



Neah Bay Oil Spill Response Access Dock Construction

2022 RAISE Grant Application

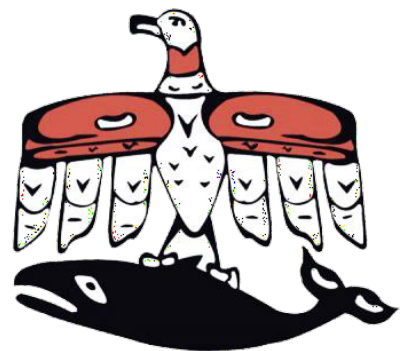
The Makah Tribe - Port of Neah Bay

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Project [website](https://www.moffatnichol.com/makah-tribe-2022-grant): [https:// https://www.moffatnichol.com/makah-tribe-2022-grant](https://www.moffatnichol.com/makah-tribe-2022-grant)





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ATTACHMENTS

- Application Benefit-Cost Analysis Report
- RAISE Grant BCA Tables April 2022
- Environmental Justice Analysis



I. Project Description

a) Project Overview

The Makah Tribe (Makah) is requesting a Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant of \$22,025,000 to construct a dock extension to the existing Makah Tribe Commercial Fishing Dock to improve mooring infrastructure and operational efficiency for homeporting Emergency Response Towing Vessels (ERTVs) and oil spill response vessels at the Port of Neah Bay (Figure 1), Washington (the Port). Relevant information and data sources for this application are provided in the attached documents and on the project [website](#).

The Makah 1855 Treaty of Neah Bay serves as the basis for the adjudication of the marine waters that make up the Makah Usual and Accustomed Treaty Area (U&A Area) adjacent to the Makah Reservation. The Makah Treaty Area extends westward into the Pacific Ocean approximately 40 miles west from the mouth of the Strait of Juan de Fuca (Strait), and eastward into the Strait almost to Port Angeles, Washington. This adjudication gives the Makah sovereign responsibility for protecting the treaty area, including the adjacent marine waters and shorelands that provide sustenance, well-being and quality of life for the Makah people.

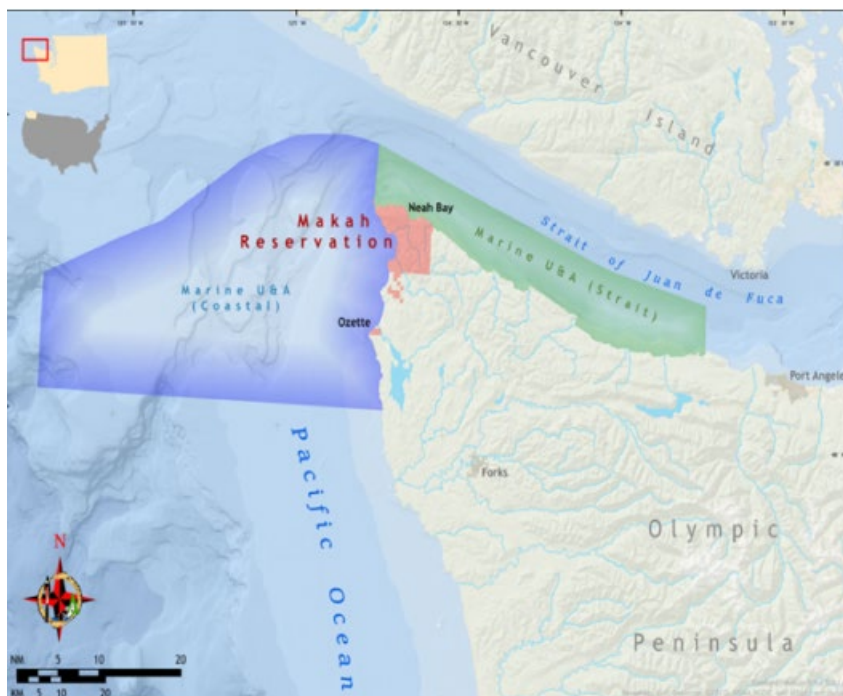


Figure 1. Project Location, Neah Bay, Washington

The Strait is a critical marine highway connecting Pacific international cargo to key ports in the US Pacific Northwest and Canadian British Columbia. The Port of Neah Bay is the closest marine vessel emergency response operation to the nexus with the Pacific Ocean at the western end of the Strait. The next closest facility is 55 nautical miles east at Port Angeles, with nearly 8 hours sailing time to reach the Pacific Ocean.



