and treat all stormwater prior to discharge.

- The new structure will be designed to minimize the number of piles needed, thus, minimizing benthic impact, shading impacts, and construction noise.

- Overwater concrete placement will be minimized by incorporating precast structural elements for 67 percent of the concrete needed.

- Checking equipment for leaks and other problems that could result in the discharge of petroleum-based products or other material into waters of Neah Bay.

- Corrective actions will be taken in the event of any discharge of oil, fuel, or chemicals into the water, including the following.

  - In the event of a spill, containment and cleanup efforts will begin immediately and be completed in an expeditious manner in accordance with all local, state, and federal regulations and taking precedence over normal work. Cleanup will include proper disposal of any spilled material and used cleanup material.

  - The cause of the spill will be ascertained and appropriate actions taken to prevent further incidents or environmental damage.

  - Spills will be reported to Ecology's Northwest Regional Spill Response Office at 425/649-7000.

- Work barges will not be allowed to ground out.

- Excess or waste materials will not be disposed of or abandoned waterward of ordinary high water or allowed to enter waters of the state. Waste materials will be disposed of in an appropriate manner consistent with applicable local, state, and federal regulations.

- Demolition and construction materials will not be stored where wave action or upland runoff can cause materials to enter surface waters.

- Oil-absorbent materials will be present on site for use in the event of a spill or if any oil product is observed in the water.

2.5.3 Pile Installation BMPs

Pile installation BMPs to be applied will include the following.

- A vibratory hammer will be used to drive steel piles, to the extent possible, to minimize noise levels.

- A bubble curtain or other similarly effective noise attenuation device will be employed during all impact pile proofing or installation.

- Marine mammal monitoring will be conducted during pile installation and removal activities to reduce the potential for impacts to ESA-listed marine mammals. A marine mammal monitoring plan (MMMP) is provided as Appendix D.

- Marbled murrelet monitoring will be conducted during all impact pile installation. A marbled murrelet monitoring plan is being prepared and will be provided to the USACE and USFWS 30 days prior to the start of impact pile driving.

- Pile installation will be conducted during the WDFW-approved in-water work window for Tidal Reference Area 10 (16 July to 15 February), the period established to minimize impacts to aquatic species. All in-water work will be completed within the work window, when ESA-listed species are least likely to be present.

2.5.4 Overwater Concrete Placement Minimization and BMPs

On-site concrete placement will follow appropriate BMPs, including the following.

- Wet concrete will not come into contact with surface waters.

- Forms for any cast-in-place concrete structure will be constructed to prevent leaching of wet concrete.

- Concrete process water will not be allowed to enter the bay. Any process water/contact water will be routed to a contained area for treatment and will be disposed of at an upland location.

2.5.5 Dredging and Dredged Material Placement

Dredging may be completed using either mechanical (clamshell bucket) or hydraulic dredging equipment. BMPs associated with dredging may include, but are not limited to, the following.

Mechanical Dredging

- The dredge bucket will not over-penetrate surface sediments, which can cause sediment to be expelled from the vents in the bucket or cause sediment to become piled on top of the bucket, and then become eroded during bucket retrieval.

- The bucket will be closed smoothly when it is collecting dredge material.

- The method of operating the dredge will be modified based on changing site conditions, such as tides, waves, currents, and wind.

- Multiple bites while the bucket is on the bottom will not be permitted.

- Dredged material aboard the barge will be observed daily for the presence of fish to ensure that they are not being impinged by the clamshell bucket. If impingement occurs, crane operation will be slowed to increase opportunity for fish to avoid the bucket.

- The barge will be managed such that the dredged sediment load does not exceed the capacity of the barge. The load will be placed in the barge to maintain an even keel and to avoid listing.

Hydraulic Dredging

- The suction head of hydraulic dredge will be maintained at the mudline to the extent practicable.

- A buffer plate or other means will be used to reduce flow discharge of the hydraulic dredge at the placement area.

In-water Placement

- Hay bales, silt fences, or similar structures will be placed around the boundary of the beach restoration area while dredged material is placed minimize turbidity impacts to the surrounding areas during dredged material placement.

2.6 Action Area

This section describes the action area for the proposed action. The action area is the defined geographic area that could be affected by the direct and indirect effects of

the proposed project. The action area (Sheet 12) has been established based on the following.

- The project footprint includes the limits of the proposed in-water construction activities and dredged material placement areas.
- The extent of temporarily elevated underwater noise levels associated with pile installation.
- The extent of temporarily elevated terrestrial noise levels associated with pile installation.
- The extent of temporarily increased levels of sedimentation and turbidity associated with pile installation, dredging, and dredged material placement.

2.6.1 Project Footprint

The action area includes the overall footprint of the proposed action, which will be limited to the physical footprint of the proposed dock extension structures, dredge area, dredge placement area(s), and immediately adjacent areas. This portion of the action area includes the physical locations of the proposed in-water and overwater structures, the proposed dredge prism, and the proposed location for dredged material placement (Sheet 12).

2.6.2 Underwater Noise

2.6.2.1 Impact Pile Installation

The proposed pile installation activities will result in temporarily elevated underwater noise levels. The zone of influence for underwater noise has been determined using the practical spreading loss model described in the Washington State Department of Transportation (WSDOT) Training Manual (WSDOT 2015), which assumes a 4.5-dB $_{RMS}$ reduction per doubling of distance.[3] Because no baseline data is available regarding background noise levels in Neah Bay, the baseline underwater noise level within the action area is conservatively assumed to be approximately 120 dB_{RMS} (WSDOT 2013), although actual background underwater noise levels may be higher, given the amount of commercial and recreational vessel traffic in the bay.

The worst-case estimate of underwater noise levels that could be generated during impact pile driving of 18- and 24-inch steel piles is 207 dB_{PEAK}, 194 dB_{RMS}, and 178 dB_{SEL} (measured at a distance of 10 meters or 33 feet from the pile) prior to any attenuation (California Department of Transportation [Caltrans] 2012). A noise attenuation device (most likely an unconfined bubble curtain or similarly effective device) will be employed during all impact pile installation activities. These devices, when properly installed and maintained, typically provide at least 5 dB of

[3] RMS = root mean square

attenuation for piles of this size and type, and frequently provide higher levels of attenuation (Caltrans 2012). However, in order to make a conservative estimate of the extent of underwater noise for purposes of this consultation, no attenuation has been factored into the noise analysis. Conservative estimates of the actual anticipated maximum underwater sound pressure levels that would be produced during impact pile driving, therefore, are 207 dB_{PEAK}, 194 dB_{RMS}, and 178 dB_{SEL}.

The following equation shows how the practical spreading loss model was used to calculate the distance that will be required to attenuate project-related underwater noise to the baseline decibel level of 120 dB_{RMS} for purposes of establishing the action area.

$TL = 15*Log (R_1/R_2)$

TL = amount of spreading loss (known noise level – ambient noise level)

R_1 = distance where noise attenuates

R_2 = range of known noise level (10 meters in this case)

The practical spreading loss model equation, solved for R_1, calculates the distance at which project noise would attenuate to background conditions:

$R_1 = (10^{(TL/15)})(R2) = (10^{((207-120)/15)})(10) = 2{,}154{,}434$ meters (1,338 miles).

The results of the practical spreading underwater noise attenuation indicate that peak underwater noise from impact pile installation would attenuate to background levels within approximately 2,154,434 meters, or over 1,338 miles. This is a worst-case, hypothetical model, and attenuation will actually occur much sooner, because sound waves travel in straight lines and the aquatic portion of the action area is constrained by existing jetties and breakwaters.

For the purpose of this consultation, and consistent with the principles of noise attenuation, the extent of impact attributable to temporarily elevated underwater noise has been estimated to extend throughout the water column of Neah Bay, in straight line distances from the proposed pile-driving activities, in all directions. The zone of influence is shown graphically on Sheet 12.

2.6.2.2 Vibratory Pile Installation

Template piles will be installed with a vibratory hammer. WSDOT recently published a memorandum reporting average root mean square (RMS) values associated with vibratory installation of 30-inch steel piles as ranging from 164 to 176 dB_{RMS} with an overall average RMS value of 171 dB_{RMS} (Laughlin 2010). WSDOT also published data in 2011 documenting average underwater sound pressure levels of 150 dB_{RMS} during vibratory removal of timber piles (WSDOT 2011). For purposes

of this consultation, it has been assumed that underwater noise associated with vibratory pile installation and removal will not exceed 176 db_{RMS}.

The practical spreading loss model shows the distance that will be required to attenuate 176 dB_{RMS} underwater noise during vibratory pile removal to the background decibel level of 120 dB_{RMS} for purposes of establishing the action area.

$$R1 = (10^{(TL/15)})(R2) = (10^{((176-120/15)})(10) = 54{,}117 \text{ meters}$$

The results of the practical spreading underwater noise attenuation model indicate that underwater noise theoretically would attenuate to background levels at approximately 33.6 miles, or roughly 54,117 meters. This, too, is a theoretical scenario, and the model is not likely accurate at this scale. The position of existing breakwaters and nearshore structures within the action area will limit the actual extent of temporarily elevated underwater noise to a maximum distance of approximately 5,000 feet.

For the purpose of this consultation—and consistent with the principles of noise attenuation—the extent of potentially detectable, temporarily elevated underwater noise during both impact pile installation and vibratory pile installation and removal has been estimated to extend throughout the water column of Neah Bay in straight-line distances from the proposed pile-driving activities to the point of intersection with the nearest land mass or structure. This zone of influence is the same as the zone of influence for impact pile installation and is shown graphically on Sheet 12.

2.6.3 Terrestrial Noise

Baseline and construction-related noise levels were inferred using a technique recommended by WSDOT (WSDOT 2013). That guidance includes information regarding noise levels associated with construction procedures from the City of Boston's noise assessment methodology (Thalheimer 2000) and noise attenuation data from the Federal Transit Administration's (FTA) construction noise methodology (FTA 2006).

Peak terrestrial noise generated during impact pile installation has been estimated to be approximately 110 decibels (dBA), measured at 50 feet (FTA 2006). The action area is adjacent to a busy marina and is the site of a busy commercial fishing operation. For this reason, the baseline noise levels associated with the action area are estimated to be moderate (65 dBA measured at 50 feet). Soft site conditions were assumed for noise attenuation purposes because the surrounding terrestrial landscape is largely forested, so the linear attenuation rate was estimated to be approximately -7.5 dBA per doubling of distance.

Table 3 shows the attenuation of terrestrial noise from project activities to the baseline decibel level of 78 dBA.

Table 3. Project-Related Terrestrial Noise Attenuation

Distance from Project Activity (ft)	Construction Noise in dBA (Point Source, Soft Site) (-7.5 dBA reduction per doubling of distance)
50	110.0
100	102.5
200	95.0
400	87.5
800	80.0
1,600	72.5
3,200	65.0

Based on the noise attenuation assumptions listed in Table 3, terrestrial noise from impact pile driving is expected to attenuate to ambient conditions at a distance of approximately 3,200 feet from the location of project activities. This area is shown on Sheet 9.

2.6.4 Sedimentation/Turbidity

The proposed pile installation/removal and dredging activities have the potential to elevate levels of sedimentation and turbidity temporarily. The zone of influence associated with temporarily elevated levels of sedimentation and turbidity has been determined based on the turbidity mixing zone standard for marine waters authorized by Ecology and defined in WAC 173-201A-210. For projects working within or along lakes, ponds, wetlands, estuaries, marine waters, or other non-flowing waters, the point of compliance is at a radius of 150 feet from the activity causing the turbidity exceedance (Sheet 12).

3.0 STATUS OF SPECIES AND CRITICAL HABITAT

This section discusses the ESA-listed species and critical habitat known to occur, or with the potential to occur, within the action area (see Appendix E for species lists).

Information for this biological evaluation regarding listed species was obtained from the USFWS website (USFWS 2017) and the NMFS website (NMFS 2017) on 18 September 2017. Additional information came from the WDFW Priority Habitat and Species (PHS) and SalmonScape databases (WDFW 2017a and 2017b).

Table 4. Species Listed under the ESA Addressed in this Biological Evaluation

Species Name			ESA Listing Status	Critical Habitat	Critical Habitat in Action Area
Common Name	Scientific Name	ESU or DPS*			
Chinook Salmon	*(Oncorhynchus tshawytscha)*	Puget Sound ESU	Threatened	Designated	No
Chum Salmon	*(Oncorhynchus tshawytscha)*	Hood Canal ESU	Threatened	Designated	No
Steelhead	*(Oncorhynchus mykiss)*	Puget Sound DPS	Threatened	Designated	No

Species Name			ESA Listing Status	Critical Habitat	Critical Habitat in Action Area
Common Name	Scientific Name	ESU or DPS*			
Bull Trout	*(Salvelinus confluentus)*	Coastal Puget Sound DPS	Threatened	Designated	No
Orca	*(Orcinus Orca)*	Southern Resident DPS	Endangered	Designated	Yes
Humpback Whale	*(Megaptera novaeangliae)*	NA	Endangered	Not designated or Proposed	NA
Boccaccio	*(Sebastes paucispinis)*	Puget Sound/ Georgia Basin DPS	Endangered	Designated	No
Yelloweye Rockfish	*(Sebastes ruberrimus)*	Puget Sound/ Georgia Basin DPS	Threatened	Designated	No
Canary Rockfish	*(Sebastes pinniger)*	Puget Sound/ Georgia Basin DPS	Threatened	Designated	No
Pacific Eulachon	*(Thaleichthys pacificus)*	Southern DPS	Threatened	Designated	No
Marbled Murrelet	*(Brachyramphus marmoratus)*	CA/WA/OR DPS	Threatened	Designated	No

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

According to the USFWS species list, although the species listed in Table 4 and/or their designated critical habitat do occur, or may occur, within Clallam County, they are not addressed in this biological evaluation for the reasons that are discussed following the table.

Table 5. Species Listed but Not Addressed in this Biological Evaluation

Species Name		ESA Listing Status
Common Name	Scientific Name	
Taylor's Checkerspot Butterfly	*(Euphydryas editha taylori)*	Endangered
Northern Spotted Owl	*(Strix occidentalis caurina)*	Threatened
Streaked Horned Lark	*(Eremophila alpestris strigata)*	Threatened
Short-tailed albatross	*(Phoebastria albatrus)*	Endangered
Yellow-billed Cuckoo	*(Coccyzus americanus)*	Threatened
Leatherback Sea Turtle	*(Dermochelys coriacea)*	Endangered

While information from USFWS (USFWS 2017) identified the potential for northern spotted owl, streaked horned lark, yellow-billed cuckoo, Taylor's checkerspot butterfly, and short-tailed albatross to occur within the county, WDFW PHS data does not indicate any known occurrence of these species within the action area, and the action area does not provide any suitable habitat for these species. Similarly, leatherback sea turtle are occasionally spotted in marine waters off the coast of Washington, but they are not known or expected to occur within the waters of Neah Bay. Based on the lack of suitable habitat for the species listed in Table 5, it is determined that the proposed project will have no effect on them, and they are not addressed in this biological evaluation.

4.0 BIOLOGICAL REQUIREMENTS

This section describes the biological requirements of the listed species that have the potential to occur within the action area. These descriptions include run timing, biological requirements, and factors affecting recovery.

4.1 Chinook Salmon (*Oncorhynchus tshawytscha*)

The Puget Sound ESU of Chinook salmon includes all naturally spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound (70 FR52630). Puget Sound ESU Chinook salmon are listed as threatened by NMFS under the ESA. Critical habitat for Puget Sound Chinook Salmon was designated in 2005 and consists of river and marine nearshore habitat within the Puget Sound basin and on the Olympic Peninsula east of the Elwha River. No designated Puget Sound Chinook salmon critical habitat is present within the action area.

4.1.1 Distribution and Habitat Requirements

Compared to the other Pacific salmon, Chinook salmon have the most complex life history with a large variety of patterns. The length of freshwater and saltwater residency varies greatly (Myers et al. 1998). Channel size and morphology, substrate size and quality, water quality, and cover type and abundance may influence distribution and abundance of Chinook salmon. After three to five years in the ocean, Puget Sound stocks return to the area's rivers and tributaries to spawn in the spring and fall. Spawning occurs in the mainstems of larger tributaries in coarse gravel and cobble (Myers et al. 1998). Chinook return to the Sekiu River and Hoko River, which are located outside of the action area to the east.

Most juvenile summer/fall Chinook salmon in Strait of Juan de Fuca river systems migrate to the marine environment as smolts during their first year, although their early life history patterns vary. Some migrate downstream almost immediately after emerging from the gravel. Others migrate downstream and enter side channels where they may rear for several weeks before migrating to marine waters. A third life history strategy involves a more extended rearing time (up to two years) in the river before migrating to saltwater.

4.1.2 Status

Chinook salmon are documented in the Sekiu and Hoko Rivers. Spawning ground surveys have found Chinook present in depressed numbers in the Hoko system through the 1990s. Very low numbers of Chinook also spawn in the Sekiu River (Smith 1999). The status of the Sekiu Chinook was identified as critical during the 1990s (Smith 1999). Habitat degradation from stream blockages, channelization, contamination, forest practices, and urbanization is listed as the primary cause of decline.

4.1.3 Presence in Action Area

Although unlikely, Puget Sound ESU Chinook salmon adults may potentially migrate through the action area almost year-round. WDFW PHS does not document

Chinook in Village or Agency Creeks (WDFW 2015), which are the closest tributaries within the action area. Therefore, any adult Puget Sound ESU Chinook salmon found in Neah Bay likely would be stopping temporarily to feed but would not be using the area as a migration corridor.

The portion of Neah Bay that is within the action area does not provide any suitable spawning or rearing habitat for Chinook salmon. If they are present, migrating adults are expected to be moving quickly through the action area.

Puget Sound ESU Chinook salmon juveniles could be foraging within the action area during the months of January and February, but would not be expected to use the exposed, non-vegetated areas in the vicinity of the project extensively.

4.2 Chum Salmon (*Oncorhynchus keta*)

Hood Canal summer-run chum are listed as threatened by NMFS under the ESA on 5 March 1999 (64 FR 14508) and the threatened listing was reaffirmed on 28 June 2005 (70 FR 371160). The ESU includes all naturally spawned populations of summer-run chum salmon in Hood Canal and its tributaries. This ESU migrates through the Strait of Juan de Fuca. Critical habitat for Hood Canal summer-run chum salmon was designated in 2005 and consists of tributary and marine nearshore habitat within Hood Canal. No designated Puget Sound Chinook salmon critical habitat is present within the action area.

4.2.1 Distribution and Habitat Requirements

Summer chum salmon enter rivers from mid-August through mid-October (Johnson et al. 1997). Spawning typically occurs soon after river entry and migration to spawning grounds that are typically in the lower reaches. Emergence of fry from spawning gravel typically begins in January, and these fish immediately migrate to the estuary where they rear for a few days to a few weeks. Chum fry inhabit shallow nearshore areas often within 15 centimeters of the surface, as this surface orientation likely enables chum to occupy the freshwater lens while acclimating to seawater and movement along the nearshore may reduce predation from marine fish and enhance bioenergetic efficiency in areas of warmer water. Most summer chum salmon spend two or three winters at sea and return at age three or four.

4.2.2 Status

Data for chum in Water Resource Inventory Area (WRIA) 19 has only been monitored since 1984, so historical data is very limited. Chum escapement levels have varied greatly with a small increase in recent years. Chum levels in the Hoko and Sekiu Rivers have not been well monitored in the past. All chum stocks in the region are believed to be native.

4.2.3 Presence in the Action Area

Chum migrate through the intertidal and nearshore waters of the Strait of Juan de Fuca, and winter populations have been documented in Agency and Village Creeks

located within the action area (Smith 1999). Chum spawning occurs in Hoko and Sekiu Rivers, as well as other area rivers and streams, but these fish are of the Strait of Juan de Fuca stock, which is not currently listed under the ESA. Hood Canal summer-run ESU chum salmon migrate through the Strait of Juan de Fuca, but their presence within Neah Bay is unlikely.

4.3 Steelhead (*Oncorhynchus mykiss*)

Puget Sound distinct population segment (DPS) steelhead are listed as threatened by NMFS under the ESA (11 May 2007; 72 FR 26722). The action area within Neah Bay represents a migration corridor for this DPS. Olympic Peninsula DPS steelhead are not listed under the ESA and are considered a healthy population by NMFS (NMFS 2013). Critical habitat was designated for Puget Sound DPS steelhead on 2 February 2016. The critical habitat designation includes several freshwater streams and tributaries in Puget Sound but does not include nearshore marine waters. No proposed critical habitat is present within the action area.

4.3.1 Distribution and Habitat Requirements

Steelhead is a more widely distributed anadromous fish than other salmonids. The life-history pattern of steelhead can be very complex, involving repeated spawnings and continuous reversals of freshwater to ocean phases. The distribution and abundance of steelhead are thought to be influenced by water temperature, stream size, flow, channel morphology, vegetation type and abundance, and channel substrate size and quality.

Steelhead use a variety of habitats throughout the freshwater portion of their life history. As with all salmonid species, water temperatures and intra-gravel flow are also important for spawning and incubation. After fry emerge from the gravels, they seek complex habitat of boulders, rootwads, and woody material along the stream margins. As juveniles become older and larger, they move downstream to rear in larger tributaries and mainstem rivers. Undercut banks, large woody debris (LWD), and boulders are all used by larger juveniles.

4.3.2 Status

Factors contributing to the decline of Puget Sound DPS steelhead include blocked access to historical habitat, habitat degradation, channelization, contamination, forest practices, and urbanization.

4.3.3 Presence in Action Area

WDFW PHS data indicate that Village and Agency Creeks provide documented spawning habitat for Puget Sound DPS winter steelhead (WDFW 2013). While the action area does not provide suitable spawning habitat, the action area does represent a migratory corridor for adults and outmigrating juveniles. Puget Sound DPS steelhead adults could be present at all times of the year and would be migrating upstream towards Village or Agency Creeks. Puget Sound DPS steelhead juveniles could be migrating downstream from April through June. Rearing habitat

is limited within Neah Bay, and it is expected that juveniles likely outmigrate rapidly through the bay.

4.4 Bull Trout (*Salvelinus confluentus*)

The Puget Sound DPS bull trout are listed as threatened by the USFWS under the ESA. There is no designated critical habitat within or near the action area. (70 FR 56212-56311). The proposed action area is located within the Puget Sound DPS for bull trout. The Puget Sound DPS includes all natural spawning populations of bull trout in the Puget Sound basin, including in the streams that flow into Puget Sound. The Puget Sound DPS bull trout is a federal threatened species. Bull trout are piscivorous and are the only native char.

4.4.1 Distribution and Habitat Requirements

Once widely distributed throughout the Pacific Northwest, bull trout have been reduced to approximately 44 percent of their historical range. Compared to other salmonids, bull trout are thought to have more specific habitat requirements, and are most often associated with undisturbed habitat with diverse cover and structure. Spawning and rearing are thought to be primarily restricted to relatively pristine cold streams, often within headwater reaches (Rieman and McIntyre 1993). Adults can reside in lakes, reservoirs, and coastal areas, or they can migrate to saltwater (63 FR 31647). Juveniles are typically associated with shallow backwater or side-channel areas, while older individuals are often found in deeper pools sheltered by large organic debris, vegetation, or undercut banks (63 FR 31467). Water temperature is also a critical factor for bull trout, and areas where water temperature exceeds 59 degrees F (15 degrees C) are thought to limit distribution (Rieman and McIntyre 1993).

4.4.2 Status

Key factors in the decline of bull trout populations include harvest by anglers, impacts to watershed biological integrity, and the isolation and fragmentation of populations. Changes in sediment delivery (particularly to spawning areas), degradation and scouring, shading (high water temperature), water quality, and low hydrologic cycles adversely affect bull trout. Therefore, impacted watersheds are negatively associated with current populations. Additionally, bull trout appear to be affected negatively by non-native trout species through competition and hybridization.

4.4.3 Presence in Action Area

The waters of Neah Bay provide little potentially suitable habitat for bull trout. WDFW PHS data indicate that bull trout have not been documented within Village or Agency Creeks (WDFW 2013). For this reason, bull trout are unlikely to be present within the action area. Bull trout may occasionally forage within the bay during migration through the Strait of Juan de Fuca, but their presence is likely limited.

4.5 Southern Resident Orca (*Orcinus Orca*)

Southern Resident orcas, first protected under the Marine Mammal Protection Act (MMPA) in 1972, were considered to be depleted under the MMPA in May 2003. Drastically reduced from 1965 through 1975 for reasons that may include the capture of the animals for marine parks, the Southern Resident orca was considered a DPS of the orca whale species in August 2004 and was proposed as threatened under the ESA in December 2004. In November 2005, the Southern Resident orca was listed as an endangered species under the ESA. Their population currently stands at approximately 82 whales.

4.5.1 Distribution and Habitat Requirements

Southern Resident orcas occur in large, stable pods with memberships ranging from 10 to approximately 60 whales. Their primary prey is fish and their distribution is closely tied with peak abundance of various species of salmon prey. The assemblage contains three distinct pods (J pod, K pod, and L pod), and is considered a stock under the MMPA. Their range during the spring, summer, and fall includes the inland waterways of Puget Sound, the Strait of Juan de Fuca, and the Southern Georgia Strait. Little is known about the winter movements and range of the Southern Resident stock. Southern Resident orcas have not been seen to associate with other resident whales. Mitochondrial and nuclear genetic data suggest that Southern Residents interbreed with other orcas rarely, if at all (NMFS 2006).

4.5.2 Status

The Southern Resident population is more subject to anthropogenic influences than any other population. For example, levels of toxic chemicals in Southern Residents are three times higher than levels known to cause immunotoxicity in harbor seals (*Phoca vitulina*). Organochlorine concentrations are four times higher than reported for the Northern Resident population. It is also possible that the large and growing commercial and recreational whale-watching industry on the West Coast may be having an impact, although specific impacts are unclear. The Southern Residents are also subject to significantly higher levels of vessel interactions because their summer range lies close to large urban areas (Seattle, Victoria, and Vancouver). Human interactions include live-capture fisheries, entanglement in fishing gear, collisions with vessels, and exposure to oil spills.

4.5.3 Presence in the Action Area

The *Southern Resident Killer Whale Sighting Compilation, 1990-2008* (Osborne 2008) includes the average number of orca sightings in Puget Sound per month over an 18-year period. The compilation divides Puget Sound into quadrants and gives sighting data for each quadrant. The results of this data indicate that Southern Resident Killer Whales are much more strongly associated with the north side of the Strait adjacent to Vancouver Island in all months of the year. However, Southern Resident orca are frequently present in the strait, and are occasionally seen within the waters of Neah Bay (personal communication with Jon Scordino, Makah Tribal

marine mammal biologist). However, Neah Bay provides very little suitable habitat for orcas, and orcas are not expected to be present within the waters of Neah Bay with any regularity.

4.6 Humpback Whale (*Megaptera novaeangliae*)

The humpback whale was listed as an endangered species under the ESA in 1970. Critical habitat has been neither designated nor proposed for humpback whale. For the purposes of the MMPA stock, humpback whales that feed off the West Coast are defined as comprising the Eastern North Pacific Stock. The winter migratory destination of this stock is primarily in coastal waters of Mexico and Central America (NMFS 2010).

4.6.1 Distribution and Habitat Requirements

Humpback whales range from California to the Chukchi Sea, Hawaii, and the Mariana Islands (NMFS 1991). During summer, humpback whales in the North Pacific migrate and feed over the continental shelf and along the coasts of the Pacific Rim. Humpback whales winter in three separate wintering grounds: (1) the coastal waters along Baja California and the mainland of Mexico; (2) the main islands of Hawaii; and (3) the islands south of Japan (NMFS 1991).

Humpback whales inhabit waters over continental shelves, along their edges, and around some oceanic islands. During winter, they usually are found in tropical or temperate waters. During the summer, most migrate considerable distances to waters with higher biological productivity, typically at higher latitudes (City of Seattle 2007).

4.6.2 Status

The California/Oregon/Washington humpbacks are listed as endangered throughout their entire range. The estimated population of this stock remains much lower than the population size before whaling. Primary threats to the population include habitat impacts, boat strikes, whale-watch harassment, net entanglement, and harvest (NMFS 2015).

4.6.3 Presence in the Action Area

Humpback whales have been observed within the action area outside of Neah Bay and are frequently observed in the Strait of Juan de Fuca during summer and fall. However, the waters of Neah Bay provide very little habitat suitability for humpback whales. Humpback whales, if present in the vicinity will be expected to occur only in the adjacent waters of the Strait of Juan de Fuca, and not within the waters of Neah Bay. For this reason, humpback whales are not expected to be present within the action area.

4.7 Puget Sound/Georgia Basin DPS Bocaccio (*Sebastes paucispinis*)

Georgia Basin DPS bocaccio were listed as a threatened species under the ESA in April 2010. Boccaccio, a species of rockfish, made up 8 to 9 percent of the commercial

catch in the Puget Sound in the 1970s. Adult bocaccio are difficult to age, but it is suspected that they live as long as 54 years (Drake et al. 2010). Critical habitat for this species was designated in November 2014, but does not include the waters of Neah Bay. The designation includes specifically designated areas of deep water and nearshore habitat throughout Puget Sound and the Georgia Basin. The designation within the Strait of Juan de Fuca does not extend westward beyond Green Point, which is approximately 70 miles east of the action area, east of Port Angeles.

4.7.1 Distribution and Habitat Requirements

The range of bocaccio extends from Baja California to the Gulf of Alaska, and within this range, they are most common between Oregon and northern Baja California (Love et al. 2002). They are most frequently found in water depths between 160 and 820 feet, but may be found as deep as 1,560 feet (Orr et al. 2000). Copulation and fertilization occur in the fall, generally between August and November. Larvae and juvenile bocaccio may remain pelagic for 3-1/2 to 5-1/2 months, often associated with floating kelp mats, before settling to deeper water habitats. While generally associated with hard substrates, adults occasionally are found in mudflat habitat. While primarily bottom dwellers, bocaccio can be found as much as 30 feet off the sea floor (Love et al. 2002).

4.7.2 Status

Georgia Basin DPS bocaccio has been deemed to be at high risk of extinction throughout all of its range by the NMFS Biological Review Team (BRT) reviewing the petition for listing. Once comprising nearly 5 percent of the total rockfish catch, there have been no confirmed observations of bocaccio in the Georgia Basin in approximately seven years. Primary threats to Georgia Basin DPS bocaccio identified by the BRT include areas of low dissolved oxygen within their range, potential for continued bycatch from recreational and commercial harvest, and a reduction in kelp habitat necessary for juvenile recruitment.

4.7.3 Presence in the Action Area

Adult Georgia Basin DPS bocaccio are not expected to occur within the action area. The Pacific coastal stock of bocaccio are more likely to be present in the vicinity than the Puget Sound/Georgia Basin stock based on the location of the bay near the Pacific coast. Federal management guidelines have listed the coastal stock of bocaccio as overfished, but the Pacific coastal stock are not listed under ESA (WDFW 2011).

Habitat conditions within the action area are only marginally suitable for rockfish species. Water depths within the action area are too shallow, and there is no high relief, deep-water habitat that would be preferred by adult rockfish. Juvenile or larval bocaccio could be present within the action area but habitat suitability for this species is limited. There are small patches of kelp in the intertidal nearshore mudflats, but there are no floating kelp beds, eelgrass, or other aquatic vegetation that would provide potentially suitable habitat for larval and juvenile rockfish.

4.8 Puget Sound/Georgia Basin DPS Yelloweye Rockfish (*Sebastes ruberrimus*)

Georgia Basin DPS yelloweye rockfish were listed as a threatened species under the ESA in April 2010. Georgia Basin DPS yelloweye rockfish have been deemed to be at moderate risk of extinction throughout all of its range by the NMFS BRT. In the north Puget Sound, the frequency of yelloweye rockfish decreased from greater than 3 percent of total rockfish catch in the 1970s to 0.65 percent in the most recent samples as of 2010 (Drake et al. 2010). Critical habitat for this species was designated in November 2014 (79 FR 68041), but does not include the waters of Neah Bay. The designation includes specifically designated areas of deep water and nearshore habitat throughout Puget Sound and the Georgia Basin. The designation within the Strait of Juan de Fuca does not extend westward beyond Green Point, which is approximately 70 miles east of the action area, east of Port Angeles.

4.8.1 Distribution and Habitat Requirements

Yelloweye rockfish range from Baja California to the Aleutian Islands, but are most common from central California north to the Gulf of Alaska (Clemens and Wilby, 1961; Eschmeyer et al. 1983; Hart 1973; Love 1996). They are among the largest of the rockfish, weighing up to 25 pounds (Love et al. 2002). Living as long as 118 years, they are also among the most long-lived rockfish (Love 1996). Yelloweye rockfish occur in waters between 80 to 1,560 feet deep but are most commonly found between 300 and 590 feet deep.

Neah Bay is considered a transitional area to the open coast of the Pacific Ocean and coastal rockfish stocks are expected to have a greater affinity for the action area than the Puget Sound/Georgia Basin stock. In Puget Sound, yelloweye rockfish are thought to spawn during the winter to summer months, giving birth from early spring to late summer. Yelloweye juveniles settle quickly to shallow, high relief areas. As they grow, they continue to move toward deeper water habitats and continue to associate with high relief areas (Carlson and Straty 1981; Love et al. 1991).

4.8.2 Status

Stock assessments have not been made for rockfishes occurring specifically in the Neah Bay area. The Pacific coastal stock of yelloweye rockfish is designated as overfished but not listed under ESA (WDFW 2011). Primary threats to Georgia Basin DPS yelloweye rockfish cited by the BRT in the proposed listing include low intrinsic productivity combined with continued threats of bycatch from commercial and recreational harvest, loss of nearshore habitat, chemical contamination, and areas of low dissolved oxygen.

4.8.3 Presence in the Action area

Adult Georgia Basin DPS yelloweye rockfish are not expected to occur within the action area. The Pacific coastal stock of yelloweye rockfish are more likely to be present in the vicinity than the Puget Sound/Georgia Basin stock based on the

location of the bay near the Pacific coast. Federal management guidelines have listed the coastal stock of yelloweye rockfish as overfished, but the Pacific coastal stock are not listed under ESA (WDFW 2011). The Georgia Basin DPS yelloweye are expected to be present primarily to the east of Sekiu River, though some rockfish from this DPS may possibly occur in Neah Bay.

Adult Georgia Basin DPS yelloweye rockfish are not expected to occur within the action area. Water depths within the action area are shallow, and no high relief, deep-water habitat occurs within the action area. Juvenile or larval yelloweye rockfish are also not likely to be present within the action area during the in-water work window, as most yelloweye give birth in spring, and juvenile yelloweye tend to move quickly to deep-water habitat. Juvenile yelloweye rockfish do not use nearshore habitat frequently and are most frequently found in association with floating kelp beds, and no floating kelp beds are found within the action area.

4.9 Puget Sound/Georgia Basin DPS Canary Rockfish (*Sebastes pinniger*)

Puget Sound/Georgia Basin DPS canary rockfish have been deemed to be at moderate risk of extinction throughout all of its range by the NMFS BRT. In Puget Sound proper, canary rockfish occurred at frequencies above 2 percent of total rockfish catch in the 1960s and 1970s, but by the late 1990s, had declined to about 0.76 percent. Critical habitat for this species was designated in November 2014 but does not include the waters of Neah Bay. The designation includes specifically designated areas of deep water and nearshore habitat throughout Puget Sound and the Georgia Basin. The designation within the Strait of Juan de Fuca does not extend westward beyond Green Point, which is approximately 70 miles east of the action area, east of Port Angeles.

4.9.1 Distribution and Habitat Requirements

Canary rockfish range between Baja California and the western Gulf of Alaska, and within this range are most common off the central coast of Oregon (Richardson and Laroche 1979). Canary rockfish primarily inhabit waters 160 to 820 feet deep but may be found at up to 1,400 feet deep. They can live to be up to 84 years old, and were once considered fairly common in the greater Puget Sound area. Canary rockfish spawn once per year between September (at the southern end of the range) and December (Guillemot 1985), with birth occurring between September and March off the Oregon and Washington coasts, with peaks in December and January (Barss 1989; Wyllie-Echeverria 1987). Juvenile and adult canary rockfish tend to be associated with deep water and rocky and coarse habitats throughout the basins of Puget Sound (Miller and Borton 1980) and are broadly distributed throughout the Georgia Basin.

4.9.2 Status

Stock assessments have not been made for rockfishes occurring specifically in the Neah Bay area. The Pacific coastal stock of canary rockfish is designated as

overfished but not listed under ESA (WDFW 2011). Primary threats to Georgia Basin DPS canary rockfish cited by the BRT in the proposed listing include low intrinsic productivity combined with continued threats of bycatch from commercial and recreational harvest, loss of nearshore habitat, chemical contamination, and areas of low dissolved oxygen.

4.9.3 Presence in the Action Area

Adult Georgia Basin DPS canary rockfish are not expected to occur within the action area. The Pacific coastal stock of canary rockfish are more likely to be present in the vicinity than the Puget Sound/Georgia Basin stock based on the location of the bay near the Pacific coast. Federal management guidelines have listed the coastal stock of canary rockfish as overfished, but the Pacific coastal stock are not listed under ESA (WDFW 2011). The Georgia Basin DPS canary are expected to be present primarily to the east of Sekiu River, though it is possible that some rockfish from this DPS may occur in Neah Bay.

Adult Georgia Bain DPS canary rockfish are not expected to occur within the action area. Water depths within the action area are shallow, and no high relief, deep-water habitat occurs within the action area. Juvenile or larval canary rockfish could be present within the action area, but habitat suitability for this species is limited. There are small patches of kelp in the intertidal nearshore mudflats, but there are no floating kelp beds, eelgrass, or other aquatic vegetation that would provide potentially suitable habitat for larval and juvenile rockfish.

4.10 Pacific Eulachon (*Thaleichthys pacificus*)

The Southern DPS of Pacific eulachon was listed as threatened on 18 March 2010 (75 FR 13012). Critical habitat was designated for the species in 2011 (76 FR 65323) and a notice of intent to prepare a recovery plan for Pacific eulachon was listed in July 2013 (78 FR 40104). The nearest known critical habitat is located in the Elwha River, approximately 60 miles east of Neah Bay.

4.10.1 Distribution and Habitat Requirements

Pacific eulachon are endemic to the eastern Pacific Ocean ranging from northern California to southwest Alaska and into the southeastern Bering Sea. Eulachon typically spend three to five years in saltwater before returning to freshwater to spawn from late winter through early summer. Spawning grounds are typically in the lower reaches of larger rivers fed by snowmelt.

4.10.2 Status

Key threats to eulachon are overfishing in subsistence and commercial fisheries; continued/increased bycatch in commercial groundfish and shrimp fisheries; industry pollution of freshwater and marine habitats; human impact on spawning habitat through logging, dredging, and diversions; and climate change (Hay and McCarter 2000).

4.10.3 Presence in the Action Area

According to NMFS (76 FR 515), most Pacific eulachon production for the southern DPS occurs in the Columbia River basin. There are no documented eulachon spawning sites in the Puget Sound. The closest documented eulachon spawning site or migration corridor is the Elwha River on the Olympic Peninsula (NMFS 2010). Other Olympic Peninsula rivers that drain into the Strait of Juan de Fuca have been extensively surveyed for many years for the presence of salmonid species, and eulachon have not been observed (BRT 2010).

Pacific eulachon have not been documented within Neah Bay and are not documented or expected to occur within the action area.

4.11 Marbled Murrelet (*Brachyramphus marmoratus*)

The marbled murrelet was listed as threatened in the states of California, Oregon, and Washington under the ESA on 28 September 1992 (57 FR 45328). Critical habitat was designated on 24 June 1996 (61 FR 26256). In 2011, critical habitat for marbled murrelet was revised by removing approximately 189,671 acres in northern California and southern Oregon from the 1996 designation (76 FR 61611). The nearest designated critical habitat unit is located approximately 2 miles south of the action area in Clallam County, Washington (USFWS 1996).

4.11.1 Distribution and Habitat Requirements

Marbled murrelet is a small sea bird that feeds primarily on fish and invertebrates in nearshore marine waters (City of Seattle 2007). Marbled murrelets nest in mature stands of coastal forest, typically closely associated with the marine environment, though murrelets have been documented in forested stands at distances of up to 50 miles inland in Washington (Hamer and Nelson 1995). Marbled murrelets require forests with large trees (greater than 30-inch diameter at breast height), multi-storied stands, and moderate canopy closure. Murrelets tend to nest in the largest trees in the stand (City of Seattle 2007).

4.11.2 Status

The primary threat to marbled murrelet is the loss of suitable old-growth habitat adjacent to coastal foraging habitats. Key threats to marbled murrelet in the marine environment also include entanglement in nearshore fishing nets and pollution (City of Seattle 2007).

4.11.3 Presence in the Action Area

There is no documented nesting habitat for this species within the terrestrial portion of the action area. However, there is documented occupied marbled murrelet nesting habitat approximately 2 miles south of the action area, in forested habitat on the peninsula. Marbled murrelet are known to forage within the waters of Neah Bay within the action area (personal communication with Rob McCoy, Makah Tribal wildlife biologist). While sightings of marbled murrelets within Neah Bay are not uncommon, they are only occasionally present. Marbled murrelets were not

observed in Neah Bay during two-year-long surveys conducted in 1992 and 1993 (Chapman 1993). Marbled murrelet could potentially be present within the waters of the action area at any time of the year, but they are not expected to occur regularly.

4.12 Critical Habitat Designation for each ESU/DPS

This section describes the critical habitat designations and/or proposals for each ESA-listed species that could potentially occur within the action area.

4.12.1 Salmon and Steelhead

The proposed action does not occur within designated or proposed critical habitat for any ESU/DPS of ESA-listed salmon or steelhead. Critical habitat for Puget Sound Chinook Salmon was designated in 2005 and consists of river and marine nearshore habitat within the Puget Sound basin and on the Olympic Peninsula east of the Elwha River. Critical habitat for Hood Canal summer-run chum salmon was also designated in 2005 and consists of tributary and marine nearshore habitat within Hood Canal. Critical habitat was designated for Puget Sound DPS steelhead in 2016, and includes several freshwater streams and tributaries in Puget Sound, but does not include any nearshore marine habitat nor any tributaries west of the Elwha River.

4.12.2 Puget Sound DPS Bull Trout

The proposed action does not occur within designated habitat for Puget Sound DPS of bull trout. Critical habitat for Puget Sound bull trout was designated in 2010 and consists of river and near shore habitat along the Strait of Juan de Fuca east of the Pysht River. No designated Puget Sound bull trout critical habitat is present within the action area.

4.12.3 Puget Sound/Georgia Basin DPS Rockfish

The proposed action does not occur within the range of any designated critical habitat for bocaccio, yelloweye, or canary rockfish. Critical habitat was designated for these species in November 2014. The designation includes specifically designated areas of deep water and nearshore habitat throughout Puget Sound and the Georgia Basin. The designation within the Strait of Juan de Fuca does not extend westward beyond Green Point, which is approximately 70 miles east of the action area, east of Port Angeles.

4.12.4 Southern Resident DPS Orca

Critical habitat has been designated within the action area for the Southern Resident DPS of orcas that may occur within the action area. Table 6 summarizes critical habitat designations and descriptions for orca.

Table 6. Orca Critical Habitat Designation and Description

Species and ESU/DPS	Date of Critical Habitat Proposal	Description of Critical Habitat
Orca		
Southern Resident DPS	29 November 2006	Haro Strait and San Juan Islands, Puget Sound, and Strait of Juan de Fuca

4.12.4.1 Primary Constituent Elements of Designated Critical Habitat for Southern Resident DPS of Orcas

This section consists of a discussion of the primary constituent elements (PCEs) that have been identified for ESA-listed orcas, and the potential for their presence within the action area.

1. **Water quality to support growth and development.**
   Action area: While the action area likely provides sufficient water quality for orca growth and development, orca are not expected to occur with any regularity within the waters of Neah Bay that comprise the action area.

2. **Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth.**
   Action area: The Strait of Juan de Fuca provides suitable migratory habitat for Chinook salmon, which is the orca's primary prey species. Chinook salmon populations are a fraction of what they were historically; however, prey still appears to be of sufficient quantity, quality, and availability to support the growth, production, and development of the existing population of Southern Resident DPS orca. The waters of Neah Bay also provide potentially suitable migratory/foraging habitat for Chinook salmon, though orca are not known to forage extensively within Neah Bay.

3. **Passage conditions to allow for migration, resting, and foraging. NMFS is gathering data to assist it in evaluating sound as a potential PCE.**
   Action area: The Strait of Juan de Fuca provides high-quality migrating, resting, and foraging habitat for Southern Resident orca. Orca typically use the northern half of the Strait adjacent to Vancouver Island much more heavily than the southern half along the Washington shoreline (Osborne 2008). The waters of Neah Bay do not represent suitable migration, resting, or foraging habitat for orca because of the relatively shallow water depths, the enclosed nature of the Bay and breakwaters, and the high level of human activity.

5.0 ENVIRONMENTAL BASELINE

This section outlines the presence and condition of aquatic and terrestrial habitat features within the action area as they pertain to the species addressed in this biological evaluation. The following sections summarize the baseline habitat conditions at both the action area and watershed scales, and then analyze the likely effects that the proposed action would have on the baseline conditions at both scales.

5.1 General Setting

The proposed activities will occur on Makah Indian tribal land in Neah Bay, Washington (Sheet 1). The project site is within WRIA 19, Lyre-Hoko Basin, and is located within Hydrologic Unit Code 17110021.

The predominant land uses at the project site and within the action area are generally fishing and boating related. The existing dock is used as a commercial fishing dock for both tribal and non-tribal fishing operations, including loading ice, materials, and equipment to the outgoing boats, and unloading and ice-packing fish from incoming boats for transport to Seattle and elsewhere. The Makah Marina and a small pier are located approximately 200 feet east of the dock. Additional docks are located approximately 800 feet west of the project site. The upland property to the south of the project site is bounded by Bayview Avenue and various commercial/residential buildings.

The shoreline of Neah Bay has been altered from its natural conditions over the past 150 years. The establishment of the Makah Reservation (after the signing of an 1855 treaty with the United States) resulted in the construction of the town to include roads and buildings along the shore of the bay.

5.2 Terrestrial Habitat

There is little to no natural terrestrial habitat at the site of the proposed activities. The upland adjacent to the project site is a gravel parking and equipment storage area. The shoreline at the project site is protected with rock riprap extending to the top of the shoreline on both sides of the dock. Upland vegetation along the shoreline is limited to a narrow band of vegetation at the top of the riprapped slope, which consists primarily of Himalayan blackberry (*Rubus armeniacus*). A few small-diameter red alder (*Alnus rubra*), and low-growing red-osier dogwood (*Cornus sericea*) are also present.

5.3 Aquatic Habitat

An evaluation of the baseline watershed and in-stream habitat conditions within the action area was conducted according to the guidance outlined in *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). The evaluation assessed several baseline indicators of habitat quality and determined whether the proposed action would restore, maintain, or

degrade existing baseline conditions at the watershed and action area level. Tables 7 and 8 show the results of this analysis.

In general, the environmental baseline conditions within the action area are somewhat degraded. As indicated in Tables 7 and 8, most of the indicators of environmental condition are not properly functioning, or are functioning at risk, at both the watershed and action area scales. Sediment transport within the bay has been significantly altered by the construction of breakwaters, which has affected the natural hydraulic processes in the bay. Aquatic vegetation is largely lacking at the site. There are some small areas of kelp growing in the intertidal area below the riprapped slope, but there is no eelgrass or any other significant aquatic vegetation at the project site.

Table 7. Overview of Environmental Baseline Conditions at Action Area and Watershed Scales

Diagnostic/Pathway Indicators	Baseline Environmental Conditions		Effects of Project Activities	
	Action Area	Watershed	Action Area	Watershed
Water Quality				
Temperature	FR	FR	Maintain	Maintain
Sediment/Turbidity	NPF	NPF	Temporarily Degrade	Maintain
Chemical Contamination/ Nutrients	PF	PF	Maintain	Maintain
Habitat Access				
Physical Barriers	PF	FR	Maintain	Maintain
Habitat Elements				
Substrate	NPF	PF	Improve	Maintain
Large Woody Debris	NPF	FR	Maintain	Maintain
Pool Frequency	N/A	NPF	N/A	Maintain
Pool Quality	N/A	NPF	N/A	Maintain
Off-Channel Habitat	NPF	NPF	Maintain	Maintain
Refugia	NPF	FR	Maintain	Maintain
Channel Conditions/Dynamics				
Width/Depth Ratio	NPF	NPF	Maintain	Maintain
Streambank Condition	NPF	NPF	Maintain	Maintain
Floodplain Connectivity	NPF	NPF	Maintain	Maintain
Flow/Hydrology				
Change in Peak/Base Flows	PF	PF	Maintain	Maintain
Increase in Drainage Network	FR	FR	Maintain	Maintain
Watershed Conditions				
Road Density and Location	NPF	NPF	Maintain	Maintain
Disturbance History	NPF	NPF	Temporarily Degrade	Maintain
Riparian Reserves	NPF	NPF	Maintain	Maintain

*NPF-Not properly functioning; **PF=Properly functioning; ***FR=Functioning at risk

Table 8. Overview of Environmental Baseline Conditions Specific to Bull Trout at Action Area and Watershed Scales

Diagnostic/Pathway Indicators	Effects of Project Activities	
	Action Area	Watershed
Subpopulation Characteristics within Subpopulation Watersheds		
Subpopulation Size	Maintain	Maintain
Growth and Survival	Maintain	Maintain
Life History Diversity and Isolation	Maintain	Maintain
Persistence and Genetic Integrity	Maintain	Maintain
Integration of Species and Habitat Conditions	Maintain	Maintain

6.0 MATRIX OF PATHWAYS AND INDICATORS ANALYSIS

6.1 Water Quality

6.1.1 Water Temperature

Village, Halfway and Agency Creeks, which flow into Neah Bay to the west and east of the project site, are not identified on the Ecology 2012 303(d) list for any parameter. While the relative lack of riparian vegetation may affect water temperatures within the action area to some extent, water temperatures are not typically elevated in large tidal systems, such as the Strait of Juan de Fuca and Neah Bay. Baseline conditions at both the action area and watershed scales, therefore, are determined to be **functioning at risk**.

The proposed action will **maintain** this indicator at both the action area and watershed scales. The project will not result in any change in the composition of riparian vegetation or riparian habitat structure within the action area, nor will it result in any measurable effect on water temperatures.

6.1.2 Sediment/Turbidity

Sediments within the portion of Neah Bay within the action area are predominantly fine-grained. Both Village and Agency Creeks have been heavily modified near their mouths and in their lower reach by bank armoring, residential development, and fill (Point No Point Treaty Council 2006). Additionally, construction of the breakwaters that form the bay have disrupted natural sediment transport within the bay significantly. Within the action area and the watershed, baseline conditions for sediment and turbidity are determined to be **not properly functioning**.

The proposed action may **temporarily degrade** this indicator, but will **maintain** it at both the action area and watershed scales in the long term. The proposed action has the potential to increase sediment and turbidity temporarily within the action area during pile driving and dredging activities, but the BMPs proposed will be sufficient to ensure no long-term impacts on sediment or turbidity within either the action area or Neah Bay.

6.1.3 Chemical Contamination/Nutrients

Water quality is relatively high within Neah Bay. There are few agricultural or industrial sources of pollution in upstream watersheds, and little opportunity for chemical or nutrient contamination. Western Neah Bay is on the approved 2012 EPA 303(d) list for bacteria (Ecology 2012), but there are no other reaches in the action area or vicinity listed for elevated levels of chemical contamination or nutrients. Within the action area and watershed, baseline conditions for chemical and nutrient contamination are determined to be **properly functioning**.

The proposed action will **maintain** this indicator at action area scale and maintain it at the watershed scale. The proposed construction activities will not impact water quality at the site or in Neah Bay as BMPs will be in place to minimize and prevent impacts to the water from spills or releases.

6.2 Habitat Access

6.2.1 Physical Barriers

There are no barriers to fish migration within the marine portion of the action area. For this reason, within the action area, baseline conditions for physical barriers are determined to be **properly functioning**. At the watershed scale, barriers to anadromous fish migration are present in other creeks, including significant impediments to fish passage in Sail River and Snow Creek, east of Agency Creek (Smith 1999). Approximately 4 acres of wetland and 3/4 mile of stream access is blocked to coho, steelhead, and cutthroat by a culvert in Agency Creek. A culvert blocks 1/3 mile of coho, steelhead, and cutthroat habitat in Village Creek. Nevertheless, fish passage conditions are adequate in most watershed tributaries to provide access to most species of anadromous salmonids. Within Neah Bay, baseline conditions for physical barriers are determined to be **functioning at risk**.

The proposed action will **maintain** this indicator at both the action area and watershed scales. The proposed pile-driving activities will not pose a significant barrier to fish passage at any range of flow at either the action area scale or the watershed scale.

6.3 Habitat Elements

6.3.1 Substrate

Sedimentation within the watershed has altered the substrate deposition and transport mechanisms within the portion of Neah Bay that is within the action area. Sediments within the action area are predominantly fine-grained silt and sands, and no substrate is present that is adequate for salmonid spawning. Within the action area, therefore, baseline conditions for substrate are determined to be **not properly functioning**. In most tributaries within the watershed, substrates are likely adequate for salmonid spawning, and conditions are considered to be **properly functioning**.

The proposed action will **maintain** this indicator at both the action area and watershed scales in the long term. The processes of pile driving and dredging have the potential to increase sediment and turbidity temporarily within the action area, but this short-term effect will not result in a measurable effect on substrate embeddedness within the action area. The proposed action will have no measurable long-term impacts on substrate at either the action area or the watershed scales.

6.3.2 Large Woody Debris

Little large woody debris (LWD) occurs within the action area. The action area has limited vegetation or habitat. Within the action area, therefore, baseline conditions for LWD are determined to be **not properly functioning**. Riparian conditions and LWD levels have been impacted in nearshore areas surrounding Neah Bay, though some opportunity remains for recruitment. Within the watershed, baseline conditions for LWD are determined to be **functioning at risk**.

The proposed action will **maintain** this indicator at the action area scale and **maintain** it at the watershed scale in the long term. The proposed action will not result in any impacts to riparian vegetation or habitat and will not affect the opportunity for future recruitment.

6.3.3 Pool Frequency

The action area is a marine embayment, and there is no pool habitat in the action area. This indicator is not applicable

6.3.4 Pool Quality

For the same reasons as pool frequency, pool quality is lacking within the action area and throughout the watershed. This indicator is not applicable.