There are currently approximately 11,000 deep draft transits through the Strait of Juan de Fuca per year, including more than 1,000 oil tankers¹. Cargo volume through the Strait is expected to increase due to new oil export terminal under construction in British Columbia, increasing container vessel traffic, and increasingly complex supply chain issues. The increasing vessel traffic will increase the corresponding risk of marine accidents, oil spills and related significant local, regional, and international impacts to the environment, coastal communities, and marine shipping operations.

b) Transportation Challenges Addressed by the Project

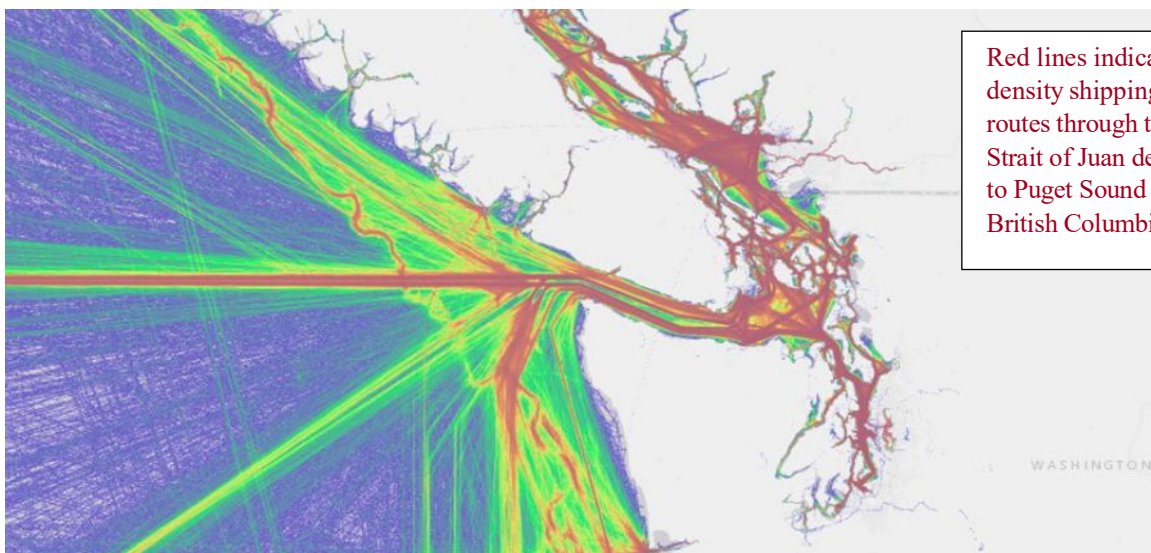
This project will optimize the efficiency of the rescue operations infrastructure in Neah Bay to address the transportation challenge of increasing risk of shipping accidents, oil spills, and the corresponding significant local, regional, and international impacts.

The Strait of Juan de Fuca is a strategic marine highway for connectivity of international cargo to Puget Sound and British Columbia ports (Figure 2). The cargo vessel traffic consists of bulk carriers, oils tankers, containerships, tug and barges, and vessels that collectively carry millions of gallons of petroleum fuel through the Strait each year.

Over the last few years, there has been an important global downward trend in oil spills from vessels. According to International Tanker Owner Pollution Federation (ITOPF) statistics, the annual number of seven-ton-plus spill events (222 gallons) has decreased by more than 90% since the 1970s. Recent history has shown slightly over six events occur per year². This reduction can be attributed to stricter safety regulations despite the growing volume of vessel traffic and the increase in crude and other tanker- traded products.

However, despite the use of new technology and procedures, spills still occur and continue to be a risk in areas with high vessel traffic. The largest spill in 2019 occurred in North America, resulting from a collision between two vessels³ in May 2019, when a 755-ft tanker collided with two barges pushed by a tug on the Houston Ship Channel, causing a spill of over 700 tons (>215,000 gallons).