6.3.5 Off-Channel Habitat

There is no off-channel habitat within the action area. Baseline conditions for off-channel habitat are **not properly functioning** within the action area. At the watershed scale, surface connectivity from creeks and rivers with off-channel habitats has decreased with the history of development and the logging industry in the basin, and baseline conditions for off-channel habitat are also determined to be **not properly functioning**.

The proposed action will **maintain** this indicator at the action area scale and at the watershed scale. The proposed action will not result in any impacts to off-channel habitat at either the watershed or the action area scale.

6.3.6 Refugia

The shoreline of Neah Bay within the action area consists of hardened and armored shoreline. Little to no native riparian vegetation exists along the shoreline. Upland vegetation along the shoreline is limited to a narrow band of vegetation at the top of the riprapped slope, which consists primarily of Himalayan blackberry (*Rubus*

armeniacus). A few small-diameter red alder (*Alnus rubra*), and low-growing red-osier dogwood (*Cornus sericea*) are also present. There are no side channels present within the action area. Baseline conditions for refugia within the action area are **not properly functioning**. At the watershed scale, areas of refugia are similarly lacking, though there are areas of functional off-channel habitat that provide refugia for sensitive aquatic species. For this reason, baseline conditions for refugia at the scale of the project's shipping prism are determined to be **functioning at risk**.

The proposed action will **maintain** this indicator at both the action area and watershed scales. The proposed action will not result in any impacts to the quality or quantity of refugia at either the watershed or action area scale.

6.4 Channel Conditions and Dynamics

6.4.1 Width/Depth Ratio

The width/depth ratio of Neah Bay is likely in excess of the ratio required for proper functioning condition, though this indicator is geared towards freshwater riverine systems and does not likely apply to marine systems. This indicator is **not properly functioning** at the action area and watershed scales.

The proposed action will **maintain** this indicator at both the action area and watershed scales in the long term. The proposed action will not result in any impacts to the channel width/depth ratio at either the watershed or action area scale.

6.4.2 Streambank Condition

Within the action area, the streambank condition along Neah Bay is determined to be **not properly functioning**. The shoreline at the project site is protected with rock riprap extending to the top of the shoreline on both sides of the dock. Upland vegetation along the shoreline is limited to a narrow band of vegetation at the top of the riprapped slope, which consists primarily of Himalayan blackberry. A few small-diameter red alder and low-growing red-osier dogwood are also present. Within the greater watershed, the streambank condition is also determined to be **not properly functioning** because of channel instability throughout the system.

The proposed action will **maintain** this indicator at both the action area and watershed scales in the long term. The proposed action will not result in any impacts to streambank stability either within the action area or at the watershed scale.

6.4.3 Floodplain Connectivity

There is little natural floodplain habitat within the action area. Historic development, breakwater construction, and shoreline armoring have led to a condition where most of the terrestrial portion of the action area is completely removed from any floodplain. Conditions are similar throughout the watershed. Therefore, within the action area and at the watershed scale, floodplain connectivity is determined to be **not properly functioning**.

The proposed action will **maintain** this indicator at both the action area and watershed scales in the long term. The proposed action will not result in any impacts to floodplain connectivity within the action area or at the watershed scale.

6.5 Flow/Hydrology

6.5.1 Change in Peak/Base Flows

Neah Bay likely suffers from somewhat impaired runoff conditions because of the relative lack of riparian vegetation compared to the natural condition. However, peak and base flow conditions within the bay are largely the product of tidal conditions, and are not likely affected significantly by surface water contributions. Peak and base flows within the action area and at the watershed scale are determined to be **properly functioning**.

The proposed action will **maintain** this indicator at both the action area and watershed scales in the long term. The proposed action will not result in any impacts to base or peak flows either within the action area or at the watershed scale.

6.5.2 Increase in Drainage Network

Although no specific studies were found regarding the amount of increase in the drainage network, development along the shoreline and within formerly forested riparian habitat has resulted in at least a moderate increase in the drainage network at both the action area and watershed scales. The drainage network at both the action area and watershed scales is, therefore, determined to be **functioning at risk**.

The proposed action will **maintain** this indicator at both the action area and watershed scales in the long term. The proposed action will not create any increases to the drainage network.

6.6 Watershed Conditions

6.6.1 Road Density and Location

There are roads and paved surfaces throughout the upland portions of the action area, and these paved surfaces extend to the top of the riprap bank in several places. The road density is, therefore, assumed to be **not properly functioning**. While no specific data is available for reference, it is evident through informal assessment that the density of roads throughout the greater watershed is moderate, and that many of the existing roads are located in valley bottoms and drainages. The indicator for road density and location at the watershed scale is also, therefore, **not properly functioning**.

The proposed action will **maintain** this indicator at both the action area and watershed scales in the long term. The proposed action will not result in any impacts to road density or location either within the action area or at the watershed scale.

6.6.2 Disturbance History

Disturbance levels within the action area and at the watershed scale are above the threshold for proper functioning. Most of the upland portion of the project site is existing impervious surface, and riparian vegetation has been extensively cleared throughout the terrestrial portion of the action area. At the watershed scale, historic development, logging activity, and road construction has significantly affected the condition of the natural environment. The indicator for disturbance history within the action area and at a watershed scale is **not properly functioning**.

The proposed action will **temporarily degrade** this indicator at the action area scale. The dredging at the site will temporarily increase disturbance at the site. The project activities will result in permanent benthic impacts from pile installation and temporary benthic impacts from dredging. The proposed project will fully offset any potential effects to habitat function through the proposed impact minimization and mitigation activities. This indicator will be **maintained** at the watershed scale in the long term. The proposed action will not result in any significant amount of new disturbance at the watershed scale. The project proposes only minor amounts of new habitat disturbance, and will fully offset any

6.6.3 Riparian Reserves

The riparian reserve system within the action area and watershed scale is **not properly functioning**. There is minimal native riparian vegetation at the project site. Much of the riparian habitat has been replaced with a hardened riprap shoreline embankment. Within the project vicinity, there are several small patches of forested riparian habitat and natural streambank habitats, but these exist as remnant patches which are isolated from other riparian habitats.

The proposed action will **maintain** this indicator at both the action area and watershed scales in the long term. The proposed action does not propose any new riparian disturbance, and will not affect the quality or quantity of riparian reserves at either the action area or the watershed scale.

6.7 Pathways and Indicators Specific to Bull Trout Only

The USFWS provides a matrix of pathways and indicators specific to bull trout. The proposed action will not affect these indicators significantly; therefore, they are not addressed in detail here. The specific indicators are

- Subpopulation size
- Growth and survival
- Life history diversity and isolation
- Persistence and genetic integrity
- Integration of species and habitat conditions

The proposed action will **maintain** all of these indicators at both the action area and watershed scales in the long term. It is possible that bull trout migrating in Neah Bay

may be present when in-water work is being conducted, but bull trout are likely not present within the action area for significant periods. There is little or no suitable bull trout rearing or foraging habitat within the action area, and they are not known to be frequently present within Neah Bay. The proposed action will have no measurable effect on any of the indicators of proper functioning conditions for bull trout habitat.

7.0 EFFECTS OF THE ACTION

7.1 Direct Effects

Direct effects are the direct or immediate impacts of the proposed action to federally listed species and their habitat. This section addresses potential direct effects that listed species and critical habitats could experience as a result of the proposed action and the likely response to each potential direct effect.

7.1.1 Water Quality

Increased levels of sedimentation and turbidity could result from any sediment-disturbing activities. Pile installation and debris removal activities could disturb sediments and temporarily increase turbidity within the action area. Dredging will temporarily increase turbidity during that portion of the project. Increased levels of sedimentation and turbidity could have temporary negative impacts on habitat for listed fish species and, if any listed fish species are present within the action area during the time of construction, could affect them directly.

Natural tidal currents and flow patterns in Neah Bay routinely disturb sediments. High-volume tidal events can result in hydraulic forces that resuspend benthic sediments, temporarily elevating turbidity locally. Any temporary increase in turbidity as a result of the proposed action is not anticipated to measurably exceed levels caused by these normal, natural periodic increases.

With over-water work, there is the potential for construction debris to enter the waterway. There is also slight potential for leaks and spills of fuel, hydraulic fluids, lubricants, and other chemicals from equipment and storage containers associated with the project. Discharge of vehicle and equipment wash water, etc., could also add pollutants that could enter the water.

The contractor will be required to provide and implement impact minimization measures and BMPs, including the preparation of an SPCC plan (see Section 3.3 above). As part of this plan, a floating containment boom will be deployed during project implementation, which will contain any debris that enters the waterway during construction activities. Additional BMPs have been included to avoid any potential impacts from hazardous materials. These BMPs include inspecting construction equipment daily to ensure that there are no leaks of hydraulic fluids, fuel, lubricants, or other petroleum products and locating temporary material and

equipment staging areas above the mean higher high water (MHHW) of the action area waterbody and outside environmentally sensitive areas.

The following ESA-listed species and designated critical habitat have the potential to be exposed to the direct effects of temporarily decreased water quality conditions that could occur within the action area during project construction.

- Puget Sound ESU Chinook salmon
- Hood canal summer-run chum salmon
- Puget Sound DPS steelhead
- Puget Sound DPS bull trout
- Georgia Basin DPS bocaccio rockfish
- Georgia Basin DPS yelloweye rockfish
- Georgia Basin DPS canary rockfish
- Orca
- Marbled murrelet
- Designated critical habitat for Puget Sound DPS orca

During the in-water work period, foraging juveniles and migrating adult salmon and steelhead could be present within the action area. Juvenile rockfish and marbled murrelet could also be present within the action area during this time frame, though their presence is unlikely. These species, if present during construction, would likely be feeding and would not be present within the action area for any significant period.

Bull trout, humpback whale, and Pacific eulachon are not expected to be present within the waters of the action area during the time that in-water work is being conducted, and would not be exposed to any effects associated with temporarily decreased water quality conditions.

It is possible that migrating adult and/or rearing juvenile salmon, steelhead, and bull trout, as well as juvenile rockfish, orca, and marbled murrelet, could be present within the action area and could be exposed to temporarily decreased water quality conditions, including temporarily elevated turbidity levels and/or potential debris contamination. The geographic extent and duration of any potential short-term decreases in water quality conditions are expected to be limited, and the BMPs implemented for the proposed action (including the implementation of an SPCC plan) will be sufficient to minimize any effects.

The action area has been designated as critical habitat for Southern Resident DPS orcas.

The action area provides suitable "prey species" PCE of critical habitat for Southern Resident orca, as the action area does provide potentially suitable migratory habitat for Chinook salmon. Designated orca critical habitat within the action area may

experience temporarily increased levels of turbidity during impact pile proofing and installation. The geographic extent and duration of any potential short-term increases in sedimentation or turbidity due to project activities are expected to be limited, and are not expected to exceed baseline sedimentation conditions measurably. Any temporarily elevated sedimentation levels will not result in any significant effect to designated or proposed critical habitats. The SPCC plan and other BMPs implemented as part of this proposed action will be sufficient to ensure that any potential water quality impacts will not result in any adverse effects to any designated critical habitats.

7.1.2 Noise

The project will require the installation of approximately 220 18- and 24-inch-diameter steel pipe piles below the MHHW of Neah Bay. The project will also require the installation of approximately 20 temporary piles (also likely 18- and 24-inch-diameter steel pipe piles) for construction of a temporary work platform. Pile driving will be completed using a vibratory hammer to drive all of the piles to the extent practicable. If necessary, following vibratory driving to refusal (the point at which the pile will no longer advance with the vibratory hammer), the project will use an impact hammer to drive piles to their final tip elevations. An impact hammer will also be needed to proof the structural piles (although proofing is not necessary where final tip elevation is achieved using an impact hammer). Proofing is the process of striking piles with an impact hammer to verify their load-bearing capacity.

The proposed action has been designed to minimize the likelihood of any impacts resulting from pile installation activities. The project will implement a bubble curtain or similarly effective noise attenuation device during all impact pile installation. These devices, when installed and operated properly, typically provide at least 5 dB of noise attenuation (Caltrans 2012). However, in order to make a conservative estimate of the extent of underwater noise for purposes of this consultation, no attenuation has been factored into the noise analysis for this project.

In addition, all pile installation will be conducted within the approved in-water work window for marine waters of Puget Sound where bull trout are present (16 July to 15 February). The in-water work period avoids the peak run timing for migrating adult and rearing juvenile salmon, steelhead, and bull trout.

Impact pile installation of 18- and 24-inch-diameter piles has the potential to generate temporary underwater noise levels of up to 207 dB_{PEAK}, 194 dB_{RMS}, and 178 dB_{SEL} (Caltrans 2012). Because geotechnical investigation has not yet been completed for the project, it is not possible to accurately determine how many piles, if any, may need supplemental impact driving to reach final tip elevation. For this reason, a conservative estimate has been made that up to 1,000 strikes per day may be necessary to impact drive piles to their final tip elevation.

The following ESA-listed species and designated critical habitats have the potential to be exposed to direct effects of temporarily increased noise levels because of their potential or documented presence within the action area during the anticipated in-water work period.

- Puget Sound ESU Chinook salmon
- Hood canal summer-run chum salmon
- Puget Sound DPS steelhead
- Puget Sound DPS bull trout
- Georgia Basin DPS bocaccio rockfish
- Georgia Basin DPS yelloweye rockfish
- Georgia Basin DPS canary rockfish
- Marbled murrelet
- Designated critical habitat for Puget Sound DPS orca

Humpback whale, orca, and Pacific eulachon are not expected to be present within the waters of the action area during the time that in-water work is being conducted, and would not be exposed to any effects associated with temporarily increased terrestrial and underwater noise levels.

Salmon, Steelhead, and Bull Trout – During the in-water work period, it is possible that adults and/or juveniles of Puget Sound ESU Chinook salmon, Hood Canal summer-run chum salmon, Puget Sound DPS steelhead, and Coastal-Puget Sound DPS bull trout could potentially be present within the action area. Although run timing within the action area is different for each ESU/DPS, it is possible that some individuals could be present within the action area, and could potentially be exposed to temporarily elevated underwater noise levels resulting from impact pile driving.

The noise attenuation analysis conducted for this project indicates that the peak underwater noise level generated during impact pile driving is estimated to not exceed 207 dB at 10 meters (33 feet), which could potentially exceed the peak injury threshold of 206 dB_{RMS} for ESA-listed fish out to a distance of approximately 36 feet. The bubble curtain that will be employed is expected to reduce this distance to the point that ESA-listed salmonids are unlikely to be exposed to any single strike peak sound pressure levels that exceed the injury threshold.

The worst-case estimate of up to 1,000 strikes per day that may be necessary to proof the 18- and 24-inch steel piles will result in exceedances of the cumulative underwater noise injury thresholds for fish greater than 2 grams (187 dB_{RMS}) and for fish less than 2 grams (183 dB_{RMS}) within approximately 708 feet and 1,312 feet of pile-driving activity, respectively. Given the nature and anticipated level of use of the habitat, however, most fish are expected to be moving through the portion of the action area where the cumulative injury threshold could potentially be temporarily

exceeded. For this reason, ESA-listed fish are not expected to be exposed to the sound from all 1,000 strikes in a given day and are, therefore, unlikely to be adversely affected by the underwater noise associated with proposed pile-driving activities.

The portion of the action area that could be affected by temporarily elevated underwater noise levels is not within the range of any designated or proposed critical habitat for any salmon, steelhead, or bull trout, and critical habitats for these species would be unaffected by noise associated with the proposed action.

Orca and Humpback Whale– NMFS has established underwater noise Level A injury thresholds for marine mammals based on functional hearing groups. Humpback whales are considered to be low-frequency cetaceans and orca are mid-frequency cetaceans. Table 9 represents the impact thresholds for these groups. Level B behavioral disruption thresholds are not specified by hearing group and are 160 dB for impact driving and 120 dB for vibratory driving.

Table 9. Summary of Marine Mammal Functional Hearing Groups and Underwater Noise Impact Injury Thresholds (Level A).

Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	219 dB_{pk} 183 dB_{Le}	199 dB_{pk}
Mid-Frequency (MF) Cetaceans	230 dB_{pk} 185 dB_{Le}	198 dB_{pk}

Source: NOAA 2016

dB_{pk} - peak noise level

dB_{Le} - cumulative noise level averaged over a 24-hr period

Noise levels during vibratory pile installation and removal are not expected to exceed the injury thresholds for either pinnipeds or cetaceans at any time. As discussed in the analysis contained in Section 2.6.2, 176 dB_{RMS} is a conservative estimate of the underwater sound levels likely to be produced during vibratory pile removal and installation. Continuous vibratory driving of piles (1-hour durations) could exceed Level A thresholds within 68.3 meters for humpbacks and 6.1 meters for orca (see Table 10).

Table 10. Summary of Level A Impact Threshold Distances During Vibratory Pile Driving

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	199	198	173	201	219
PTS Isopleth to Threshold (meters)	68.3	6.1	101.0	41.5	2.9

The 120 dB Level B harassment threshold (behavioral disruption during vibratory pile installation and removal) for pinnipeds and cetaceans could be exceeded throughout the full extent of the aquatic portion of the action area. This area is defined by the shape and configuration of the bay and the configuration of the intervening breakwaters that establish the boundaries of underwater sound propagation.

The Level A harassment (injury) threshold for underwater noise could be exceeded at a distance of 464 meters for humpback and 17 meters for orca (see Table 11) during impacts pile driving. This analysis does not factor in the use of a bubble curtain; therefore, the distance at which humpback and orca are subjected to these thresholds is expected to be less.

Table 11. Summary of Level A Impact Threshold Distances During Impact Pile Driving

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	183	185	155	185	203
PTS Isopleth to Threshold (meters)	463.5	16.5	552.1	248.1	18.1

The 160 dB Level B harassment threshold (behavioral disruption during impact pile driving) for underwater noise for both pinnipeds and cetaceans could be exceeded throughout the aquatic portion of the action area. ESA-listed marine mammals do not use the marine habitat within the action area extensively, and they are unlikely to be present during pile-driving activities. However, to reduce the potential that the proposed pile-driving activities could result in disturbance or harassment to any ESA-listed marine mammals within the action area, the action area will be monitored and maintained as the marine mammal buffer area in which pile installation and/or removal will not commence, or will be suspended temporarily, if any ESA-listed marine mammals are observed within the area of potential disturbance. An MMMP is included as Appendix D of this document.

Marbled Murrelet – The underwater threshold for barotrauma for marbled murrelet (208 dB_{SEL}) could be exceeded within approximately 30 feet, and the auditory injury threshold (202 dB_{SEL}) could be exceeded to a distance of approximately 72 feet during impact pile driving. Elevated underwater sound can also have masking effects for marbled murrelet, in which communication between birds is compromised. The distance in which masking effects could potentially occur, with impact installation of 24-inch steel piles, is approximately 138 feet.

No injury or disturbance thresholds have been established for marbled murrelet associated with vibratory pile driving, and marbled murrelets are not expected to be significantly affected by underwater or terrestrial noise associated with vibratory pile installation or removal activities.

Marbled murrelet are not expected to be present in significant numbers within Neah Bay during the in-water work period. However, to reduce the potential that the proposed pile-driving activities could result in disturbance or harassment to marbled murrelet, a marbled murrelet monitoring plan will be implemented. The plan is being prepared and will be provided to the USACE and to USFWS at least 30 days prior to any impact pile-driving activities. As part of the plan, the area in which masking effects could potentially occur (138 feet from each pile) will be monitored and maintained as a marbled murrelet buffer area in which pile installation and removal will not commence or will be suspended temporarily if any marbled murrelets are observed within the area of potential disturbance. This will ensure that no marbled murrelets are exposed to underwater noise levels that could result in adverse effects.

7.1.3 Direct Habitat Impacts

The proposed dock extension will result in a net increase of up to approximately 34,730 square feet of overwater shading associated with the size and configuration of the replacement structure. The proposed extension is located in subtidal habitat from -2 to -25 feet MLLW. The new piles that will be installed as part of the structure will impact approximately 688 square feet (0.016 acre) of benthic habitat. This has the potential to reduce overall aquatic habitat suitability by impacting benthic biotic communities and providing habitat for non-native or predatory fish species. Mitigation for the overwater coverage increase will be provided and will be detailed in a separate mitigation plan.

The following ESA-listed species have the potential to be exposed to the direct effects of shading and impacts to the aquatic biotic community.

- Puget Sound ESU Chinook salmon
- Hood canal summer-run chum salmon
- Puget Sound DPS steelhead
- Puget Sound DPS bull trout
- Georgia Basin DPS bocaccio rockfish
- Georgia Basin DPS yelloweye rockfish
- Georgia Basin DPS canary rockfish
- Marbled murrelet
- Designated critical habitat for Puget Sound DPS orca

Mitigation and impact minimization will consist of debris removal from the project area, and the creation and enhancement of intertidal habitat through the placement

of dredged material. Suitable dredged material will be placed near the northwest corner of Neah Bay. The removal of deleterious materials, such as creosote-treated timber piles, burned materials, tires, and metal debris, would generally improve water quality and sediment quality in the project area. Removal of this debris will provide access to benthic substrate for biological resources, allow improved light transmission to the substrate, and reduce benthic shading caused by large objects on the bottom. Therefore, removal of debris is anticipated to improve approximately 5,000 to 6,000 square feet (0.1 to 0.12 acre) of benthic habitat.

The portion of Neah Bay that comprises the project action area is within designated critical habitat for Southern Resident DPS orca. While orca do not likely use the action area for foraging, resting, or migration, the action area provides a suitable "food base" PCE of critical habitat for Southern Resident orca. Increased overwater coverage constructed for this project will be mitigated to offset potential shading impacts to the in-water habitat.

7.2 Indirect Effects

Indirect effects are defined as those effects that are caused by or result from the proposed action, which are later in time, but still reasonably certain to occur. The proposed action will not result in any appreciable increase in overall vessel use in the bay or any other indirect effects that could affect ESA-listed species.

7.3 Effects from Interdependent and Interrelated Actions

Interdependent actions are defined as those actions having no independent utility apart from the proposed action (50 CFR §402-02). Interdependent actions are typically "because of" the proposed action. Interrelated actions are defined as those actions that are part of a larger action and depend on the larger action for their justification (50 CFR §402-02). Interrelated actions are typically "associated with" the proposed action. The proposed action has no interdependent or interrelated actions that could affect ESA-listed species.

7.4 Effects Determinations for Listed Species and Designated Critical Habitat

Based on the description of the proposed action and the analysis provided in this document, Table 12 lists the effects determinations for ESA-listed species and species proposed for listing, while Table 13 shows the effects determinations for designated critical habitats. A summary description of how these effects determinations were reached for each species and critical habitat follows the tables.

Table 12. Effects Determinations Summary Table – Species

Species ESU/DPS	Federal Status	Effect Determination*
Chinook Salmon		
Puget Sound ESU	Threatened	NLTAA
Chum Salmon		
Hood Canal Summer-Run ESU	Threatened	NLTAA
Steelhead		

Species ESU/DPS	Federal Status	Effect Determination*
Puget Sound DPS	Threatened	NLTAA
Bull Trout		
Puget Sound DPS	Threatened	NLTAA
Orca		
Southern Resident DPS	Threatened	NLTAA
Humpback Whale		
Eastern North Pacific Stock	Endangered	NLTAA
Marbled Murrelet		
NA (no ESU/DPS designation)	Threatened	NLTAA
Rockfish		
Boccaccio	Endangered	NLTAA
Yelloweye Rockfish	Endangered	NLTAA
Canary Rockfish	Endangered	NLTAA
Pacific Eulachon		
Southern DPS	Threatened	NE

*LTAA = Likely to Adversely Affect; NLTAA = Not Likely to Adversely Affect; NE = No Effect

Table 13. Effects Determinations Summary Table- Critical Habitats

Species ESU/DPS	Critical Habitat Status	Effect Determination*
Chinook Salmon		
Puget Sound ESU	Designated	NE
Chum Salmon		
Hood Canal Summer-Run ESU	Designated	NE
Steelhead		
Puget Sound DPS	Designated	NE
Bull Trout		
Puget Sound DPS	Designated	NE
Orca		
Southern Resident DPS	Designated	NLTAA
Humpback Whale		
Eastern North Pacific Stock	Not Designated or Proposed	NA
Marbled Murrelet		
NA (no ESU/DPS designation)	Designated	NE
Rockfish		
Boccaccio	Designated	NE
Yelloweye Rockfish	Designated	NE
Canary Rockfish	Designated	NE
Pacific Eulachon		
Southern DPS	Designated	NE

*LTAA = Likely to Adversely Affect; NLTAA = Not Likely to Adversely Affect; NE = No Effect; NA = Not Applicable

7.4.1 Species

7.4.1.1 Puget Sound ESU Chinook Salmon, Hood Canal Summer-Run Chum Salmon, and Puget Sound Steelhead

The proposed action **"may affect, but is not likely to adversely affect"** Puget Sound ESU Chinook salmon, Hood Canal summer-run chum salmon, and Puget Sound steelhead. A **"may affect"** determination is warranted based on the following.

- The project will require work below the MHHW of a portion of Neah Bay that represents migratory habitat for adult and juvenile salmon and steelhead.
- The proposed action will conduct work below the MHHW of Neah Bay during the in-water work period, when salmon and/or steelhead could potentially be migrating or foraging in the bay.
- The project has the potential to result in temporarily impaired water quality within the action area, including temporarily elevated turbidity levels during dredging and pile installation.
- The proposed action will result in temporarily elevated underwater noise levels during vibratory and impact pile installation proofing.
- The proposed dock extension will result in an increase of approximately 34,730 square feet of overwater coverage, which could reduce overall aquatic habitat suitability by impacting benthic biotic communities and providing habitat for non-native or predatory fish species. The proposed extension will be located over subtidal habitat ranging from -2 to -25 feet MLLW. The new piles that will be installed as part of the structure will impact approximately 688 square feet (0.016 acre) of benthic habitat. Actions to mitigate the overwater coverage and habitat impact will be described in a separate mitigation plan.

A **"not likely to adversely affect"** determination is based on the following.

- Salmonid use of the action area is limited to moderate-quality foraging and migration habitat. No freshwater rearing or spawning habitat occurs within the action area. Even under normal, non-project conditions, migrating adult and juvenile salmonids likely move through the action area rapidly.
- BMPs included as part of this proposed action and as described in Section 2.5 will be sufficient to ensure that any temporary water quality or noise-related impacts will not result in any adverse effects to any ESA-listed salmon or steelhead.

7.4.1.2 Puget Sound DPS bull trout

The proposed action "**may affect, but is not likely to adversely affect**" Puget Sound DPS bull trout. A "**may affect**" determination is warranted based on the following.

- The project will require work below the MHHW of a portion of Neah Bay that represents migratory habitat for adult and juvenile salmon and steelhead.

- The proposed action will conduct work below the MHHW of Neah Bay during the in-water work period, when salmon and/or steelhead could potentially be migrating or foraging in the bay.

- The project has the potential to result in temporarily impaired water quality within the action area, including temporarily elevated turbidity levels during dredging and pile installation.

- The proposed action will result in temporarily elevated underwater noise levels during vibratory and impact pile installation.

- The proposed dock replacement will result in a net increase of approximately 34,730 square feet of overwater coverage. The proposed extension will be located over subtidal habitat ranging from -2 to -25 feet MLLW. The new piles that will be installed as part of the structure will impact approximately 688 square feet (0.016 acre) of benthic habitat. Actions to mitigate the additional coverage will be implemented and described in a separate mitigation plan to reduce potential impacts to overall aquatic habitat suitability.

A **"not likely to adversely affect"** determination is based on the following.

- Bull trout habitat within the action area is limited to low- to moderate-quality migration habitat. No freshwater rearing or spawning habitat occurs within the action area. Even under normal, non-project conditions, migrating adult and juvenile salmonids likely move through the action area rapidly.

- BMPs included as part of this proposed action and as described in Section 2.5 will be sufficient to ensure that any temporary water quality or noise-related impacts will not result in any adverse effects to any bull trout.

7.4.1.3 Southern Resident DPS orca

The proposed action **"may affect but is not likely to adversely affect**" Southern Resident DPS orca.

A "**may affect**" determination is warranted based on the following.

- The project will require some in-water work within a portion of Neah Bay that represents potential habitat for orca.

- The project has the potential to result in temporarily impaired water quality within the action area, including temporarily elevated turbidity levels during pile driving.

- The proposed action will result in temporarily elevated underwater noise levels during impact pile-driving activities.

A **"not likely to adversely affect"** determination is based on the following.

- While orcas are frequently present in the adjacent Strait, Neah Bay does not represent suitable habitat for orca.
- All in-water work associated with the proposed action will be conducted during the approved in-water work window for the project (16 July to 15 February), which has been established to minimize potential effects to listed species.
- A MMMP (Appendix D) will be implemented during all pile installation activities. Pile installation will not commence or will be suspended temporarily if any ESA-listed marine mammals are observed within the area that could be potentially affected.
- Given the condition and lack of habitat, the temporary water quality impacts, temporary noise impacts, and relatively small amount of new overwater shading, impacts from pile footprints will not result in any measurable effect on orca.

7.4.1.4 Humpback Whale (Eastern North Pacific Stock)

The proposed action "**may affect but is not likely to adversely affect**" humpback whale.

A "**may affect**" determination is warranted based on the following.

- The project will require some in-water work within a portion of Neah Bay that represents potential habitat for humpback whales.
- The project has the potential to result in temporarily impaired water quality within the action area, including temporarily elevated turbidity levels during pile driving.
- The proposed action will result in temporarily elevated underwater noise levels during impact pile-driving activities.

A **"not likely to adversely affect"** determination is based on the following.

- While humpback whales are frequently present in the adjacent Strait, Neah Bay does not represent suitable habitat for humpback whales.
- All in-water work associated with the proposed action will be conducted during the approved in-water work window for the project (16 July to 15 February), which has been established to minimize potential effects to listed species.

- A MMMP (Appendix D) will be implemented during all pile installation activities. Pile installation will not commence or will be suspended temporarily if any ESA-listed marine mammals are observed within the area that could be potentially affected.

- Given the condition and lack of habitat, the temporary water quality impacts, temporary noise impacts, and relatively small amount of new overwater shading, impacts from pile footprints will not result in any measurable effect on humpback whale.

7.4.1.5 Georgia Basin PS Boccaccio, Georgia Basin DPS Yelloweye Rockfish, and Georgia Basin DPS Canary Rockfish

The proposed action "**may affect but is not likely to adversely affect**" Georgia Basin DPS bocaccio, Georgia Basin DPS yelloweye rockfish, and Georgia Basin DPS canary rockfish. A "**may affect**" determination is warranted based on the following.

- The project will require some in-water work within a portion of Neah Bay that represents potential habitat for larval or juvenile bocaccio, yelloweye rockfish, and/or canary rockfish.

- The project has the potential to result in temporarily impaired water quality within the action area, including temporarily elevated turbidity levels during pile driving.

- The proposed action will result in temporarily elevated underwater noise levels during impact pile driving activities.

A **"not likely to adversely affect"** determination is based on the following.

- The proposed action will conduct all in-water work during the in-water work period.

- Habitat suitability for rockfish within the action area is very low.

- Most rockfish in the action area are from the Pacific coastal stock. Georgia Basin DPS rockfish are not expected to occur frequently within the action area.

- BMPs included as part of this proposed action will be sufficient to ensure that any potential water quality impacts will not result in any adverse effects to any ESA-listed rockfish species.

- Temporarily elevated underwater noise levels will not rise to levels where injury would be expected, and the extent of potential impacts will be limited to temporary avoidance of the action area.

- Given the condition and degree of use of the habitat, the temporary water quality impacts, temporary noise impacts, and relatively small amount of new overwater shading, impacts from pile footprints will not result in any measurable effect on any ESA-listed rockfish species.

7.4.1.6 Southern DPS Pacific Eulachon

The proposed action will have **"no effect"** on Southern DPS Pacific eulachon. This determination is based on the following.

- It is unlikely that any eulachon life stages would be present in the action area. There are no documented eulachon spawning sites in Puget Sound. Other Olympic Peninsula rivers that drain into the Strait of Juan de Fuca have been extensively surveyed for many years for the presence of salmonid species, and eulachon have not been observed. The closest documented eulachon spawning site or migration corridor is the Elwha River on the Olympic Peninsula.

7.4.1.7 Marbled Murrelet

The proposed action **"may affect but is not likely to adversely affect"** marbled murrelet. A **"may affect"** determination is warranted based on the following.

- The project will require work below the MHHW of a portion of Neah Bay that represents potential foraging habitat for marbled murrelet.
- The proposed action will conduct work below the MHHW of Neah Bay during the in-water work period, when marbled murrelet could potentially be present within the action area.
- The project has the potential to result in temporarily impaired water quality within the action area, including temporarily elevated turbidity levels during pile removal and installation.
- The proposed action will result in temporarily elevated underwater noise levels during vibratory and impact pile installation.

A **"not likely to adversely affect"** determination is based on the following.

- Marbled murrelet use of the waters within the action area is low, particularly within the portions of the action area where turbidity and noise levels would be temporarily elevated.
- BMPs included as part of this proposed action, which include limiting in-water work to the in-water work period and using a bubble-curtain or similar noise-attenuating device during impact pile driving/proofing, will be sufficient to ensure that any potential temporary water quality or noise impacts will not result in any adverse effects to any marbled murrelet.

- A marbled murrelet monitor will monitor the action area during all impact pile installation activities. Impact pile installation will not commence or will be suspended temporarily if any marbled murrelets are observed within 138 feet of the pile being impact driven.

- Given the condition and degree of use of the habitat, the temporary water quality impacts, temporary noise impacts, and relatively small amount of new overwater shading will not result in any measurable effect on marbled murrelet or any of its prey species.

7.4.2 Critical Habitats

7.4.2.1 Designated salmon and bull trout critical habitat, and proposed steelhead critical habitat

Critical habitat has been designated for Puget Sound ESU Chinook salmon, Hood Canal summer-run ESU chum salmon, Puget Sound DPS steelhead and Puget Sound bull trout, but none occurs within the action area. The effects determination is that the proposed project will have **"no effect"** on these designated and proposed critical habitats. A **"no effect"** determination is warranted based on the following rationale.

- No designated or proposed salmon, steelhead, or bull trout critical habitat is present within the action area.

7.4.2.2 Designated Southern Resident DPS orca critical habitat

The portion of Neah Bay that comprises the action area has been designated critical habitat for Southern Resident DPS orca. The effects determination is that the proposed project may affect, but is not likely to adversely affect designated critical habitat for Southern Resident DPS orca. A **"may effect"** determination is warranted based on the following rationale.

- The proposed action will require work below the MHHW of Neah Bay, which has been designated critical habitat for Southern Resident DPS orca.

- The portion of Neah Bay in the action area provides suitable "water quality," "prey species," and "passage" PCEs of critical habitat for Southern Resident DPS orca.

- The project has the potential to result in temporarily impaired water quality within the action area, including temporarily elevated turbidity levels during pile installation.

- The proposed action will result in temporarily elevated underwater noise levels during impact pile installation.

A **"not likely to adversely affect"** determination is based on the following.

- Water quality and noise impacts that may result during construction will be temporary and will result in no significant effects to any elements that would degrade the "water quality," "prey species," or "passage" PCEs of critical habitat for Southern Resident DPS orcas.

- Given the condition and degree of use of the habitat, the temporary water quality impacts, temporary noise impacts, and mitigation for increased overwater coverage, the project will not result in any measurable effect on any PCE of critical habitat for Southern Resident DPS orca.

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9.0 LIST OF ABBREVIATIONS AND ACRONYMS

BMP	best management practice
BRT	Biological Review Team
CFR	Code of Federal Regulations
dBA	decibel
DMMO	Dredged Material Management Office
DMMP	Dredged Material Management Program
DNR	Washington State Department of Natural Resources
DPS	Distinct Population Segment
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
ERTV	emergency response towing vessel
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FR	functioning at risk
FTA	Federal Transit Administration
GRP	Geographical Response Plan
LTAA	likely to adversely affect
LWD	large woody debris
MHHW	mean higher high water
MLLW	mean lower low water
MMMP	marine mammal monitoring plan
MMPA	Marine Mammal Protection Act
NA	not applicable
NE	no effect
NLTAA	not likely to adversely affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPF	not properly functioning
PCE	primary constituent elements
PF	properly functioning

PHS	Priority Habitat and Species
RMS	root mean square
SPCC	spill prevention control and countermeasures
Tribe	Makah Indian Tribe
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

Appendix A
Figures (Sheets 1 to 14)

PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

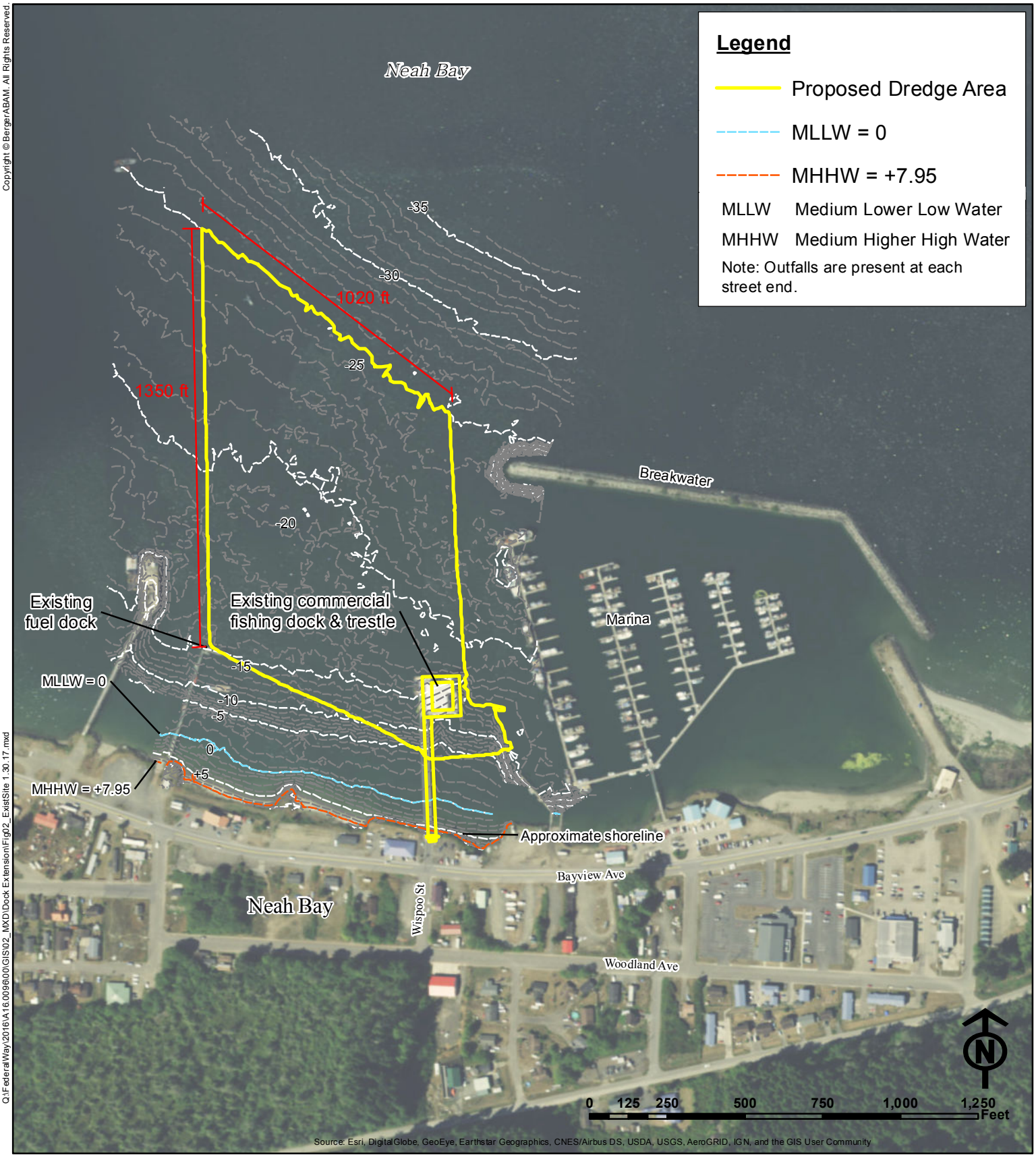
PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

SHEET 1: VICINITY MAP

USACE REFERENCE: 2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

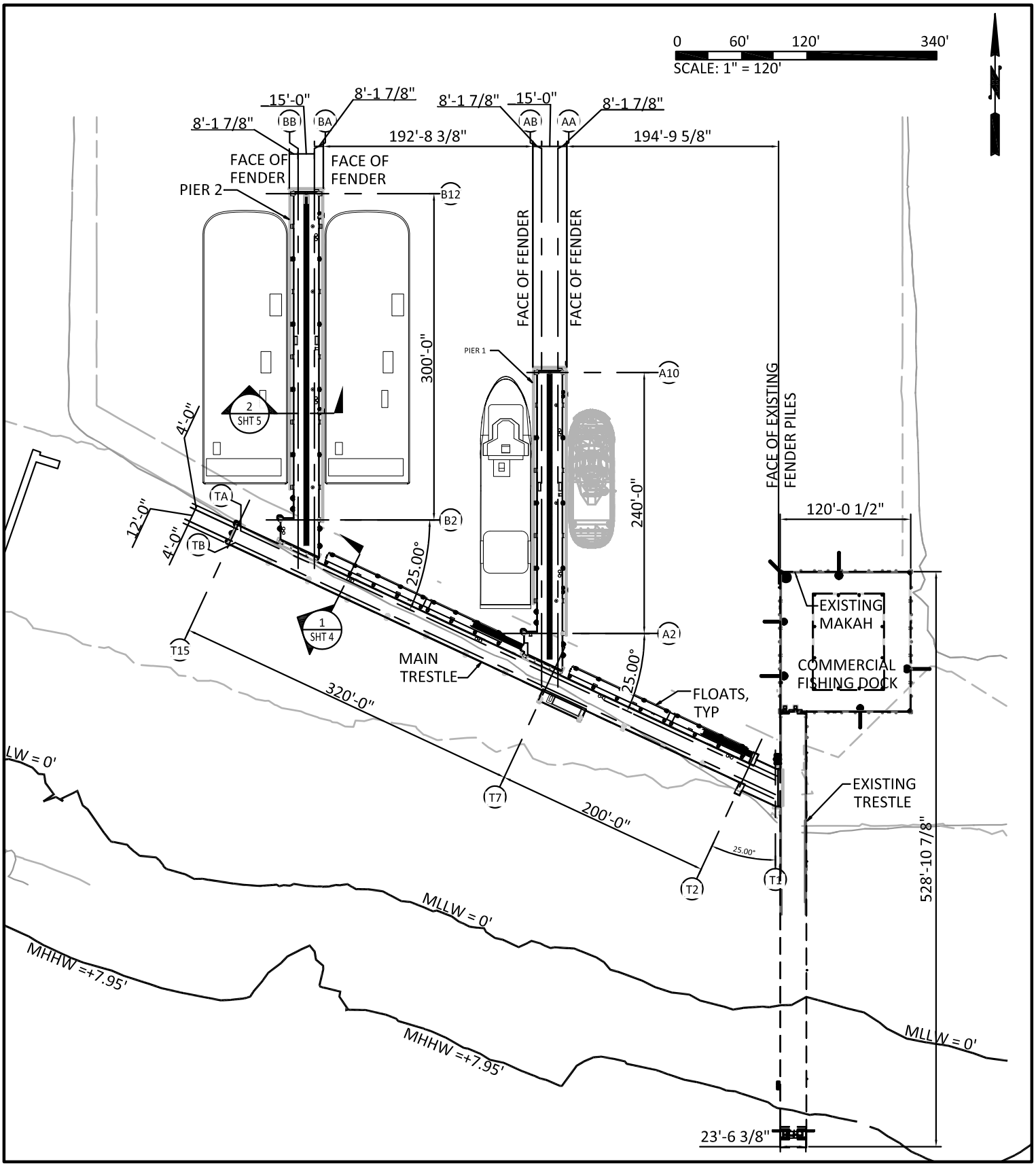
PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

SHEET 2: SITE PLAN EXISTING CONDITIONS

USACE REFERENCE: 2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.
APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

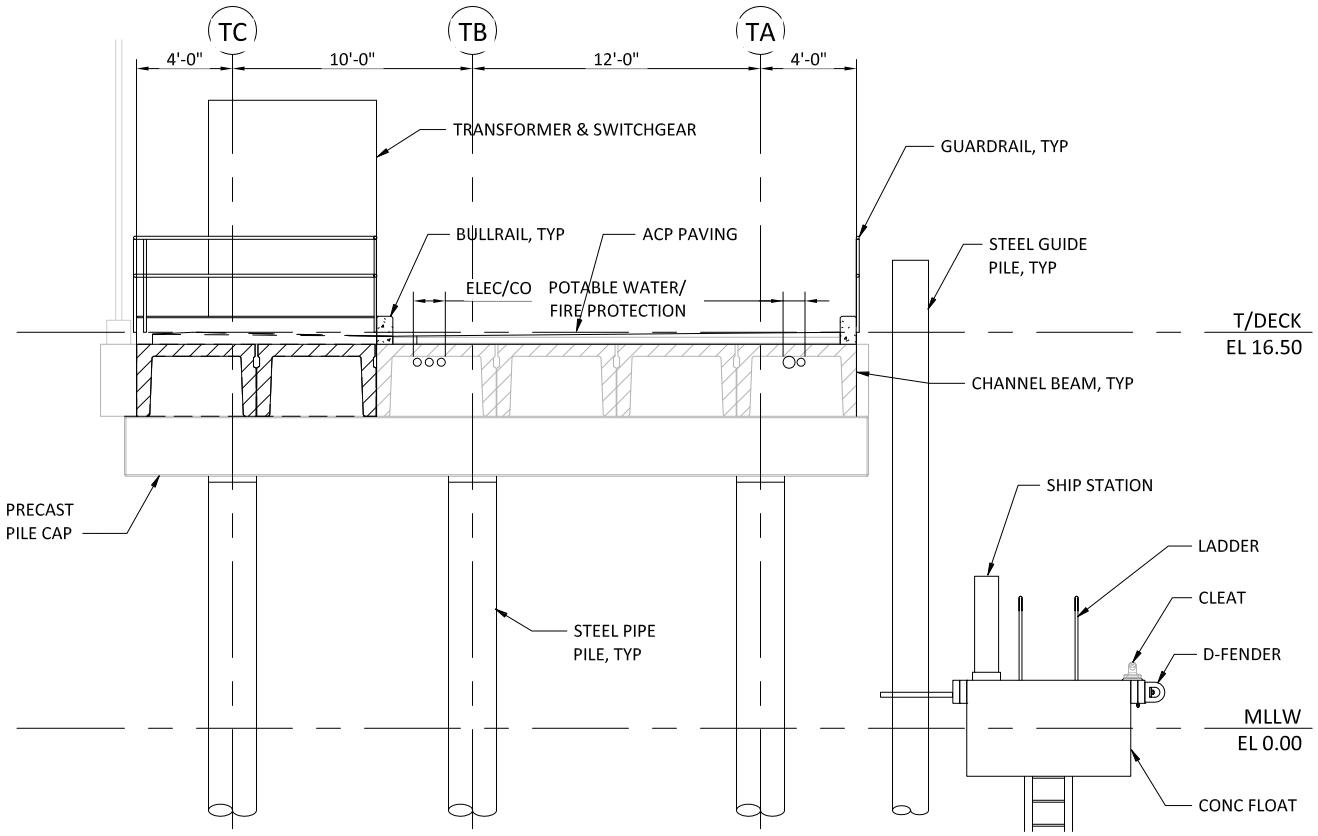
PORT OF NEAH BAY

PURPOSE DOCK EXTENSION

SHEET 3: PROPOSED DOCK EXTENSION PLAN

USACE REFERENCE: 2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



1 FIG 3 PROPOSED TRESTLE
SCALE: 1"= 8'

8 0 8 16

PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.
APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

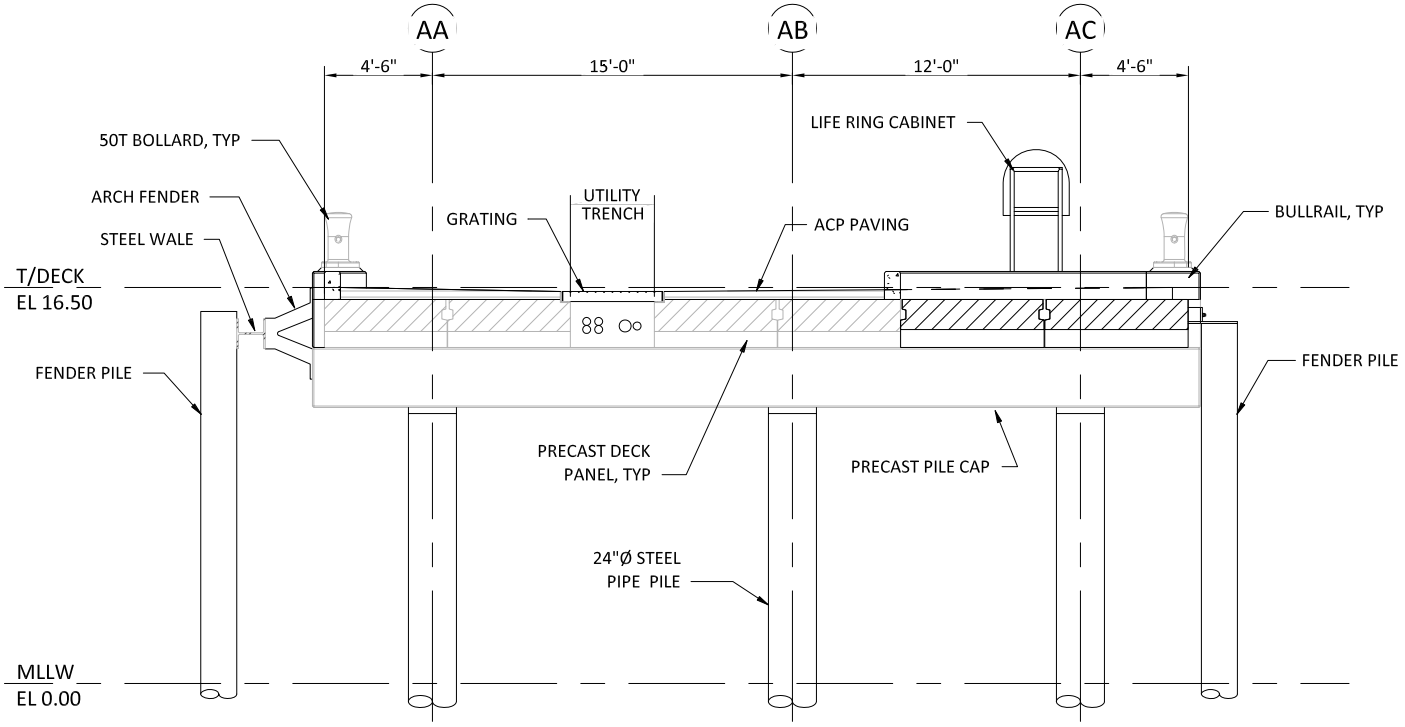
PORT OF NEAH BAY

PURPOSE DOCK EXTENSION

SHEET 4: PROPOSED DOCK EXTENSION
SECTION 1

USACE REFERENCE: 2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



2
FIG 3

PROPOSED PIER

SCALE: 1"= 8'

8 0 8 16

PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.
APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

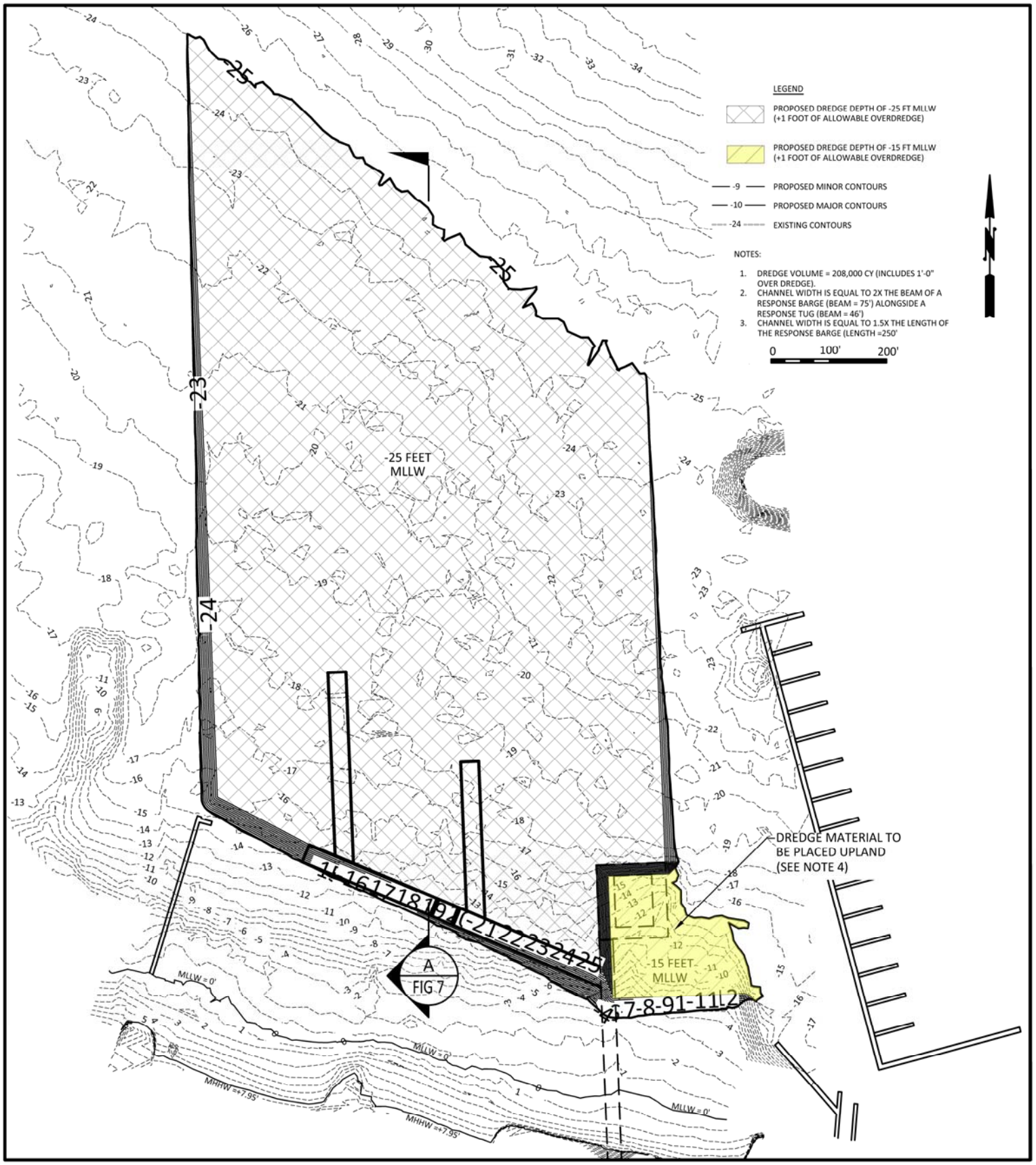
PORT OF NEAH BAY

PURPOSE DOCK EXTENSION

SHEET 5: PROPOSED DOCK EXTENSION
SECTION 2

USACE REFERENCE: 2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accomodate vessels.
APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

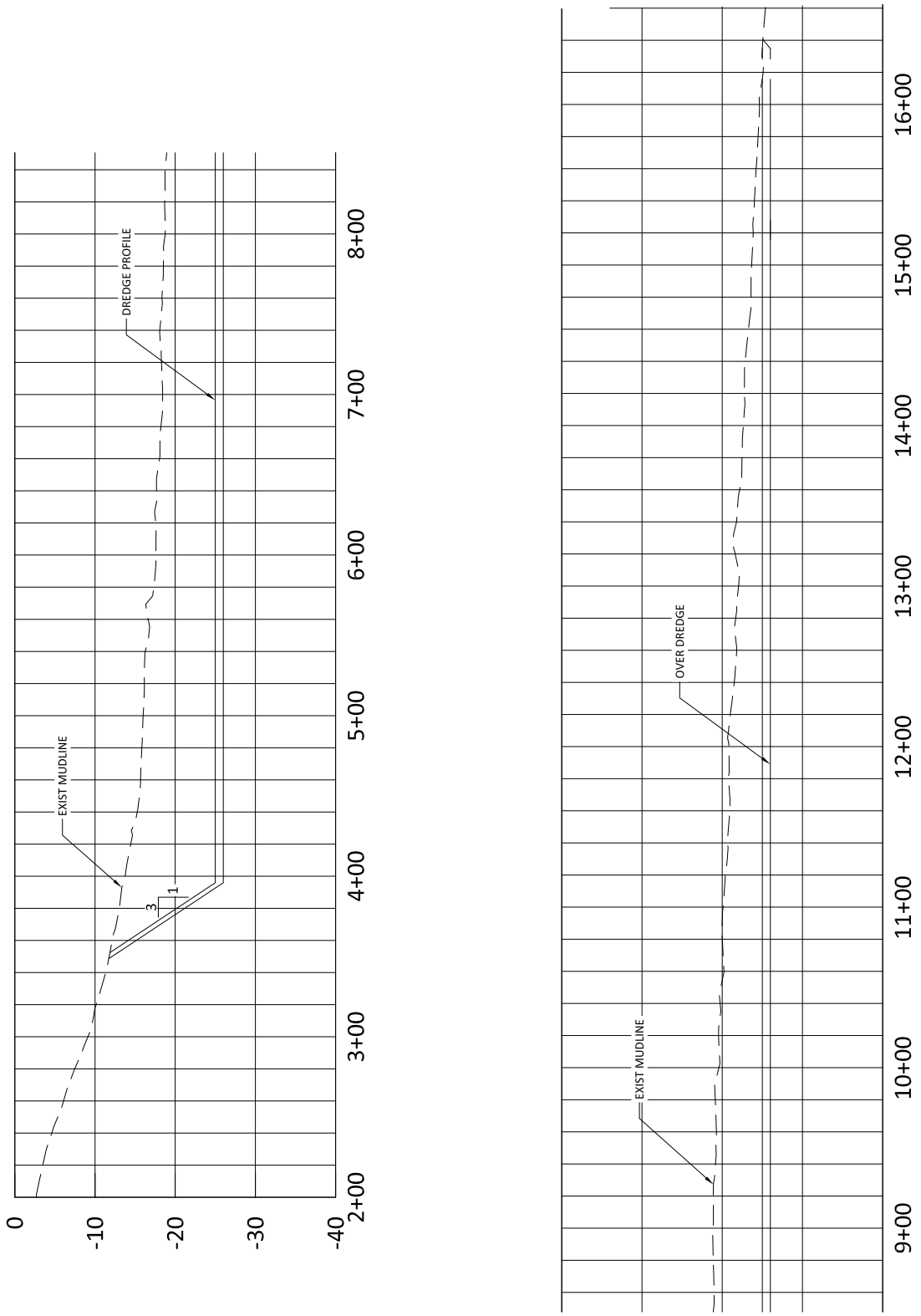
PORT OF NEAH BAY

PURPOSE DOCK EXTENSION

SHEET 6: PROPOSED DREDGE PLAN

USACE REFERENCE: 2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



A FIG 6 PROPOSED DREDGE SECTION A
Vertical Scale: 1"=20', Horizontal Scale: 1"=100'

PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.
APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

PORT OF NEAH BAY

PURPOSE DOCK EXTENSION

SHEET 7: PROPOSED DREDGE SECTION A

USACE REFERENCE: 2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017

PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

SHEET 8: DREDGED MATERIAL PLACEMENT SITE/BEACH RESTORATION

USACE REFERENCE: 2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam
LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017

PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

SHEET 9: FORMER NEAH BAY BEACH

USACE REFERENCE: 2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017

PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

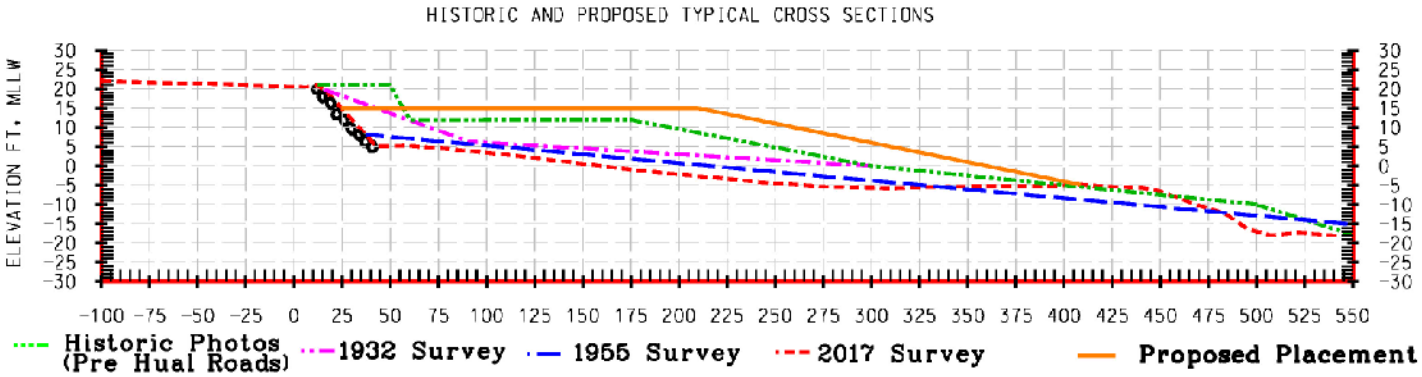
PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

SHEET 10: FORMER NEAH BAY BEACH

USACE REFERENCE: 2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

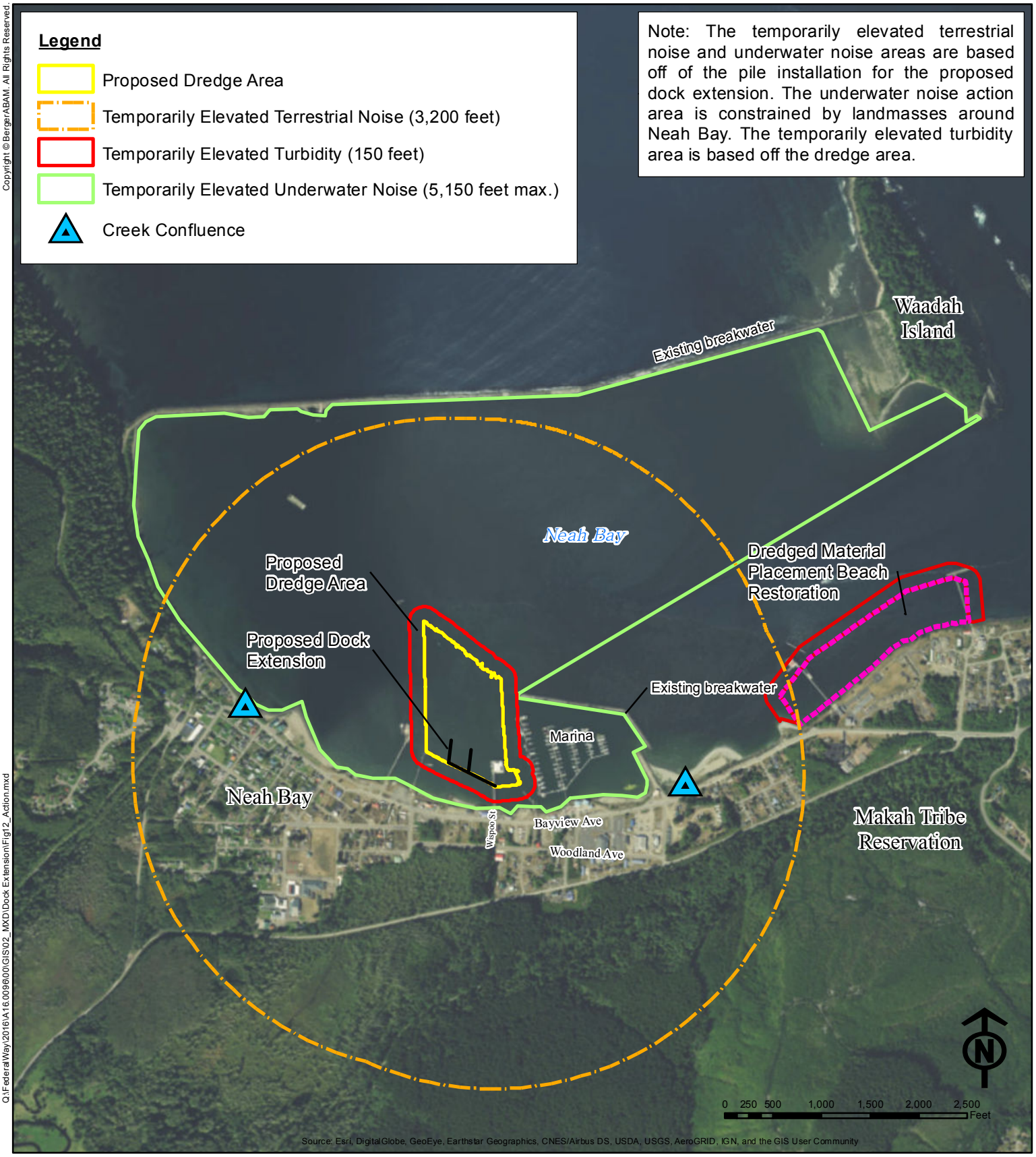
PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

SHEET 11: HISTORIC BEACH PROFILE

USACE REFERENCE: NWS-2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

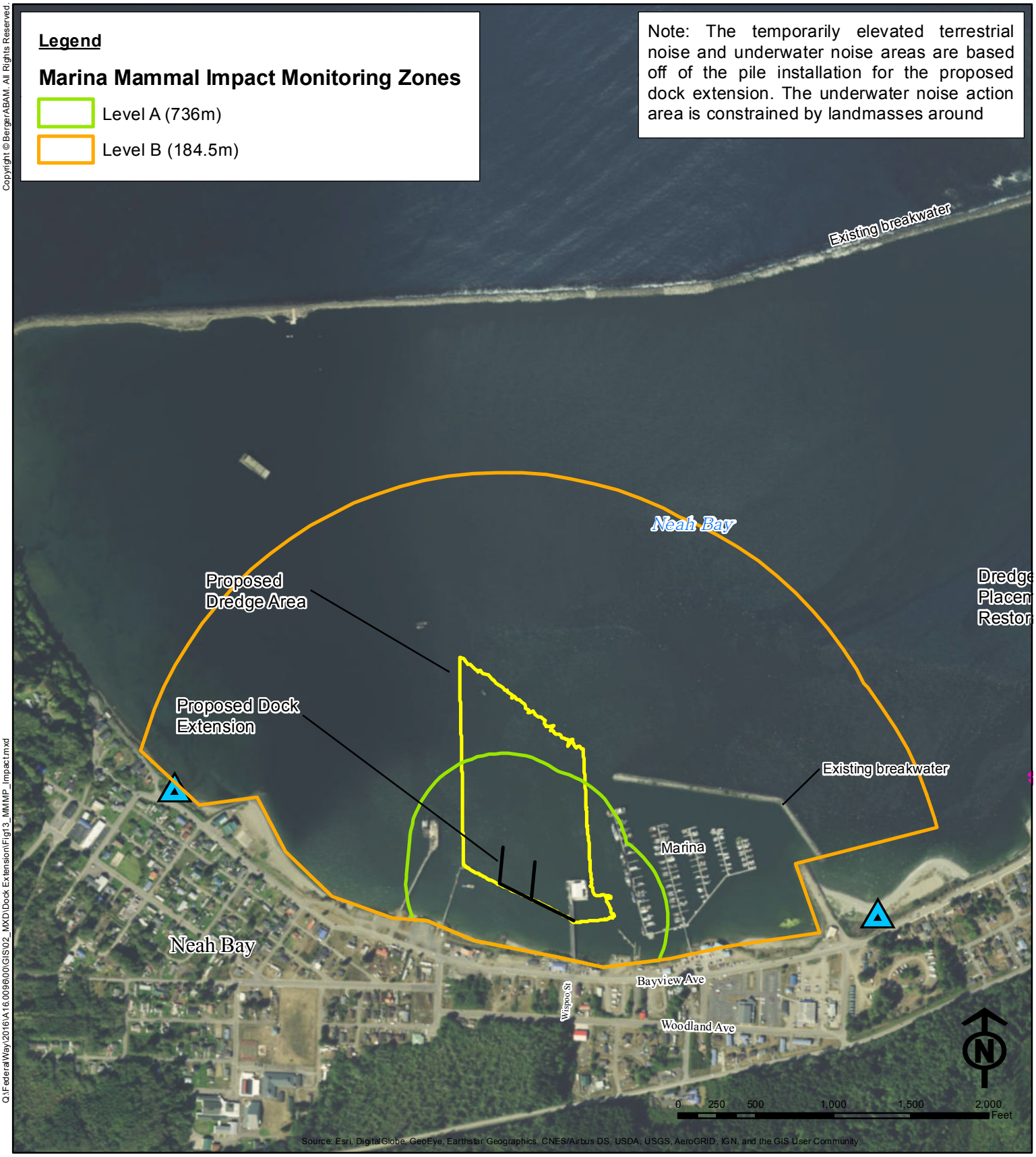
PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

SHEET 12: ACTION AREA

REFERENCE: NWS-2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

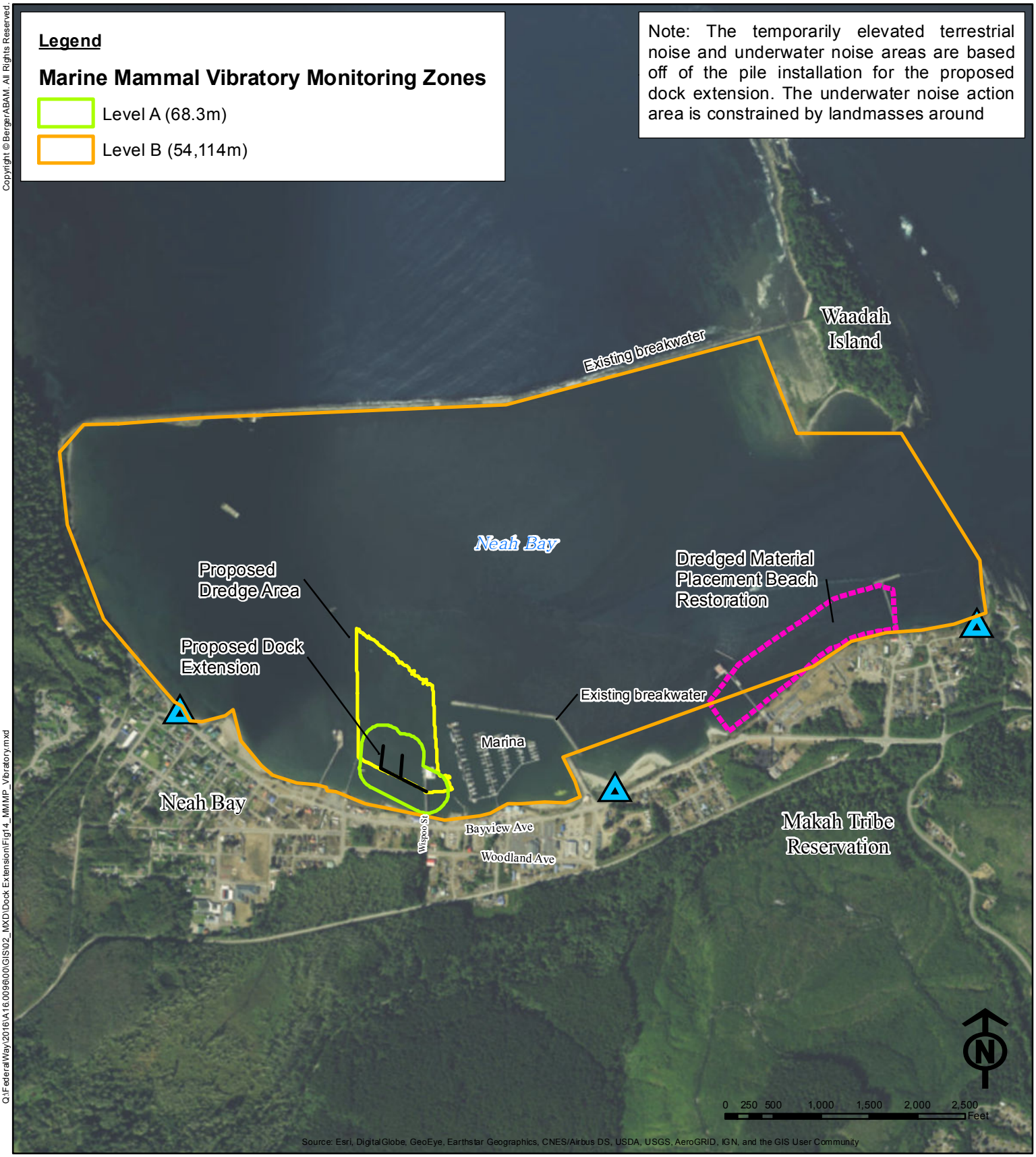
ADJACENT PROPERTY OWNERS:
Department of Natural Resources

PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

SHEET 13: MARINE MAMMAL MONITORING - IMPACT HAMMER

REFERENCE: NWS-2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam
LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

SHEET 14: MARINE MAMMAL MONITORING - VIBRATORY HAMMER

REFERENCE: NWS-2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam
LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017

Appendix B
DMMP Suitability Determination

CENWS-ODS-ND

MEMORANDUM FOR: RECORD May 16, 2017

SUBJECT: DETERMINATION REGARDING THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM THE MAKAH TRIBE, EMERGENCY SPILL DOCK EXTENSION, NEAH BAY, WASHINGTON (NWS-2016-826) FOR IN-WATER DISPOSAL AT THE DMMP PORT ANGELES DISPERSIVE DISPOSAL SITE, AT AN APPROVED BENEFICIAL USE SITE, OR PLACEMENT AT AN APPROVED UPLAND SITE.

1. INTRODUCTION. This memorandum reflects the consensus determination of the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Environmental Protection Agency, and Washington Departments of Ecology and Natural Resources) regarding the suitability of up to a total of 208,031 cubic yards (cy) of dredged material from the Makah Tribe Emergency Spill Dock Extension project in Neah Bay for disposal at the DMMP Port Angeles open-water disposal site, placement within Neah Bay for intertidal and/or subtidal beneficial use, or placement at an approved upland site.

2. PROJECT SUMMARY. The Makah Tribe proposes to dredge areas around an existing commercial fishing dock and construct a large dock extension to establish a facility for emergency oil spill response vessels (Figure 1). The project proposes to increase the depths within the new berthing area to elevations ranging from -15 to -25 feet mean lower low water (MLLW) plus one foot allowable overdepth (-16 to -26 feet MLLW). Most of the berthing area will be dredged to an elevation of -25 feet MLLW (plus one foot of allowable overdepth) to accommodate spill response vessels and to provide access to deeper waters of Neah Bay. The portion of the dredge prism to the south and east of the existing commercial fishing dock (Figure 2) will be dredged to an elevation of -15 feet MLLW (plus one foot of allowable overdepth) to provide access for small boats. Dredging is proposed for the fall/winter of 2018/2019. Suitable material is proposed for placement using hydraulic pipeline or clamshell dredging equipment on permitted beneficial use sites within the bay. The area has never been previously dredged.

Table 1. Makah Tribe Emergency Spill Response Dock - Project Tracking

Draft SAP received	13 October 2016
Draft SAP comments submitted	27 October 2016
Final SAP received	7 November 2016
Final SAP approved	15 November 2016
Sampling date	21 November 2016
Data report received	8 February 2017
Updated data report received	4 April 2017
DMMP Tracking number	MAKAH-1-A-F-379
EIM Project number	MAKAH17
USACE Permit Number	NWS-2016-826
Recency Expiration Date (LM Rank = 6 years)	30 November 2022

3. PROJECT RANKING AND SAMPLING REQUIREMENTS. The sampling approach was based on the proposed dredge volume, dredge prism configuration, and sampling frequency, and also based on typical cross sections and conditions within the project area (Table 2). The area has never been dredged or previously characterized. The project was ranked “low-moderate” for this characterization,

based on DMMP general guidelines (DMMP 2016) for a site removed from major sources of contamination but without sufficient data to support a "low" rank.

Table 2. DMMUs and Sampling Strategy

DMMU ID	sub units	Assumed Elevation (ft MLLW)	Dredge Depth + 1' OD (ft MLLW)	Approximate Total DMMU Volume (cy)
DMMU 1	S-1	-23	-26	31,787
	S-2	-22		
	S-3	-24		
	S-4	-23.5		
DMMU 2	S-5	-23	-26	31,983
	S-6	-21		
	S-7	-20		
	S-8	-20.5		
DMMU 3	S-9	-19	-26	31,991
	S-10	-19		
	S-11	-18		
	S-12	-18		
DMMU 4	S-13	-19	-26	31,912
	S-14	-18		
	S-15	-19		
	S-16	-20		
DMMU 5	S-17	-17	-26	31,997
	S-18	-17.5		
	S-19	-16		
	S-20	-16		
DMMU 6	S-21	-17	-26	31,791
	S-22	-17		
	S-23	-14		
	S-24	-13		
DMMU 7	S-25	-16	-26	3,288
	S-26	-19		4,359
	S-27	-7	-16	4,262
	S-28	-12		4,661
Total				208,031

For a low-moderate project of heterogeneous sediment, the number of samples and analyses are calculated using the following guidelines:

- Maximum volume of sediment represented by each field sample = 8,000 cubic yards.
- Maximum volume of sediment represented by each analysis in the upper 4-feet of the dredging prism (surface sediment) = 32,000 cubic yards.
- Maximum volume of sediment represented by each analysis in the subsurface portion of the dredging prism = 48,000 cubic yards.

For this project, although the proposed dredge cut is greater than four feet deep in some locations, all material was considered "surface" material; sample density was one sample per 8,000 cy and one analysis (DMMU) per 32,000 cy. The DMMU that encompassed the shallow dredge area (to -15 ft MLLW) was considered most likely to be exposed to potential contamination, and that DMMU (DMMU-7) contained about half the sediment volume as the other DMMUs (Table 2).

Prior to submittal of the Sampling and Analysis Plan (BergerAbam 2016b), the Tribe proposed a sampling approach to characterize this project with surface samples rather than sediment cores. They

based this proposal on previous sampling and geotechnical borings in Neah Bay that found dense subsurface materials that were difficult to penetrate. In addition, there are few sources of sediment to Neah Bay and sediment deposition has been negligible in recent years. This information, along with the lack of any previous dredging in the area, allowed the DMMP to use BPJ (best professional judgment) to approve the use of surface samples to characterize this material. In this case, subsurface material is presumably native material with little chance for contamination. The Tribe's proposal to use a pneumatic power grab sampler was accepted, as the site history in this location indicates surface samples likely reflect a worst-case scenario for any potential chemicals of concern.

4. SAMPLING. Sampling took place on 21 November 2016, using a pneumatic power grab sampler. Twenty-eight grab samples were obtained per the approved SAP (Table 3). Two sample locations were revised in the field and coordinated with DMMO as required: sample S-3 was moved approximately 320 feet south because the proposed location was deeper than the design dredge depth, and sample S-24 was moved approximately 20 feet east because the planned GPS coordinates described in the SAP did not match the proposed location shown in the SAP (Figure 3).

Table 3. Sample Locations and Depths

DMMU ID	Dredge Depth Elevation + 1-ft OD (ft MLLW)	Sample ID [1]	Northing [2]	Easting [2]	Adjusted Mudline Elevation [3] (ft MLLW)	Sample Depth Recovered (inches)
1	-26	S-1	522599.41	721118.52	24.21	10.5
		S-2	522338.53	721278.71	23.20	12
		S-3	522211.50	721526.42	24.32	8.5
		S-4	522076.18	721731.22	24.93	12
2	-26	S-5	521868.41	721772.38	24.51	8
		S-6	521956.54	721571.43	22.93	9
		S-7	522093.51	721400.31	21.97	10.5
		S-8	522190.44	721155.75	21.81	8.5
3	-26	S-9	522051.21	721116.85	20.05	11
		S-10	521949.58	721304.46	20.69	10.5
		S-11	521848.89	721127.36	19.28	11
		S-12	521753.59	721305.15	19.37	10
4	-26	S-13	521783.08	721490.90	20.70	10
		S-14	521617.10	721476.04	19.24	10
		S-15	521651.74	721627.71	20.33	10.5
		S-16	521625.40	721772.95	21.22	10
5	-26	S-17	521712.24	721107.34	18.82	11
		S-18	521627.72	721287.53	18.81	10.5
		S-19	521552.34	721119.78	17.55	8.5
		S-20	521491.09	721304.29	17.36	10
6	-26	S-21	521539.89	721425.13	18.68	9
		S-22	521476.01	721541.82	18.57	8
		S-23	521406.57	721450.00	15.59	10
		S-24	521320.59	721632.41	14.37	9.5
7	-26	S-25	521393.89	721712.53	16.87	6
		S-26	521482.26	721767.89	20.05	6
	-16	S-27	521237.51	721794.09	10.94	6.5
		S-28	521273.17	721914.74	12.66	8

NOTES:
[1] See Figure 3 for sample locations
[2] Northing and easting are based on the North American Datum of 1983 (NAD83) State Plane Coordinate System, Washington North
[3] Adjusted Mudline Elevation = Water Depth + Tidal Stage

5. CONVENTIONAL AND CHEMICAL ANALYSES. The approved sampling and analysis plan was followed and quality control guidelines specified by the PSEP and DMMP programs were met, with only minor quality control deviations (BergerABAM 2017). All laboratory analyses were performed by Analytical Resources Inc. (ARI) in Tukwila, Washington and their subcontractors. After results of the initial seven composite analyses were received, some follow-up analyses were done, per details below. Because the dredged material is being considered for a variety of disposal alternatives/beneficial use projects, the Tribe requested that material also be evaluated under the SMS program to assist review by other regulatory programs. The final data were considered sufficient and acceptable for regulatory decision-making under the DMMP program.

5.1 Sediment Conventionals. Sediment conventional results (Table 4) showed that the proposed dredged material is predominantly fine sand with some silt and clay. Total fine fractions (silt + clay) ranged from 17% in DMMU-7 to 51% in DMMU-3. Total organic carbon ranged from 0.4% to 1.7%. Organic materials such as algae, worms, roots and shells were incorporated into the sediment in several samples. Small debris such as bottles, cans, rubber gloves and a boat battery were also found in some samples, particularly in DMMU-7.

5.2 Sub-Sample Analyses. Results from the DMMU-7 composite indicated a DMMP exceedance of mercury and SMS exceedances of mercury as well as several PAHs. Previously archived separate subsamples of DMMU-7 (S-25, S-26, S-27 and S-28) were then submitted for analysis of total organic carbon, total solids, mercury, PAHs and phthalates. By the time the composite results were received from the lab, the 28-day holding time for mercury for the subsamples had expired by about 2 ½ weeks. Results for those subsamples are qualified by the lab (Tables 5 and 6).

Table 4. Makah Tribe Emergency Response Dock - Summary of Conventional Results

		Dredged Material Management Unit (DMMU)							DMMU 7 subsamples			
		1	2	3	4	5	6	7	S-25	S-26	S-27	S-28
DMMU Volume		31,787	31,983	31,991	31,912	31,997	31,791	16,570	3,288	4,359	4,262	4,661
Grain Size (% total)	Gravel	0.1	8.3	0.1	0	0	0	3.6	---	---	---	---
	Sand	76.2	67	48.6	72.3	66.8	79.7	79.7	---	---	---	---
	Silt	15.7	16.8	31.8	16	21.8	13.7	11	---	---	---	---
	Clay	8.2	7.7	19.6	11.7	11.3	6.5	5.5	---	---	---	---
	Total Fines (silt+clay)	23.9	24.5	51.4	27.7	33.1	20.2	16.5	---	---	---	---
Ammonia (mg/kg dry wt.)		24.9	8.86	17.7	4.35	11.8	4.15	4.83	---	---	---	---
Total Sulfides (mg/kg dry wt.)		5.93	133	845	227	564	88.7	638	---	---	---	---
Total Solids (%)		67.33	64.23	47.02	62.52	51.21	71.79	71.13	66.1	77.03	71.37	72.5
Total volatile solids (%)		2.98	3.56	6.81	3.84	6.31	2.36	2.54	---	---	---	---
Total organic carbon (%)		0.62	0.88	1.59	0.92	1.74	0.41	0.62	1.05	0.41	0.55	0.57

5.3 DMMP Guideline Comparisons.

5.3.1 Standard Chemicals of Concern: Chemical results for DMMUs 1 - 6 all indicated no detected or undetected exceedances of standard DMMP chemicals of concern screening levels (Table 5). Low levels of PAHs were detected in these DMMUs but were generally an order of magnitude below DMMP SLs. DMMU-7 was different: that composite had a slight mercury exceedance (0.46 mg/kg dry wt; the SL is 0.41 mg/kg dry wt) as well as higher PAH detections

compared to the other DMMUs. Though elevated over the other DMMUs, the total HPAHs of 6,411 ug/mg dry wt in DMMU-7 were still only about half the DMMP SL of 12,000 ug/mg dry wt.

5.3.2 Non-Standard Chemicals of Concern: Analyses for bulk TBT were done on composites from DMMUs adjacent to the nearby marina: DMMUs 1, 2, 4 and 7. TBT was undetected in all samples. Petroleum hydrocarbons were analyzed in DMMUs 6 and 7 and were either undetected or detected at low levels. No dioxin analyses were required.

5.3.3 Subsample Analyses. Each of the four samples that were composited for DMMU-7 underwent additional separate analyses in an attempt to qualify composite results and to provide further information should bioassay testing be pursued. Mercury analyses in the subsamples were all detected well below the DMMP guidelines, although the holding times were expired. These results were not considered sufficient evidence to set aside the mercury exceedance in the composite. In addition, two of the subsamples showed PAH exceedances over DMMP SLs, including an exceedance of total HPAHs in S-27. S-28 had no exceedances of PAHs but it did have an SL exceedance of dimethyl phthalate. Only S-26 had no exceedances. Thus, three out of four subsamples comprising DMMU-7 exceeded DMMP guidelines.

5.4 SMS Guideline Comparisons. All results of the chemical analyses were organic carbon normalized if necessary and compared to Washington State Sediment Management Standards. As with the DMMP comparison, the only detected exceedances of SMS standard chemicals of concern were found in DMMU-7 and its subsamples (Table 6). There was one undetected exceedance of OC normalized results for 1,2,4-trichlorobenzene in DMMU-6. That DMMU, however, had the lowest total organic carbon of all the analyzed composites (0.41% mg/kg dry wt.). For sediment samples lower than 0.5% TOC, use of the normalized value may not be appropriate (Michelsen 1992). In this case, the DMMP used BPJ to determine that the dry wt. concentration of the undetected value is sufficient to indicate that the chemical is not present at SMS guideline values.

This evaluation showed that all material suitable for open-water disposal may also be suitable for approved, in-water beneficial uses under Washington State Sediment Management Standards and DMMP guidelines, depending on the specifics of the proposed use. As always, actual beneficial uses must be approved in other applicable permits and/or authorizations.

6. BIOLOGICAL TESTING. The Tribe chose not to pursue further testing under DMMP's tiered evaluation program at this time and thus no biological testing was conducted. Thus, all material in DMMU-7 (16,750 cy) was found not suitable for unconfined open-water disposal. Further sampling and testing could be considered for this unsuitable material should the Tribe choose to pursue biological testing in the future.

7. UNSUITABLE MATERIAL BUFFERS. Since the true border between suitable and unsuitable material cannot be known due to the nature of sediment sampling, the DMMP agencies typically request that ½ the distance to the nearest sample in neighboring DMMUs be considered unsuitable and be dredged and disposed along with the unsuitable material. In this case, the unsuitable DMMU-7 surrounds the existing commercial fishing dock which appears to be the source of physical debris and chemical contamination. A video survey of debris within the dredge prism indicated that similar conditions may extend west into DMMU-6 but not north into DMMU-4 (see Figure 4). The Tribe and the Agencies agreed on an unsuitable buffer into DMMU-6 of approximately 13,070 ft^2 which includes an additional 4,700 cy of dredged material.

8. POST-DREDGE SEDIMENT QUALITY. The sediment to be exposed by dredging must either meet the State of Washington Sediment Quality Standards (SQS) or the State's Antidegradation standard (Ecology 2013) as outlined by DMMP guidance (DMMP 2008). For this project, site history tells us that the proposed post-dredge material is native sediment most likely not exposed to any potential contaminant sources, and there is no reason to believe that the sediment to be exposed by dredging is degraded relative to the current sediment surface. Thus, the DMMP agencies concluded that this project is in compliance with the State of Washington anti-degradation policy.

9. SUITABILITY DETERMINATION. This memorandum documents the evaluation of the suitability of sediment proposed for dredging from the Makah Tribe Emergency Spill Dock Extension for open-water disposal at a DMMP dispersive disposal site. It also evaluates potential suitability for in-water beneficial uses. The approved sampling and analysis plan was followed and the data gathered were deemed sufficient and acceptable for regulatory decision-making under the DMMP program. Based on the results of the previously described testing, the DMMP agencies concluded that 186,761 cy are suitable for open-water disposal. A total of 21,270 cy are NOT suitable for in-water disposal, as detailed below and in Figure 4:

    - Suitable for in-water disposal: DMMUs 1, 2, 3, 4, 5 and 27,091 cy in DMMU 6
    - Unsuitable for in-water disposal: DMMU 7 and 4,700 cy in DMMU 6

    DMMUs suitable for open-water disposal are also potentially suitable for in-water beneficial use. However, any proposed beneficial use site must be separately permitted and may have additional guidelines or requirements for use of this material.

    9.1 Debris Management. The DMMP agencies implemented a debris screening requirement in 2015 to prevent the disposal of solid waste and large debris at open-water disposal sites (DMMP 2015). It states that "all projects must use a screen to remove debris unless it can be demonstrated that debris is unlikely to be present or that the debris present is large woody debris that can be easily observed and removed by other means during dredging." For this project, a 12"x12" debris screen must be used for all material dredged by clamshell and placed on a barge for disposal, unless information is provided to the DMMP that meets the "reason to believe" criteria laid out in DMMP 2015. Equivalent debris management must be applied to material dredged via hydraulic dredge for in-water disposal. The Tribe has prepared a Mitigation Plan (BergerAbam 2017a) that includes debris removal as part of project mitigation, and states that debris will be removed prior to, or concurrent with, dredging.

    9.2 Permitting. This suitability determination does *not* constitute final agency approval of this project. During the comment period that follows a public notice, resource agencies will provide input on the overall project. A final decision will be made after full consideration of agency input, and after an alternatives analysis is done under section 404(b)(1) of the Clean Water Act. A DNR site use authorization must also be acquired for disposal at a DMMP open-water disposal site.

    9.3 Pre-Dredge Quality Control Plan and Meeting. A pre-dredge meeting with DNR, Ecology, EPA and the Corps of Engineers is required at least 7 days prior to dredging. A dredging quality control plan (QCP) must be developed and submitted to the Regulatory Branch of the Seattle District Corps of Engineers at least 14 days prior to the pre-dredge meeting. The dredging quality control plan must clearly show how the unsuitable material will be dredged and handled separately from suitable material. Dredging, positioning, de-watering, transloading and disposal must be addressed with enough detail to provide assurance to the agencies that the dredge plan will be properly implemented. The QCP must include a debris management plan.

10. REFERENCES

BergerABAM 2017a. *Dredged Material Characterization Report, Makah Tribe – Emergency Spill Dock Extension, Neah Bay, Washington*. Prepared by BergerABAM for US Army Corps of Engineers, Seattle District. 3 February 2017.

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DMMP 2016. *Dredged Material Evaluation and Disposal Procedures (User Manual)*. Dredged Material Management Program, updated August 2016.

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Michelsen 1992. *Technical Information Memorandum: Organic Carbon Normalization of Sediment Data.* Prepared by Teresa C Michelsen, Ph.D., Washington Department of Ecology. Publication No. 05-09-050, December 1992.

11. AGENCY SIGNATURES

SUBJECT: DETERMINATION REGARDING THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM THE MAKAH TRIBE, EMERGENCY SPILL DOCK EXTENSION, NEAH BAY, WASHINGTON (NWS-2016-826) FOR IN-WATER DISPOSAL AT THE DMMP PORT ANGELES DISPERSIVE DISPOSAL SITE, AT AN APPROVED BENEFICIAL USE SITE, OR PLACEMENT AT AN APPROVED UPLAND SITE.

Concur:

5/16/2017 _____
Date Lauran Cole Warner - Seattle District Corps of Engineers

16 May 2017 _____
Date Justine Barton - Environmental Protection Agency

05/23/2017 _____
Date Laura Inouye, Ph.D. - Washington Department of Ecology

5/23/17 _____
Date Celia Barton - Washington Department of Natural Resources

Copies furnished:

DMMP signatories
Juliana Houghton, Seattle District Regulatory
Victoria England, BergerABAM
Norman Down, Makah Tribe
Bob Buckingham, Port of Neah Bay

Makah Tribe Emergency Spill Dock | Results of Chemical Analysis Compared to DMMP Guidelines | DMMP Suitability Determination

													DMMU 7 subsamples								DMMP Criteria (dry wt)		
	DMMU-1		DMMU-2		DMMU-3		DMMU-4		DMMU-5		DMMU-6		DMMU-7		S-25		S-26		S-27		S-28		SL	BT	ML
CONVENTIONALS (mg/kg dry weight)																									
Ammonia	24.9		8.86		17.7		4.35		11.8		4.15		4.83		---		---		---		---		---	---	---
Total sulfides	5.93		133		845		227		564		88.7		638		---		---		---		---		---	---	---
GENERAL CHEMISTRY (percent)																									
Total solids	67.33		64.23		47.02		62.52		51.21		71.79		71.13		66.1		77.03		71.37		72.5		---	---	---
Total volatile solids	2.98		3.56		6.81		3.84		6.31		2.36		2.54		---		---		---		---		---	---	---
Total organic carbon	0.62		0.88		1.59		0.92		1.74		0.41		0.62		1.05		0.41		0.55		0.57		---	---	---
METALS (mg/kg dry weight)																									
Antimony	18.2	U	1.45	J	1.23	J	1.09	J	1.32	J	1.08	J	1.26	J	---		---		---		---		150	---	200
Arsenic	18.2	U	6.48	U	8.83	U	7.58	U	8.72	U	14.1	U	6.15	U	---		---		---		---		57	507.1	700
Cadmium	0.55	JD	0.31		0.64		0.42		0.61		0.6		0.55		---		---		---		---		5.1	---	14
Chromium	30.1		23.7		41.6		26.8		37.6		24.1		19.1		---		---		---		---		260	---	---
Copper	16.6		12.5		32.5		17		22.4		16.5		23		---		---		---		---		390	---	1,300
Lead	7.36		6.97		15		7.97		12.2		7.93		7.68		---		---		---		---		450	975	1,200
Mercury	0.064		0.018	J	0.05		0.04		0.09		0.03		0.46		0.07	H	0.05	H	0.01	HJ	0.17	H	0.41	1.5	2.3
Selenium	1.1		1.41		1.82		1.21		1.49		0.79		0.92		---		---		---		---		---	3	---
Silver	1.09	U	0.39	U	0.53	U	0.46	U	0.52	U	0.85	U	0.37	U	---		---		---		---		6.1	---	8.4
Zinc	60.8	D	52.2		94.4		62.7		78.1		54		63.3		---		---		---		---		410	---	3,800
PAHs (µg/kg dry weight)																									
Naphthalene	8.9	J	9.4	J	17.6	J	9.6	J	10.2	J	18.6	U	10.1	J	16.8	J	6	J	11.3	J	13.2	J	2,100	---	2,400
Acenaphthylene	19.2	U	19.5	U	11.2	J	7.2	J	7.9	J	17.1	J	38.6		54.2		4.7	J	227		32.3		560	---	1,300
Acenaphthene	19.2	U	19.5	U	11.1	J	19.7	U	19.4	U	4.8	J	19.7	U	18.4	J	19.4	U	47.8		6.2	J	500	---	2,000
Fluorene	5.6	J	6.3	J	16.4	J	8.3	J	6.5	J	12	J	31		29.7		19.4	U	74.1		21.9		540	---	3,600
Phenanthrene	32.3		38.5		117		65.1		51.3		108		347		492		31.2		1,550		118		1,500	---	21,000
Anthracene	7.3	J	15.4	J	57.9		28		28.2		29.5		187		133		14.3	J	339		176		960	---	13,000
2-Methylnaphthalene	13	J	14.3	J	24		14.4	J	13	J	11.6	J	11.9	J	19.2	U	8	J	11.6	J	18	J	670	---	1,900
Total LPAH	93	J	109		231		138		124		190		633		744		95		2,249		368		5,200	---	29,000
Fluoranthene	32.2		56.7		233		124		170		194		1,340		2,090	E	80.1		3,840	E	388		1,700	4,600	30,000
Pyrene	33.4		53.2		202		112		144		193		1,050		1,730		89.7		3,680	E	395		2,600	11,980	16,000
Benzo(a)anthracene	15.8	J	25.8		90.1		47.5		48.4		62.5		442		346		29.6		835		233		1,300	---	5,100
Chrysene	24.5		43		152		102		96.1		146		1,080		770		65.4		2,400	E	431		1,400	---	21,000
Benzofluoranthenes (b, j ,k)	39.5		66.3		213		137		139		227		1,330		903		88.8		2,490		580		3,200	---	9,900
Benzo(a)pyrene	12.9	J	24.6		84.9		54.6		49.8		81.4		507		229		31.8		840		232		1,600	---	3,600
Indeno(1,2,3-c,d)pyrene	9.4	J	15.9	J	50.2		31.2		30.4		46.4		259		146		18.5	J	370		106		600	---	4,400
Dibenz(a,h)anthracene	5.6	Q	8.5	Q	19	Q	11.5	Q	11.2	Q	16.6	Q	93.3		49.9		7.4		131		44.6		230	---	1,900
Benzo(g,h,i)perylene	12	J	19.1	J	60.3		33.8		33.8		45.8		266		147		19.8		329		102		670	---	3,200
Total HPAH	186	JQ	313	JQ	1105	Q	654	Q	728	Q	1013	Q	6,367		6,411	E	431		14,915	E	2512		12,000	---	69,000

Makah Tribe Emergency Spill Dock | Results of Chemical Analysis Compared to DMMP Guidelines | DMMP Suitability Determination

															DMMU 7 subsamples								DMMP Criteria (dry wt)		
	DMMU-1		DMMU-2		DMMU-3		DMMU-4		DMMU-5		DMMU-6		DMMU-7		S-25		S-26		S-27		S-28		SL	BT	ML
CHLORINATED HYDROCARBONS (µg/kg dry weight)																									
1,4-Dichlorobenzene	4.8	U	4.9	U	4.9	U	4.9	U	4.8	U	4.7	U	12.6		---		---		---		---		110	---	120
1,2-Dichlorobenzene	4.8	U	4.9	U	4.9	U	4.9	U	4.8	U	4.7	U	4.9	U	---		---		---		---		35	---	110
1,2,4-Trichlorobenzene	4.8	U	4.9	U	4.9	U	4.9	U	4.8	U	4.7	U	4.9	U	---		---		---		---		31	---	64
Hexachlorobenzene (HCB)	0.94	U	2.1	J	5.8		0.84	U	0.98	U	0.97	U	0.96	U	---		---		---		---		22	168	230
PHTHALATES (µg/kg dry weight)																									
Dimethyl phthalate	19.2	U	19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	19.7	U	34.8		19.4	U	19.1	U	187		71	---	1,400
Diethyl phthalate	19.2	U	19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	19.7	U	19.2	U	19.4	U	19.1	U	19.3	U	200	---	1,200
Di-n-butyl phthalate	19.2	U	19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	12.3	J	15.4	J	19.4	U	19.1	U	19.3	U	1,400	---	5,100
Butyl benzyl phthalate	4.8	U	4.9	U	4.9	U	4.9	U	4.8	U	4.7	U	4.9	U	4.8	U	4.8	U	4.8	U	4.8	U	63	---	970
Bis(2-ethylhexyl) phthalate	47.9	U	48.7	U	74.4		49.1	U	48.5	U	46.5	U	1,120		159		48.5	U	42.9	J	40	J	1,300	---	8,300
Di-n-octyl phthalate	19.2	U	19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	1,520		19.2	U	19.4	U	19.1	U	19.3	U	6,200	---	6,200
PHENOLS (µg/kg dry weight)																									
Phenol	240		24.3		27.8		19.7	U	19.4	U	11.4	J	19.7	U	---		---		---		---		420	---	1,200
2-Methylphenol	19.2	U	19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	19.7	U	---		---		---		---		63	---	77
4-Methylphenol	23.8		19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	19.7	U	---		---		---		---		670	---	3,600
2,4-Dimethylphenol	24	U	24.3	U	24.7	U	24.6	U	24.2	U	23.3	U	24.7	U	---		---		---		---		29	---	210
Pentachlorophenol	95.9	U	97.4	U	98.6	U	98.3	U	96.9	U	93	U	98.6	U	---		---		---		---		400	504	690
MISCELLANEOUS EXTRACTABLES (µg/kg dry weight)																									
Benzyl alcohol	19.2	U	19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	19.7	U	---		---		---		---		57	---	870
Benzoic acid	192	U	195	U	197	U	197	U	194	U	186	U	197	U	---		---		---		---		650	---	760
Dibenzofuran	19.2	U	19.5	U	10	J	19.7	U	19.4	U	7.7	J	8.3	J	---		---		---		---		540	---	1,700
Hexachlorobutadiene	0.94	U	0.97	U	0.98	U	0.84	U	0.98	U	0.97	U	0.96	U	---		---		---		---		11	---	270
N-Nitrosodiphenylamine	19.2	U	19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	19.7	U	---		---		---		---		28	---	130
PESTICIDES & PCBs (µg/kg dry weight)																									
4,4'-DDD	0.94	U	0.97	U	0.98	U	0.84	U	0.98	U	0.97	U	0.96	U	---		---		---		---		16	---	---
4,4'-DDE	0.94	U	0.97	U	0.98	U	0.84	U	0.98	U	0.97	U	0.96	U	---		---		---		---		9	---	---
4,4'-DDT	0.94	U	0.97	U	0.98	U	0.84	U	0.98	U	0.97	U	2.4	U	---		---		---		---		12	---	---
sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT	0.94	U	0.97	U	0.98	U	0.84	U	0.98	U	0.97	U	2.4	U	---		---		---		---		---	50	69
Aldrin	0.47	U	0.49	U	0.49	U	0.42	U	0.49	U	0.48	U	0.48	U	---		---		---		---		9.5	---	---
Total Chlordane	0.94	U	0.97	U	0.98	U	0.84	U	0.98	U	0.97	U	0.96	U	---		---		---		---		2.8	37	---
cis-chlordane	0.47	U	0.49	U	0.49	U	0.42	U	0.49	U	0.48	U	0.48	U	---		---		---		---		---	---	---
trans-chlordane	0.47	U	0.49	U	0.49	U	0.42	U	0.49	U	0.48	U	0.48	U	---		---		---		---		---	---	---
cis-nonachlor	0.94	U	0.97	U	0.98	U	0.84	U	0.98	U	0.97	U	0.96	U	---		---		---		---		---	---	---
trans-nonachlor	0.94	U	0.97	U	0.98	U	0.84	U	0.98	U	0.97	U	0.96	U	---		---		---		---		---	---	---
oxychlordane	0.94	U	0.97	U	0.98	U	0.84	U	0.98	U	0.97	U	0.96	U	---		---		---		---		---	---	---
Dieldrin	0.94	U	0.97	U	0.98	U	0.84	U	0.98	U	0.97	U	0.96	U	---		---		---		---		1.9	---	1,700

Makah Tribe Emergency Spill Dock | Results of Chemical Analysis Compared to DMMP Guidelines | DMMP Suitability Determination

															DMMU 7 subsamples								DMMP Criteria (dry wt)		
	DMMU-1		DMMU-2		DMMU-3		DMMU-4		DMMU-5		DMMU-6		DMMU-7		S-25		S-26		S-27		S-28		SL	BT	ML
Heptachlor	0.47	U	0.49	U	0.49	U	0.42	U	0.49	U	0.48	U	0.48	U	---		---		---		---		1.5	---	270
Total PCBs Aroclors (Sum of: 1016, 1221, 1242, 1248, 1254, 1260, 1268)	6.3		10.5	P1	19.2		12.3		29.8		13.1		17.9		---		---		---		---		130	--	3,100
Total PCBs (mg/kg OC)	1		1.2		1.2		1.3		1.7		3.2		2.9		---		---		---		---		--	382	--
ORGANOMETALLIC COMPOUNDS																									
Tributyltin ion (bulk, ug/kg)	3.42	U	3.75	U	---		3.56	U	---		---		3.78	U	---		---		---		---		---	73	---
PETROLEUM HYDROCARBONS (mg/kg dry weight)																									
Gasoline Range Organics (Tol-Nap)	---		---		---		---		---		9.48	U	9.01	U	---		---		---		---		---	---	---
Diesel Range Organics (C12-C24)	---		---		---		---		---		12.8		17.1		---		---		---		---		---	---	---
Motor Oil Range Organics (C24-C38)	---		---		---		---		---		16.9		25.3		---		---		---		---		---	---	---

Notes:

Concentrations in bold red font failed DMMU guidelines and are not suitable for open-water disposal or beneficial use.

U - Analyte not detected at reported concentration

J = Estimated concentration when the value is less than ARI's established reporting limits

H = Hold time violation - Hold time was exceeded.

Q = Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)

E = The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the intial calibration (ICAL)

D = The reported value is from a dilution

P1 = The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.

Total PCB Aroclors = Sum of 1016, 1221, 1242, 1248, 1254, 1260, 1268

Total chlordane = sum of cis-chlordane, trans-chlordane, cis-nonachlor, trans-nonachlor, oxychlordane

Total LPAHs = sum of naphthalene, acenaphthene, acenaphthylene, fluorene, phenanthrene, anthracene

Total HPAHs = fluoranthene, pyrene, benzo(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)perylene

Total benzofluoranthenes = the sum of the "b," "j" and "k" isomers. The "j" isomer co-elutes with the "k" isomer, thus the concentration of the "j" isomer is included in the "k" isomer concentration.

SL = Screening Level

BT = Bioaccumulation Trigger

ML = Maximum Level

--- = not analyzed

Makah Tribe Emergency Spill Dock | Results of Chemical Analysis Compared to SMS Guidelines | DMMP Suitability Determination

	DMMU-1		DMMU-2		DMMU-3		DMMU-4		DMMU-5		DMMU-6		DMMU-7		DMMU 7 subsamples								SMS Criteria	
															S-25		S-26		S-27		S-28		SQS	CSL
CONVENTIONALS (mg/kg dry weight)																								
Total organic carbon	0.62		0.88		1.59		0.92		1.74		0.41		0.62		1.05		0.41		0.55		0.57		---	---
METALS (mg/kg dry weight)																								
Arsenic	18.20	U	6.48	U	8.83	U	7.58	U	8.72	U	14.10	U	6.15	U	---		---		---		---		57	93
Cadmium	0.55	JD	0.31		0.64		0.42		0.61		0.60		0.55		---		---		---		---		5.1	6.7
Chromium	30.1		23.7		41.6		26.8		37.6		24.1		19.1		---		---		---		---		260	270
Copper	16.6		12.5		32.5		17.0		22.4		16.5		23.0		---		---		---		---		390	390
Lead	7.36		6.97		15.00		7.97		12.20		7.93		7.68		---		---		---		---		450	530
Mercury	0.06		0.02	J	0.05		0.04		0.09		0.03		0.46		0.07		0.05		0.01		0.17		0.41	0.59
Silver	1.09	U	0.39	U	0.53	U	0.46	U	0.52	U	0.85	U	0.37	U	---		---		---		---		6.1	6.1
Zinc	60.8	D	52.2		94.4		62.7		78.1		54		63.3		---		---		---		---		410	960
PAHs (mg/kg Organic Carbon)																								
Naphthalene	1.4	J	1.1	J	1.1	J	1	J	0.6	J	4.5	U	1.6	J	1.6	J	1.5	J	2.1	J	2.3	J	99	170
Acenaphthylene	3.1	U	2.2	U	0.7	J	0.8	J	0.5	J	4.2	J	6.2		5.2		1.1	J	41.3		5.7		66	66
Acenaphthene	3.1	U	2.2	U	0.7	J	2.1	U	1.1	U	1.2	J	3.2	U	1.8	J	4.7	U	8.7		1.1	J	16	57
Fluorene	0.9	J	0.7	J	1.0	J	0.9	J	0.4	J	2.9	J	5.0		2.8		4.7	U	13.5		3.8		23	79
Phenanthrene	5.2		4.4		7.4		7.1		2.9		26.3		56.0		46.9		7.6		281.8		20.7		100	480
Anthracene	1.2	J	1.8	J	3.6		3		1.6		7.2		30.2		12.7		3.5	J	61.6		30.9		220	1,200
2-Methylnaphthalene[(1)]	2.1	J	1.6	J	1.5		1.6	J	0.7	J	2.8	J	1.9	J	1.8	U	2.0	J	2.1	J	3.2	J	38	64
Total LPAH	15.0	J	12.4	J	14.5	J	15.0	J	7.1	J	46.3	J	102.1	J	70.9		23.2		408.9	J	64.6		370	780
Fluoranthene	5.2		6.4		14.7		13.5		9.8		47.3		216.1		199.0	E	19.5		698.2	E	68.1		160	1,200
Pyrene	5.4		6.0		12.7		12.2		8.3		47.1		169.4		164.8		21.9		669.1	E	69.3		1,000	1,400
Benzo(a)anthracene	2.5	J	2.9		5.7		5.2		2.8		15.2		71.3		33.0		7.2		151.8		40.9		110	270
Chrysene	4.0		4.9		9.6		11.1		5.5		35.6		174.2		73.3		16.0		436.4	E	75.6		110	460
Benzofluoranthenes (b, j ,k)	6.4		7.5		13.4		14.9		8.0		55.4		214.5		86.0		21.7		452.7		101.8		230	450
Benzo(a)pyrene	2.1	J	2.8		5.3		5.9		2.9		19.9		81.8		21.8		7.8		152.7		40.7		99	210
Indeno(1,2,3-c,d)pyrene	1.5	J	1.8	J	3.2		3.4		1.7		11.3		41.8		13.9		4.5	J	67.3		18.6		34	88
Dibenz(a,h)anthracene	0.9	Q	1.0	Q	1.2	Q	1.3	Q	0.6	Q	4.0	Q	15.0		4.8		1.8		23.8		7.8		12	33
Benzo(g,h,i)perylene	1.9	J	2.2	J	3.8		3.7		1.9		11.2		42.9		14.0		4.8		59.8		17.9		34	88
Total HPAH	30	J	36	J	69	Q	71	Q	42	Q	247	Q	1,027		611		105	J	2,712		441		960	5,300
CHLORINATED HYDROCARBONS (mg/kg Organic Carbon)																								
1,4-Dichlorobenzene	0.8	U	0.6	U	0.3	U	0.5	U	0.3	U	1.1	U	2.0		---		---		---		---		3.1	9
1,2-Dichlorobenzene	0.8	U	0.6	U	0.3	U	0.5	U	0.3	U	1.1	U	0.8	U	---		---		---		---		2.3	2.3
1,2,4-Trichlorobenzene	0.8	U	0.6	U	0.3	U	0.5	U	0.3	U	*1.1*	*U*	0.8	U	---		---		---		---		0.81	1.8
Hexachlorobenzene (HCB)	0.2	U	0.2	J	0.4		0.1	U	0.1	U	0.2	U	0.2	U	---		---		---		---		0.38	2.3
PHTHALATES (mg/kg Organic Carbon)																								

Dimethyl phthalate	3.1	U	2.2	U	1.2	U	2.1	U	1.1	U	4.5	U	3.2	U	3.3		4.7	U	3.5	U	32.8		53	53
Diethyl phthalate	3.1	U	2.2	U	1.2	U	2.1	U	1.1	U	4.5	U	3.2	U	1.8	U	4.7	U	3.5	U	3.4	U	61	110
Di-n-butyl phthalate	3.1	U	2.2	U	1.2	U	2.1	U	1.1	U	4.5	U	2.0	J	1.5	J	4.7	U	3.5	U	3.4	U	220	1,700
Butyl benzyl phthalate	0.8	U	0.6	U	0.3	U	0.5	U	0.3	U	1.1	U	0.8	U	0.5	U	1.2	U	0.9	U	0.8	U	4.9	64
Bis(2-ethylhexyl) phthalate	7.7	U	5.5	U	4.7		5.3	U	2.8	U	11.3	U	180.6		15.1		11.8	U	7.8	J	7.0	J	47	78
Di-n-octyl phthalate	3.1	U	2.2	U	1.2	U	2.1	U	1.1	U	4.5	U	245.2		1.8	U	4.7	U	3.5	U	3.4	U	58	4,500
PHENOLS (µg/kg dry weight)																								
Phenol	240		24.3		27.8		19.7	U	19.4	U	11.4	J	19.7	U	---		---		---		---		420	1,200
2-Methylphenol	19.2	U	19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	19.7	U	---		---		---		---		63	63
4-Methylphenol	23.8		19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	19.7	U	---		---		---		---		670	670
2,4-Dimethylphenol	24	U	24.3	U	24.7	U	24.6	U	24.2	U	23.3	U	24.7	U	---		---		---		---		29	29
Pentachlorophenol	95.9	U	97.4	U	98.6	U	98.3	U	96.9	U	93	U	98.6	U	---		---		---		---		360	690
MISCELLANEOUS EXTRACTABLES																								
Benzyl alcohol (µg/kg dry weight)	19.2	U	19.5	U	19.7	U	19.7	U	19.4	U	18.6	U	19.7	U	---		---		---		---		57	73
Benzoic acid (µg/kg dry weight)	192	U	195	U	197	U	197	U	194	U	186	U	197	U	---		---		---		---		650	650
Dibenzofuran (mg/kg OC)	3.1	U	2.2	U	0.6	J	2.1	U	1.1	U	1.9	J	1.3	J	---		---		---		---		15	58
Hexachlorobutadiene (mg/kg OC)	0.2	U	0.1	U	0.1	U	0.1	U	0.1	U	0.2	U	0.2	U	---		---		---		---		3.9	6.2
N-Nitrosodiphenylamine (mg/kg OC)	3.1	U	2.2	U	1.2	U	2.1	U	1.1	U	4.5	U	3.2	U	---		---		---		---		11	11
Total PCB Aroclors (mk/kg OC)	1.0		1.2		1.2		1.3		1.7		3.2		2.9		---		---		---		---		12	65

Notes:

Concentrations in bold red font exceed SQS guidelines and are not suitable for beneficial use.

Concentrations in bold red font and orange shading do not meet CSL guidelines and are not suitable for beneficial use.

Undetected concentrations in italicized bold red font exceed SQS guidelines.

SMS = Sediment Management Standards (February 2013)

SQS = Sediment Quality Standard

CSL = Cleanup Screening Levels

LPAH = low molecular weight polynuclear aromatic hydrocarbon compounds

HPAH = high molecular weight polynuclear aromatic hydrocarbon compounds

TOC = Total organic carbon

Total LPAH = The sum of acenaphthylene, acenaphthene, anthracene, fluorene, naphthalene and phenanthrene.

Total HPAH = The sum of benzo(a)anthracene, benzo(a)pyrene, total benzofluoranthenes, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3,-c,d)pyrene and pyrene

Total benzofluoranthenes = the sum of the "b," "j" and "k" isomers. The "j" isomer co-elutes with the "k" isomer, thus the concentration of the "j" isomer is included in the "k" isomer concentration

U - Analyte not detected at reported concentration

Q = Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)

J = Estimated concentration when the value is less than ARI's established reporting limits

E = The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the intial calibration (ICAL)

--- = not analyzed

PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

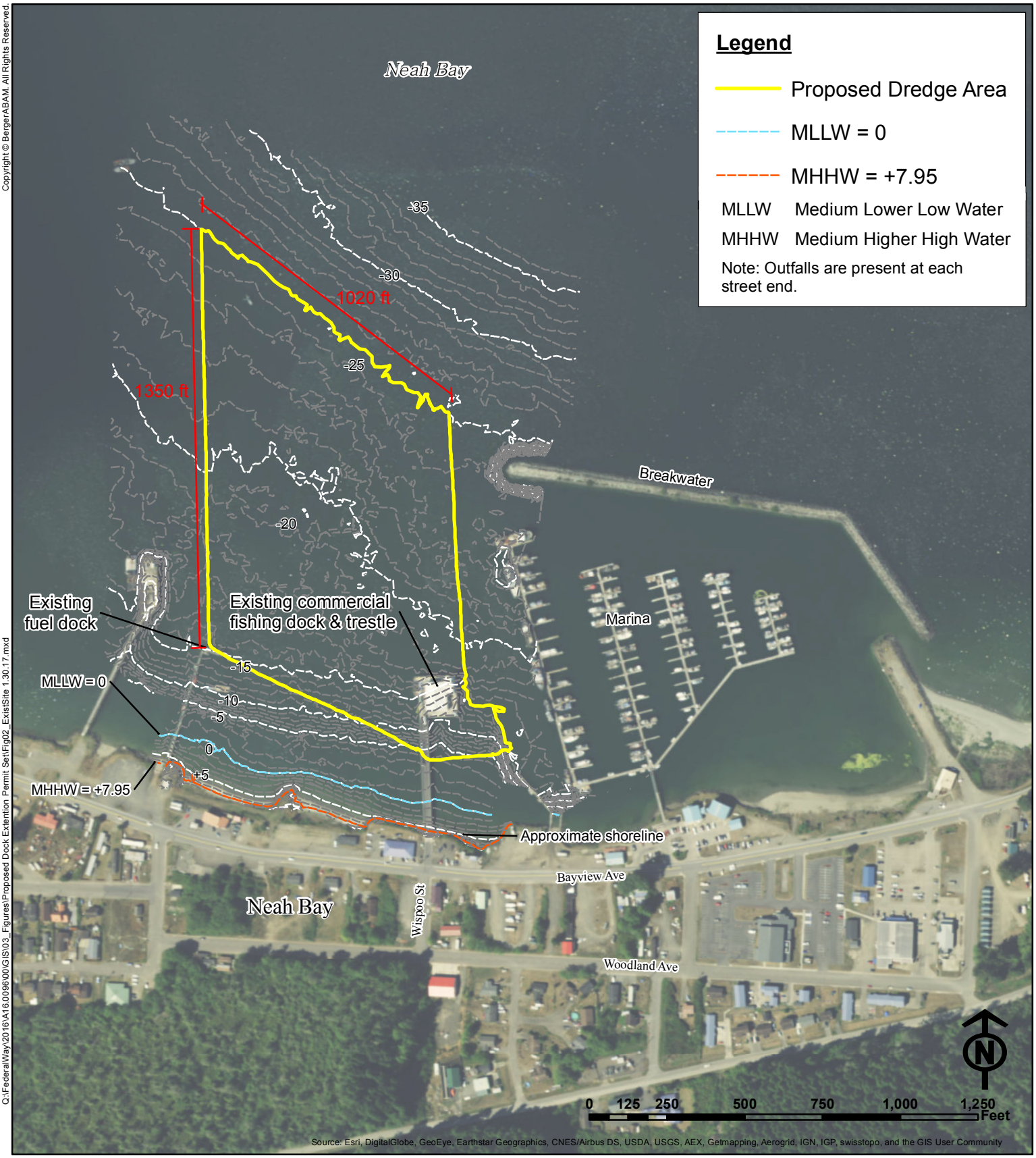
PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

Figure 1. Project Vicinity

REFERENCE: NWS-2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay. Dredging is required to accommodate vessels.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

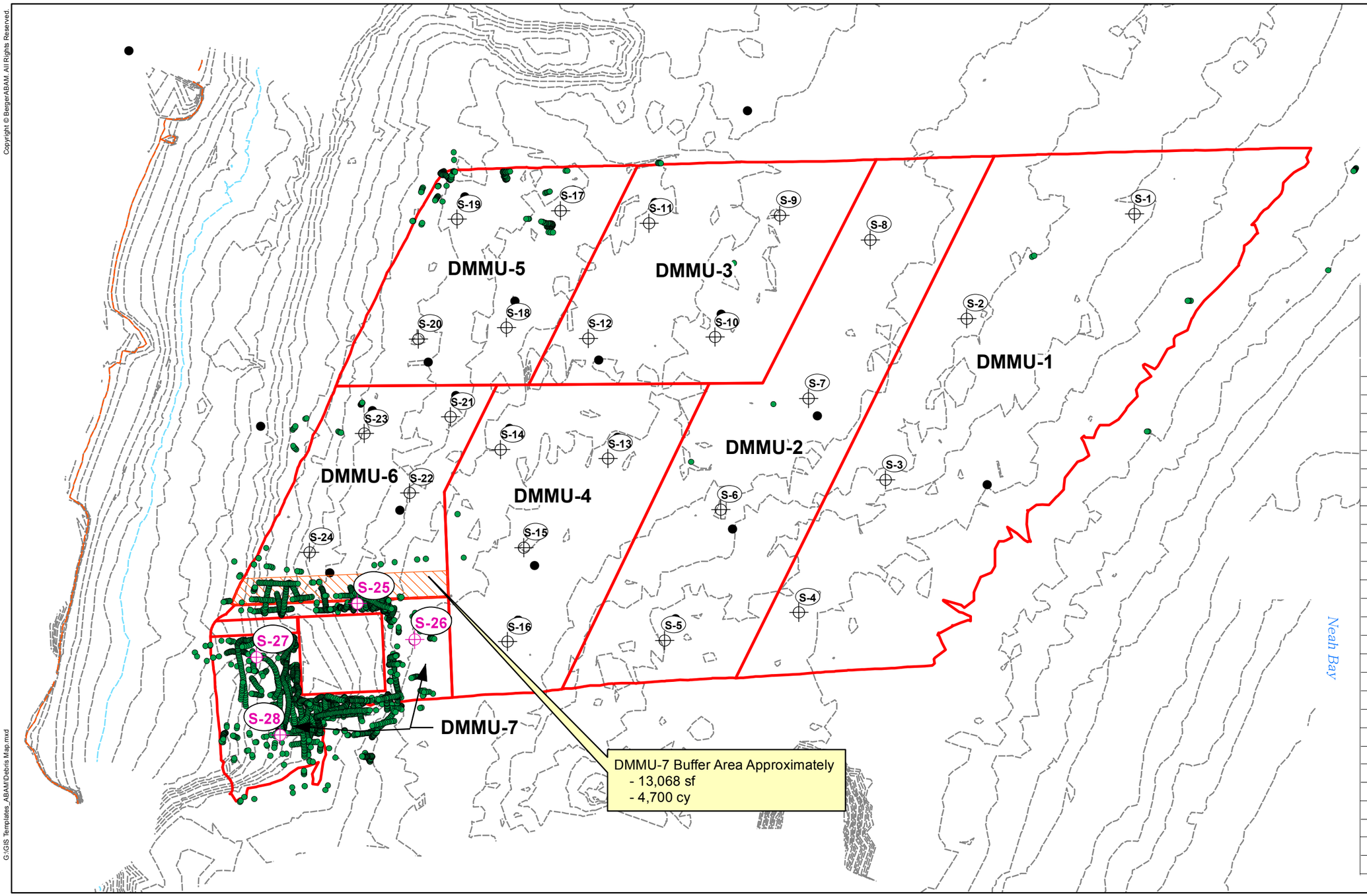
PORT OF NEAH BAY

PROPOSED DOCK EXTENSION

Figure 2. Project Area Details

REFERENCE: NWS-2016-826
WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: 16 March 2017



Legend

- DMMU 7 Buffer
- Debris Location
- DMMU Boundary
- MLLW = 0
- MHHW = +7.95
- Existing Contour
- S-20 DMMU Sub Sample Locations
- S-25 DMMU-7 Sub Sample Location

Sample ID[1]	Northing[2]	Easting[2]
S-1	522599.41	721118.52
S-2	522338.53	721278.71
S-3	522211.50	721526.42
S-4	522076.18	721731.22
S-5	521868.41	721772.38
S-6	521956.54	721571.43
S-7	522093.51	721400.31
S-8	522190.44	721155.75
S-9	522051.21	721116.85
S-10	521949.58	721304.46
S-11	521848.89	721127.36
S-12	521753.59	721305.15
S-13	521783.08	721490.90
S-14	521617.10	721476.04
S-15	521651.74	721627.71
S-16	521625.40	721772.95
S-17	521712.24	721107.34
S-18	521627.72	721287.53
S-19	521552.34	721119.78
S-20	521491.09	721304.29
S-21	521539.89	721425.13
S-22	521476.01	721541.82
S-23	521406.57	721450.00
S-24	521320.59	721632.41
S-25	521393.89	721712.53
S-26	521482.26	721767.89
S-27	521237.51	721794.09
S-28	521273.17	721914.74

G:\GIS Templates_ABAM\Debris Map.mxd

PURPOSE: Construct an extension to the existing commercial fishing dock to provide adequate, dedicated infrastructure to support an enhanced oil spill prevention and response capacity in Neah Bay.

APPLICANT: Makah Tribe
SITE OWNER: Makah Tribe

ADJACENT PROPERTY OWNERS:
Department of Natural Resources

PORT OF NEAH BAY

MAKAH TRIBE EMERGENCY SPILL
DOCK EXTENSION DREDGED
MATERIAL CHARACTERIZATION

Figure 4. DMMUs with debris locations and buffer area.

WATERWAY: Neah Bay
AT: Neah Bay
COUNTY: Clallam

LAT/LONG: 48.36746 N/-124.61416 W
S/T/R: S11/T33N/R15W
DATUM: MLLW=0.0
DATE: June 2016

N
0 80 160 320
Feet
1 inch = 154.71 feet

Appendix C
Burned Derelict Dock Photographs

APPENDIX C
BURNED DERELICT DOCK PHOTOGRAPHS

Photo 1. Aerial view of burned derelict dock contained in log boom.

Photo 2. Icehouse and associated structures (on a barge) located on the northern end of the derelict dock.

Photo 3. View of the remaining derelict dock facing southeast.

Photo 4. View from the east of the burned portion of the derelict dock near the intersection of the trestle and dock platform.

Appendix D
Marine Mammal Monitoring Plan

APPENDIX D
MARINE MAMMAL MONITORING PLAN
MAKAH INDIAN TRIBE EMERGENCY SPILL RESPONSE DOCK EXTENSION CONSTRUCTION PROJECT

1.0 INTRODUCTION

This marine mammal monitoring plan (MMMP) has been prepared for the Makah Indian Tribe (Tribe) to use during pile installation associated with the construction of the spill response dock extension. The new extension will be supported by up to 220 steel pipe piles—eighty-five 24-inch-diameter piles and one hundred thirty-five 18-inch-diameter piles (Sheets 3 through 5). The project will result in moorage for the emergency spill response vessels staged in Neah Bay, Washington, on tribal land. Project details are shown in Sheets 1 through 9. As described in the biological evaluation for the project, pile driving has the potential to impact Endangered Species Act (ESA)-listed marine mammal species. This monitoring plan has been developed to minimize impacts to ESA-listed marine mammals during construction activities.

Installation of the steel pipe pile will be completed with both vibratory and impact driving methods. A vibratory hammer or excavator type of equipment will be used for all pile removal and for installation of steel piles to the greatest extent possible. The project will use an impact hammer primarily for proofing structural load capacity of steel piles. If necessary, impact driving may be necessary following vibratory driving to refusal (the point at which the pile will no longer advance with the vibratory hammer) if the pile does not reach the design tip elevation. It is anticipated that approximately 25 percent of the piles (55 piles) will be proofed. It may be necessary to impact drive some piles to reach the designated penetration depth if very dense soils are encountered. A conservative estimate has been made that up to 1,000 strikes per day may be necessary to impact drive piles to their final tip elevation.

Underwater noise levels within portions of the project area could temporarily exceed the noise thresholds established by National Oceanic and Atmospheric Administration (NOAA) Fisheries to prevent the underwater disturbance of ESA-listed marine mammals during vibratory and impact driving of steel piles. A bubble curtain will be required during all in-water impact driving of steel pipe pile. This monitoring plan conservatively assumes that use of a bubble curtain will reduce underwater noise levels by 6 dB during impact pile-driving activities. This plan refers to these portions of the action area as the "impact monitoring area" and the "vibratory monitoring area" (Sheets 13 through 14).

All in-water pile removal and installation will be conducted during the agency-established in-water work window for marine waters of Tidal Reference Area 10 where bull trout are potentially present (16 July to 15 February). Southern Resident DPS orca whale (*Orcinus orca*), listed as threatened under the ESA, could potentially be present

within portions of the monitoring area during the time when pile installation and/or removal is being conducted, as described in the biological evaluation completed for the project.

This MMMP will be conducted during all steel pile installation and removal activities for the project. As described in the plan, no pile installation or removal will be conducted if ESA-listed marine mammals are present within the monitoring areas.

2.0 MONITORING AREAS

Marine mammal monitoring will occur within two areas as established by NOAA Fisheries guidance on the effects of underwater sound on marine mammals, depending on the type of hammer used (Table 1). The Port will require the use of a bubble curtain during all impact hammer activities to reduce the amount of underwater noise generated during construction. This analysis assumes a 6 dB reduction will be achieved by the bubble curtain.

Table 1. Summary of Hammer Noise Levels Used for Calculating Monitoring Zones

Driving Method	Pile Size/Material	Measured Noise Levels (dB) at 10m[a]		
		Peak	SEL	RMS
Vibratory	18- to 24-inch Steel Pipe	185	175	176
Impact (unattenuated)	18- to 24-inch Steel Pipe	207	178	194
Impact (attenuated)	18- to 24-inch Steel Pipe	201	172	188

[a]- Noise information compiled from Caltrans 2012.

SEL = sound energy level; RMS = root mean square

Monitoring will be conducted for Level A and Level B harassment areas. Table 2 shows the Level A underwater injury and disturbance thresholds that NOAA Fisheries has established for marine mammals. Table 3 depicts the criteria for Level B harassment. Humpback whales are considered to be Low-Frequency Cetaceans and orca are Mid-Frequency Cetaceans. In order to account for all ESA-listed species, the distances for Low-Frequency Cetaceans will be used to establish monitoring areas as they are more restrictive.

Table 2. Level A Harrassment Threshold Decibel Levels (Permanent Temporal Shift [PTS]) for Marine Mammals

Marine Mammal Hearing Group	Impulsive Sounds (impact driving)	Non-impulsive Sounds (vibratory driving)
Low-Frequency (LF) Cetaceans	219 dBpk 183 dBLe	199 dBpk
Mid-Frequency (MF) Cetaceans	230 dBpk 185 dBLe	198 dBpk
High-Frequency (HF) Cetaceans	202 dBpk 155 dBLe	173 dBpk

Marine Mammal Hearing Group	Impulsive Sounds (impact driving)	Non-impulsive Sounds (vibratory driving)
Phocid Pinnipeds (PW) (Underwater)	218 dBpk 185 dBLe	201 dBpk
Otariid Pinnipeds (OW) (Underwater)	232 dBpk 203 dBLe	219 dBpk

Source: NOAA Fisheries 2016
dBpk - peak noise level
dBLe - cumulative noise level averaged over a 24-hr period

Table 3.Level B Harrassment Threshold Decibel Levels for Marine Mammals

Criterion	Criterion Definition	Threshold*
Level B Harassment	Behavioral disruption for impulsive noise (e.g., impact pile driving)	160 dB_{RMS}
Level B Harassment	Behavioral disruption for non-pulse noise (e.g., vibratory pile driving, drilling)	120** dB_{RMS}

All decibel levels referenced to 1 micropascal (re: 1 µPa). Note: all thresholds are based off root mean square (RMS) levels.
* PTS=Permanent Threshold Shift; TTS=Temporary Threshold Shift
**The 120 dB threshold may be adjusted slightly if background noise levels are at or above this level.

2.1 Impact Pile-Driving Monitoring Area

The Level A harassment threshold for ESA-listed marine mammal species could be exceeded during impact pile-driving/proofing activities at various distances for each hearing group (Table 4). The analysis in Section 3.7.2.1 of the biological evaluation (BergerABAM 2017) indicates that 172 dB_{SEL} is a conservative estimate of the sound levels likely to be produced during impact pile driving of 24-inch steel pile, including a 6 dB reduction from the use of a bubble curtain. In order to protect ESA-listed species, an impact monitoring zone of 185 meters has been established for the Level A impacts during impact pile driving (Sheet 13).

Table 4. Monitoring Distance Threshold for Level A Harassment to Marine Mammals during Impact Pile Driving

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	183	185	155	185	203
PTS Isopleth to threshold (meters)	184.5	6.6	219.8	98.8	7.2

Source: NOAA Fisheries 2016, single strike SEL method

Level B harassment is defined as the area where under water noise exceeds 160 dB_{RMS} for impact driving. Underwater noise generated by impact hammers for the modeled 24-inch steel pipe pile would result in an attenuated noise level of 188 dB_{RMS}. It would take approximately 736 meters for cumulative noise to attenuate to below 160 dB_{RMS} under the maximum scenario of 1,000 strikes per day (Sheet 13).

2.2 Vibratory Driving Monitoring Area

The analysis in Section 3.7.2.2 of the biological evaluation (BergerABAM 2017) indicates that 176 dB_{RMS} is a conservative estimate of the sound levels likely to be produced during

vibratory pile removal and installation of up to 24-inch-diameter steel pile. In order to account for all potential ESA-listed marine mammals, a vibratory monitoring zone of 68.3 meters has been established for the Level A impacts (Sheet 14).

Table 5. Monitoring Distance Threshold for Level A Harrasment to Marine Mammals during Vibratory Pile Driving

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	199	198	173	201	219
PTS Isopleth to threshold (meters)	68.3	6.1	101.0	41.5	2.9

Source: NOAA Fisheries 2016

Level B harassment is defined as the area where under water noise exceeds 120 dB_{RMS}. As described in the BE (Section 3.7.2), background noise levels within the project area is assumed to be 120 dB. The Level B monitoring area for vibratory driving is 54,116 meters. Attenuation will actually occur much sooner, because sound waves travel in straight lines and the monitoring area is constrained by existing jetties, breakwaters, and other land masses that effectively block propagation of underwater noise.

The Level A and Level B areas will be monitored according to the protocol described in this plan for any in-water pile installation or removal activity associated with this project. These monitoring areas will be maintained as injury and disturbance protection zones to prevent injury to, or disturbance of ESA-listed marine mammals. Pile-driving activities will be shut down immediately if any marine mammals are observed within or entering the Levels A or B monitoring area.

2.3 Monitoring Protocol

A marine mammal monitoring coordinator (MC) will schedule monitoring activities in accordance with project activities. If no pile driving is scheduled, marine mammal monitoring will not occur. If pile-driving activities are planned, the MC will coordinate with the construction manager to determine where the project activities will occur, the methods of installation (vibratory and/or impact), and the plan for marine mammal monitoring areas.

2.3.1 Impact Monitoring

Marine mammal monitoring will be for impact pile-driving activities by a single qualified biologist (see Section 2.4). Marine mammal monitoring during the project will consist of the following procedures.

- Qualified biologists, or other trained marine mammal observers who meet the list of qualifications for marine mammal observers, will be present on site (on land or dock) at all times during impact pile-driving activities. One biologist is needed to cover all monitoring zones because the Level A zone is larger than the Level B zone.

- The MC will be located at the project area and will have direct access to the construction manager and pile driver. The MC will coordinate with observers through hand-held radios or cellular phones.

- The observer will be based on land or on the dock during all pile-driving activities. This individual will be stationed in the general vicinity of the pile being driven and will have clear line-of-sight views of the entire area within which temporary effects can be expected, up to 525 feet (160 meters) for Level A harassment.

- In the event of a Beaufort Sea state of 5 or above (17 to 22 knots wind speed), or if visibility is less than 1 mile, pile driving will cease and will not resume until conditions in the monitoring area reach acceptable levels.

- The observers will scan the waters within the monitoring areas using binoculars (10X42 or equivalent), spotting scopes (20 to 60 zoom or equivalent), and unaided visual observation. The waters will be scanned 20 minutes before pile-driving activities begin and during all pile-driving activities. If any ESA-listed marine mammals enter or are observed within the impact temporary effect area (during impact pile driving) or the vibratory temporary effect area (during vibratory pile driving) during or 20 minutes prior to pile driving, the observers will notify the on-site construction manager. That individual will be responsible for ensuring that work does not begin, or that work stops until the animal has moved outside the designated radius, or until it has not been observed within the action area for a period of 20 minutes.

- All observations of ESA-listed marine mammals will be documented in marine mammal observation forms.

2.3.2 Vibratory Monitoring

Marine mammal monitoring during vibratory driving will be similar to the methods outlined for impact driving, with the exception of the following changes for Level B monitoring areas. Level B monitoring areas will be established in the annual work plans depending on the location and size of piles proposed for vibratory driving (see Table 5).

One qualified biologist will be stationed in close proximity to monitor for marine mammals within the Level A area, 770 feet (235 meters), using the same protocol as described for impact monitoring.

Marine mammal monitoring will occur in collaboration with the Whale Museum for vibratory driving. The Whale Museum manages the largest database of daily whale sightings in Puget Sound. The MC will conduct daily online checks when any vibratory driving activity is planned to monitor the locations of southern resident orca using local, up-to-date sightings data in Port Gardner and North Puget Sound, from the south end of Whidbey Island north to all of Port Susan and the west side of Camano Island (Saratoga Passage). The MC will check the website (http://www.whalemuseum.org/hotlinefolder/update.html) and/or contact the

museums biologist to obtain the latest location of whales. If it is determined that whales have been observed within the Level B monitoring area during the week preceding proposed work activities, the MC will contact NOAA Fisheries to determine appropriate monitoring protocols for the Level B area.

A log of the whales' locations will be maintained and submitted to NOAA Fisheries one week prior to vibratory pile-driving operations to ascertain the location and movements of the whales to determine monitoring requirements with NOAA Fisheries. If Southern Resident orca or humpback whale have been recently sighted in the Level B area, or are approaching these areas, the MC will coordinate directly with the Whale Museum in an effort to confirm whether whales are still in the area. If whales are still in the general area of the Level B area, the MC will

- Consult with NOAA Fisheries to determine locations (vessel or land) to dispatch qualified field observers to monitor the appropriate Level B areas for marine mammals.

- Coordinate with observers to determine if the Level B area is clear of marine mammals before pile-driving operations begin.

- Notify the Port of Everett and the on-site supervisor (or the construction contractor) and provide a briefing of the location of the whales. The pile-driving contractor will be instructed to not initiate pile driving until the whales have moved outside of the Level B area. Field observers will verify that the Level B area is clear of ESA-listed marine mammals before pile driving will commence.

2.4 Minimum Qualifications for Marine Mammal Observers

- Visual acuity in both eyes (correction is permissible) sufficient to discern moving targets at the water's surface with the ability to estimate target size and distance. Use of binoculars may be necessary to correctly identify the target.

- Experience and ability to conduct field observations and collect data according to assigned protocols; this qualification may include academic experience.

- Experience or training in identifying marine mammals in the field.

- Sufficient training, orientation, or experience with the construction operation for personal safety during observations.

- Writing skills sufficient to prepare a report of observations that includes such information as the number and types of marine mammals observed, their behavior in the project area during construction, the dates and times when observations were conducted, the dates and times when in-water construction activities were conducted, the dates and times when marine mammals were present at or within the defined temporary effect areas, and the dates and times when in-water construction

activities were suspended to avoid incidental harassment by disturbance from construction noise, etc.

- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the temporary effect areas.

Appendix E
Species List

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CRITICAL HABITAT; CANDIDATE SPECIES; AND SPECIES OF CONCERN
IN CLALLAM COUNTY
AS PREPARED BY
THE U.S. FISH AND WILDLIFE SERVICE
WASHINGTON FISH AND WILDLIFE OFFICE

(Revised April 24, 2013)

LISTED

Bull trout *(Salvelinus confluentus)*
Marbled murrelet *(Brachyramphus marmoratus)*
Northern spotted owl *(Strix occidentalis caurina)*
Short-tailed albatross *(Phoebastria albatrus)* [outer coast]

Major concerns that should be addressed in your Biological Assessment of project impacts to listed animal species include:

1. Level of use of the project area by listed species.

2. Effect of the project on listed species' primary food stocks, prey species, and foraging in all areas influenced by the project.

3. Impacts from project activities and implementation (e.g., increased noise levels, increased human activity and/or access, loss or degradation of habitat) that may result in disturbance to listed species and/or their avoidance of the project area.

DESIGNATED

Critical habitat for bull trout
Critical habitat for the marbled murrelet
Critical habitat for the northern spotted owl

PROPOSED

Dolly Varden *(Salvelinus malma)* similarity of appearance
Taylor’s checkerspot butterfly *(Euphydryas editha taylori)*
Critical habitat for Taylor’s checkerspot butterfly

CANDIDATE

Fisher *(Martes pennanti)* – West Coast DPS
Pinus albicaulis (whitebark pine)

SPECIES OF CONCERN

Bald eagle *(Haliaeetus leucocephalus)*
Brown pelican *(Pelecanus occidentalis)* [outer coast]
Cascades frog *(Rana cascadae)*
Cassin's auklet *(Ptychoramphus aleuticus)*
Long-eared myotis *(Myotis evotis)*
Long-legged myotis *(Myotis volans)*
Makah's copper *(Lycaena mariposa charlottensis)*
(Olympic) Mazama pocket gopher *(Thomomys mazama* ssp. *melanops)*
Northern goshawk *(Accipiter gentilis)*
Northern sea otter *(Enhydra lutris kenyoni)*
Olive-sided flycatcher *(Contopus cooperi)*
Oregon vesper sparrow *(Pooecetes gramineus affinis)*
Pacific lamprey *(Lampetra tridentata)*
Pacific Townsend's big-eared bat *(Corynorhinus townsendii townsendii)*
Peregrine falcon *(Falco peregrinus)*
Olympic torrent salamander *(Rhyacotriton olympicus)*
River lamprey *(Lampetra ayresi)*
Tailed frog *(Ascaphus truei)*
Tufted puffin *(Fratercula cirrhata)*
Valley silverspot *(Speyeria zerene bremeri)*
Van Dyke's salamander *(Plethodon vandykei)*
Western toad *(Bufo boreas)*
Astragalus australis var. *olympicus* (Cotton's milk vetch)
Cimicifuga elata (tall bugbane)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington Fish and Wildlife Office
510 DESMOND DRIVE SE, SUITE 102
LACEY, WA 98503
PHONE: (360)753-9440 FAX: (360)753-9405
URL: www.fws.gov/wafwo/

Consultation Code: 01EWFW00-2016-SLI-0833 May 20, 2016
Event Code: 01EWFW00-2016-E-00930
Project Name: Makah Tribe Dock Extension

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated and proposed critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. The species list is currently compiled at the county level. Additional information is available from the Washington Department of Fish and Wildlife, Priority Habitats and Species website: http://wdfw.wa.gov/mapping/phs/ or at our office website: http://www.fws.gov/wafwo/species_new.html. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether or not the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species, and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:
http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). You may visit our website at http://www.fws.gov/pacific/eagle/for information on disturbance or take of the species and information on how to get a permit and what current guidelines and regulations are. Some projects affecting these species may require development of an eagle conservation plan: (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Also be aware that all marine mammals are protected under the Marine Mammal Protection Act (MMPA). The MMPA prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas. The importation of marine mammals and marine mammal products into the U.S. is also prohibited. More information can be found on the MMPA website: http://www.nmfs.noaa.gov/pr/laws/mmpa/.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Related website:
National Marine Fisheries Service:
http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Makah Tribe Dock Extension

Official Species List

Provided by:

Washington Fish and Wildlife Office
510 DESMOND DRIVE SE, SUITE 102
LACEY, WA 98503
(360) 753-9440
http://www.fws.gov/wafwo/

Consultation Code: 01EWFW00-2016-SLI-0833
Event Code: 01EWFW00-2016-E-00930

Project Type: SHORELINE USAGE FACILITIES / DEVELOPMENT

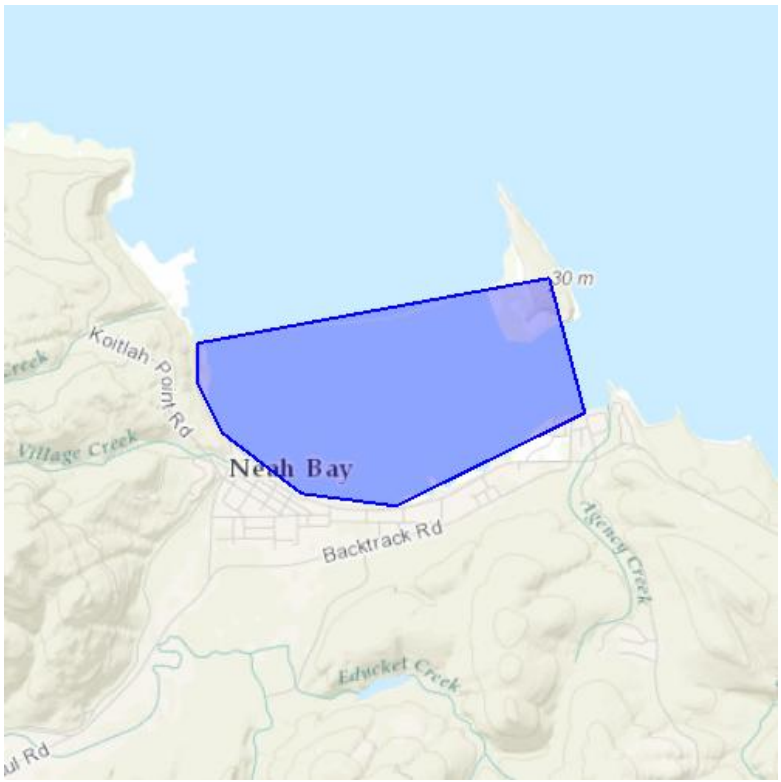
Project Name: Makah Tribe Dock Extension
Project Description: The project consists of construction of an extension to the existing commercial fishing dock to accommodate an emergency response towing vessel (ERTV) and associated spill response vessels that are currently moored at the nearby Neah Bay Marina. The proposed dock would provide a permanent mooring location for the vessels and allow greater functionality for vessel loading and unloading operations. The proposed extension and associated finger piers will be constructed as fixed structures on piling installed to the west of the existing commercial fishing dock.
The proposed dock will extend at an angle from the existing commercial fishing dock approximately 563 feet to the northwest. Two finger piers will extend to the north approximately 325 feet and 340 feet to the north from the angled dock extension. The proposed dock will connect to the existing fishing dock trestle approximately 40 feet south of fishing dock. Three floating docks for berthing small crafts will be located on the north and south sides of the angled dock extension. The floating docks will be approximately 310 feet long (south side of extension) and two approximately 180 feet long floating docks located on the north side of the dock extension.
The new dock extension will be constructed on steel piles with decking surfaced in concrete with an asphalt pavement overlay. The new dock extension will be supported by up to 220 steel pipe piles including eighty-five 24.5-inch diameter piles and one hundred thirty-five 18.5-inch diameter piles. A maximum of approximately 185,100 cubic yards of material will be dredged from project area. The project will require dredging to increase the depth of the berth area to elevations ranging from -15 to -25 feet mean lower low water (MLLW) to accommodate the drafts of the spill response vessels that will be moored there. An area extending to the north will also be dredge to complete a

channel with mudline elevation of -25 feet MLLW to the Neah Bay basin to allow for passage of the design vessels.

The proposed project is planned for the in-water work window for the area (16 July through 15 February) in 2017 through 2018.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-124.63027954101562 48.37654917252816, -124.59646224975585 48.3805968287748, -124.5931577682495 48.37204506407198, -124.61118221282959 48.36614350889047, -124.6202802658081 48.36694182688461, -124.62787628173827 48.3707906844581, -124.63019371032715 48.3739265755548, -124.63027954101562 48.37654917252816)))

Project Counties: Clallam, WA

Endangered Species Act Species List

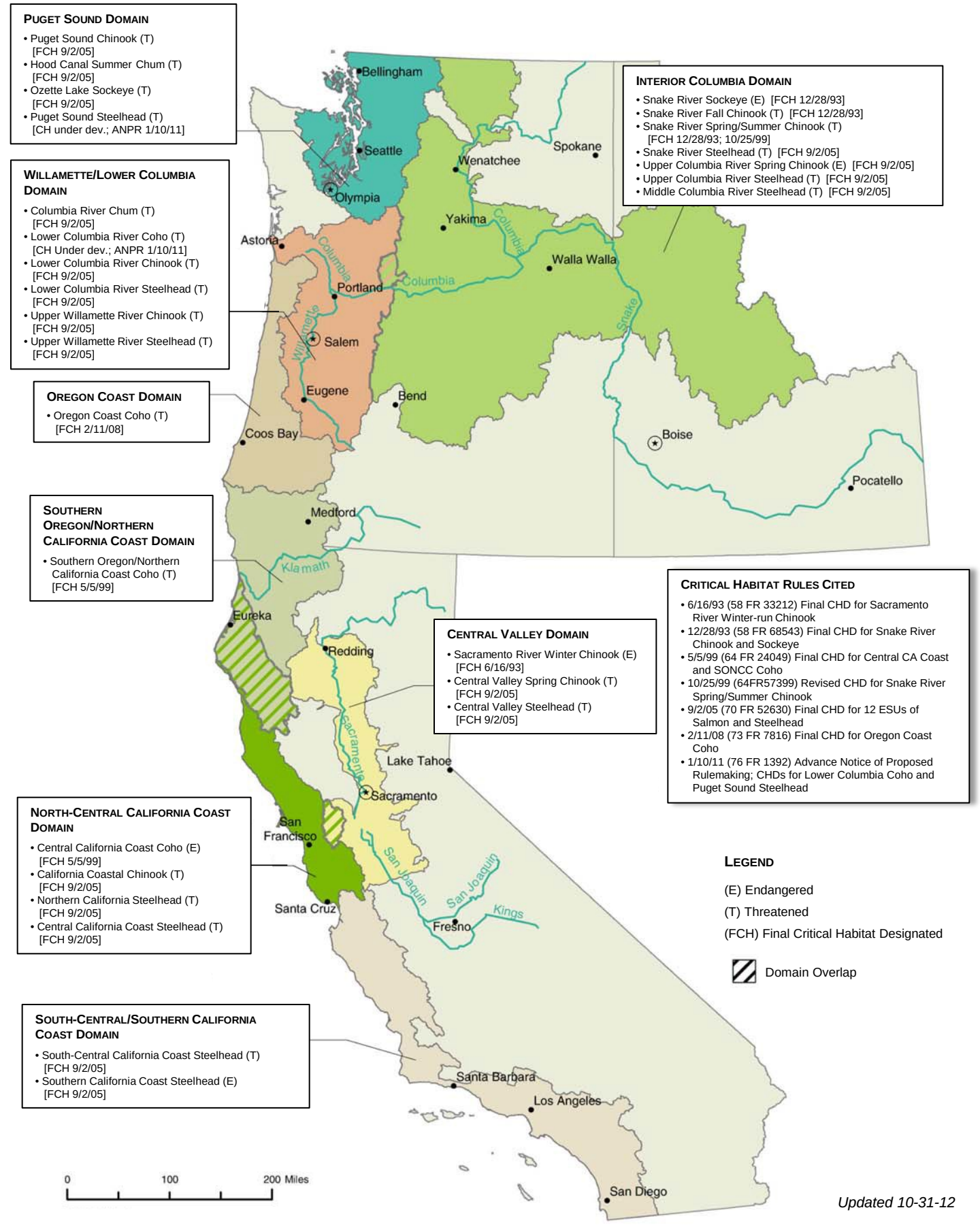
There are a total of 6 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	**Status**	**Has Critical Habitat**	**Condition(s)**
Marbled murrelet *(Brachyramphus marmoratus)* Population: CA, OR, WA	Threatened	Final designated	
Short-Tailed albatross *(Phoebastria (=diomedea) albatrus)* Population: Entire	Endangered		
Streaked Horned lark *(Eremophila alpestris strigata)*	Threatened	Final designated	
Yellow-Billed Cuckoo *(Coccyzus americanus)* Population: Western U.S. DPS	Threatened	Proposed	
Fishes			
Bull Trout *(Salvelinus confluentus)* Population: U.S.A., conterminous, lower 48 states	Threatened	Final designated	
Dolly Varden *(Salvelinus malma)*	Proposed Similarity of Appearance (Threatened)		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Status of ESA Listings & Critical Habitat Designations for West Coast Salmon & Steelhead



PUGET SOUND DOMAIN

- Puget Sound Chinook (T) [FCH 9/2/05]
- Hood Canal Summer Chum (T) [FCH 9/2/05]
- Ozette Lake Sockeye (T) [FCH 9/2/05]
- Puget Sound Steelhead (T) [CH under dev.; ANPR 1/10/11]

WILLAMETTE/LOWER COLUMBIA DOMAIN

- Columbia River Chum (T) [FCH 9/2/05]
- Lower Columbia River Coho (T) [CH Under dev.; ANPR 1/10/11]
- Lower Columbia River Chinook (T) [FCH 9/2/05]
- Lower Columbia River Steelhead (T) [FCH 9/2/05]
- Upper Willamette River Chinook (T) [FCH 9/2/05]
- Upper Willamette River Steelhead (T) [FCH 9/2/05]

OREGON COAST DOMAIN

- Oregon Coast Coho (T) [FCH 2/11/08]

SOUTHERN OREGON/NORTHERN CALIFORNIA COAST DOMAIN

- Southern Oregon/Northern California Coast Coho (T) [FCH 5/5/99]

NORTH-CENTRAL CALIFORNIA COAST DOMAIN

- Central California Coast Coho (E) [FCH 5/5/99]
- California Coastal Chinook (T) [FCH 9/2/05]
- Northern California Steelhead (T) [FCH 9/2/05]
- Central California Coast Steelhead (T) [FCH 9/2/05]

SOUTH-CENTRAL/SOUTHERN CALIFORNIA COAST DOMAIN

- South-Central California Coast Steelhead (T) [FCH 9/2/05]
- Southern California Coast Steelhead (E) [FCH 9/2/05]

INTERIOR COLUMBIA DOMAIN

- Snake River Sockeye (E) [FCH 12/28/93]
- Snake River Fall Chinook (T) [FCH 12/28/93]
- Snake River Spring/Summer Chinook (T) [FCH 12/28/93; 10/25/99]
- Snake River Steelhead (T) [FCH 9/2/05]
- Upper Columbia River Spring Chinook (E) [FCH 9/2/05]
- Upper Columbia River Steelhead (T) [FCH 9/2/05]
- Middle Columbia River Steelhead (T) [FCH 9/2/05]

CENTRAL VALLEY DOMAIN

- Sacramento River Winter Chinook (E) [FCH 6/16/93]
- Central Valley Spring Chinook (T) [FCH 9/2/05]
- Central Valley Steelhead (T) [FCH 9/2/05]

CRITICAL HABITAT RULES CITED

- 6/16/93 (58 FR 33212) Final CHD for Sacramento River Winter-run Chinook
- 12/28/93 (58 FR 68543) Final CHD for Snake River Chinook and Sockeye
- 5/5/99 (64 FR 24049) Final CHD for Central CA Coast and SONCC Coho
- 10/25/99 (64FR57399) Revised CHD for Snake River Spring/Summer Chinook
- 9/2/05 (70 FR 52630) Final CHD for 12 ESUs of Salmon and Steelhead
- 2/11/08 (73 FR 7816) Final CHD for Oregon Coast Coho
- 1/10/11 (76 FR 1392) Advance Notice of Proposed Rulemaking; CHDs for Lower Columbia Coho and Puget Sound Steelhead

LEGEND

(E) Endangered

(T) Threatened

(FCH) Final Critical Habitat Designated

Domain Overlap

Updated 10-31-12

Appendix F
Essential Fish Habitat

APPENDIX F
ESSENTIAL FISH HABITAT

Public Law 104-297, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for Essential Fish Habitat (EFH) descriptions in federal fishery management plans and to require federal agencies to consult with NMFS on activities that may adversely affect EFH.

The Magnuson-Stevens Act requires consultation for all federal agency actions that may adversely affect EFH. The action area is within designated EFH for Pacific salmon, groundfish, and coastal pelagic species.

EFH for Pacific salmon in freshwater includes all streams, lakes, ponds, wetlands, and other currently viable bodies of freshwater and the substrates within those waterbodies accessible to Pacific salmon. Activities occurring above impassable barriers that are likely to adversely affect EFH below impassable barriers are subject to the consultation provisions of the Magnuson-Stevens Act. Designated EFH for salmonid species in estuarine and marine areas includes nearshore and tidally submerged environments within state territorial water out to the full extent of the exclusive economic zone (370.4 km) offshore from Washington (PFMC 1999)[1].

EFH for groundfish and coastal pelagic species includes all waters from the mean high water line along the coasts of Washington upstream to the extent of saltwater intrusion and seaward to the boundary of the U.S. exclusive economic zone (370.4 km) (PFMC 1998a[2] and 1998b[3]).

The Magnuson-Stevens Act requires consultation for all federal agency actions that may adversely affect EFH. EFH consultation with National Oceanic and Atmospheric Administration (NOAA) Fisheries is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of its location. Under Section 305(b)(4) of the Magnuson-Stevens Act, NOAA Fisheries is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Wherever possible, NOAA Fisheries uses existing interagency coordination processes to fulfill EFH consultations with federal agencies. For the proposed action, this goal is being met by incorporating EFH consultation into the ESA Section 7 consultation, as represented by this biological evaluation.

[1] Pacific Fisheries Management Council (PFMC). 1999. Amendment 14 to the Pacific Coast salmon plan, Appendix A: Identification and description of Essential Fish Habitat, adverse impacts, and recommended conservation measures for salmon. Portland, OR.

[2] PFMC. 1998a. The Coastal Pelagic Species Fishery Management Plan: Amendment 8.

[3] PFMC. 1998b. Final Environmental Assessment/Regulatory Review for Amendment 11 to the Pacific Coast Groundfish Fishery Management Plan.

LOCATION

As stated above, the project site is located within and adjacent to Neah Bay on the southern shore of the Strait of Juan de Fuca. The site consists of the portion of Neah Bay adjacent to the west side of the existing Neah Bay Commercial Dock (existing dock) (Sheet 1) and the in-water mitigation/impact minimization sites. The impact minimization site is located near the northwest corner of Neah Bay as shown on Sheet 9.

The project site is within Water Resource Inventory Area 19, Lyre-Hoko Basin, and is located within Hydrologic Unit Code 17110021 (see Section 3 for a complete description of the project location).

DESCRIPTION OF PROJECT ACTIVITIES

The proposed action will construct an emergency spill response dock extension adjacent to the Makah Tribe's existing commercial fishing dock and fish processing facility located at the north end of Wispoo Street in Neah Bay, Washington, on the Tribe's land (Sheet 1). The proposed project represents the second phase of the Makah Dock Project that began with the emergency demolition and replacement of the Makah Commercial Fishing Dock in 2014 (Phase I). Phase II of the project involves construction of a dock extension to accommodate emergency response towing vessels (ERTVs) staged in the bay.

The ERTV and associated vessels staged in Neah Bay provide critical spill response capability within the bay and to nearby waters of the Strait of Juan de Fuca as incorporated into the Washington State Department of Ecology's Geographical Response Plan. Considering the pattern of vessel traffic in the area, in order to maintain adequate response capability going forward, improving deployment time and allowing for flexible equipment staging and vessel loading is necessary.

The proposed dock extension will provide a permanent mooring location for the vessels, allow for more rapid deployment, and allow greater functionality for vessel loading and unloading operations. The proposed dock extension will extend from the fishing dock trestle, approximately 80 feet south of the dock, approximately 563 feet to the northwest. Utilities, including electricity and fire extinguishing foam, will extend from the existing dock to provide service to the new dock and the emergency vessels moored there.

A maximum of approximately 208,000 cubic yards of material will be dredged from the project area to accommodate the draft of response vessels. The project will require dredging to increase the depth of the berth area to elevations ranging from -15 to -25 feet mean lower low water (MLLW). A transit channel extending to the north will also be dredged to a mudline elevation of -25 feet MLLW. The proposed dredge area is shown on Sheet 6. The proposed dredged material placement area is shown on Sheet 9.

POTENTIAL ADVERSE EFFECTS OF PROJECT ACTIVITIES

The proposed action has the potential to affect EFH for Pacific salmon, groundfish, and coastal pelagic species. Specific elements of the proposed action that could potentially impact EFH are summarized here (see Section 8 for a detailed analysis of the potential effects of the project).

Direct effects of the proposed action will be both temporary and permanent in nature. Temporary impacts will be limited to temporarily impaired water quality conditions and temporarily elevated noise levels within the action area.

The proposed dock extension will create approximately 34,730 square feet of new overwater shading associated with the size and configuration of the extension structure. The proposed extension will be located over subtidal habitat ranging from -2 to -25 feet MLLW. This has the potential to reduce overall aquatic habitat suitability by impacting benthic biotic communities and providing habitat for non-native or predatory fish species.

Pile installation activities could disturb sediments and temporarily increase turbidity within waterbodies that represent EFH for Pacific salmon. There is also slight potential for leaks and spills of fuel, hydraulic fluids, lubricants, and other chemicals from equipment and storage containers associated with the project. Discharge of vehicle and equipment wash water, etc., could also add pollutants to the soil that would then be delivered to waterways.

With any overwater work, there is also the potential for construction debris to enter the waterway. Several best management practices (BMPs) (described in Section 3.3) have been implemented to minimize the potential for debris to enter the waterway during construction.

The most significant potential noise-related effects will result from pile-installation activities. The proposed action will install up to 220 18- to 24-inch-diameter steel pipe piles. The project will also require the installation of approximately 20 temporary piles (also likely 18- and 24-inch-diameter steel pipe piles) for construction of a temporary work platform. Pile driving will be completed using a vibratory hammer to drive all of the piles to the extent practicable. If necessary, following vibratory driving to refusal (the point at which the pile will no longer advance with the vibratory hammer), the project will use an impact hammer to drive piles to their final tip elevations. As well, an impact hammer will be needed to proof the structural piles. A maximum of one out of four piles will be impact proofed. Pile-driving activities will be restricted to the approved in-water work window for Tidal Reference Area 10 (16 July to 15 February).

MINIMIZATION MEASURES AND BEST MANAGEMENT PRACTICES

Conservation/minimization measures and BMPs that will be implemented by the project are discussed in Section 3.2 above. The primary BMPs incorporated into the proposed action include implementation of a spill prevention control and countermeasures plan and the use of a bubble curtain to attenuate noise during impact pile driving.

The increased overwater coverage associated with the new structure will be mitigated to offset potential impacts to overall habitat quality.

Implementation of these minimization measures and BMPs will be sufficient to ensure that any impacts to EFH are temporary and insignificant, and do not affect any functional component of EFH for Pacific salmon, groundfish, or coastal pelagic species.

CONCLUSIONS

In accordance with the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act, it has been determined that the project "**will not adversely affect**" EFH for Pacific salmon, groundfish, or coastal pelagic species.

The proposed action has incorporated minimization and avoidance measures and BMPs intended to avoid and/or minimize potential effects to habitat. Water quality and noise impacts that may result during construction will be temporary and will result in no significant effects to any functional component of EFH for Pacific salmon, groundfish, or coastal pelagic species.