Several major port terminal developments in the region have the potential to transform vessel traffic risks in the project area. The Washington State Department of Ecology and the United States Environmental Protection Agency funded a Vessel Traffic Risk Assessment (VTRA)⁴ in 2015 to examine risk in the Strait of Juan de Fuca and Puget Sound. The study showed that the possibility of a spill occurring increases as the number of vessels transiting this region increases.



Red lines indicate high density shipping vessel routes through the Strait of Juan de Fuca to Puget Sound and British Columbia

Figure 2. Map of Vessel Traffic Density in Strait of Juan de Fuca (Source: www.marinetraffic.com)

Apart from the organic growth in vessel cargo expected in the Puget Sound, new oil-transport infrastructure projects being developed in Vancouver, Canada (the expansion of the Trans Mountain Pipeline and creation of a second major petroleum terminal at Roberts Banks) will introduce an additional 348 oil tankers per year through the Strait, which represents a seven-fold increase in tanker traffic,⁵ and generates a fully laden outbound oil tanker transiting through the Strait of Juan de Fuca almost daily. The number of container ships currently on order is also growing and is another strong indicator of future increasing vessel traffic.

The VTRA model indicates the main proposed and underway projects will add a minimum of 1,600 deep draft vessels to the area⁶. Both the probability and the average size of oil spills are described in more detail in the project BCA (Section VI). As shown on Table 1, the probability of one accident occurring in 10 years after the anticipated development projects are completed increases over the probability during 2010, the year chosen as the base case.⁷

Table 1. Increasing Probability of Oil Spills After Anticipated Vessel Increases

Spill Volume (gallons)	Current Probability Estimate of at Least One Accident in 10 years in 2010	Future Probability of One Accident in 10 Years After Anticipated Development Projects
264 – 100,000	2.05	2.51
100,000 – 264,000	0.15	0.19

Washington State stationed ERTV has stationed response vessels permanently in Neah Bay since 1999 after recognizing the need for oil spill response and vessel rescue capabilities in the area. Five oil spill prevention and response vessels currently moor at the Port of Neah Bay Makah Marina, owned and operated by the Makah Tribe:

- Michele Foss (110 ft ERTV operated by Foss Maritime Company)



- Arctic Tern (80 ft oil skimmer operated by the Marine Spill Response Corporation [MSRC])
- Cape Flattery (110 ft spill response vessel operated by National Response Corporation [NRC])
- Two 20 ft MSRC and NRC Barges (support vessels)

The Neah Bay-based ERTV rescues (on average) one vessel every 1 to 3 months. The State Department of Ecology started tracking vessel incidences in March 1999, since that time through July 2020, there have been 80 incidents have required the deployment of a tug from Neah Bay, including five incidents in 2019 and four incidents in the first half of 2020. Twenty-one of the 80 deployments of the ERTV vessel resulted in a towing rescue⁸. The Washington Department of Ecology estimates that these actions have prevented millions of gallons of oil from spilling into Washington waters.



Figure 3. 2010 Rescue of 712-ft Container Ship

The project will allow for faster response, add additional moorage capacity, and provide a permanent moorage solution for the oil spill assets already located in Neah Bay. ERTV equipment stationed at Neah Bay can currently handle small or medium sized spills up to a maximum of 100,000 gallons. The existing dock is not constructed to support efficient or safe offloading or storing oil skimmed from a response event and the shallow draft conditions limit the response vessel's ability to leave the berth during (extreme) low tide events.



Moorage for the response vessels at the Marina limits their efficiency because the infrastructure is designed for much smaller, shallower draft fishing and recreational vessels (Figure 4). The project will enhance the existing response capabilities by building appropriate infrastructure to safely moor and reduce operational inefficiencies due to:



Figure 4. ERTV moored at the Makah Marina

- Insufficient water depth for the vessels at the marina during low tide conditions causing the ERTV to leave the berth and idle in the Bay During low tide conditions.
- Marina infrastructure that is not designed for mooring vessels of this length and tonnage suffers excessive wear and tear during mooring operations and storms.
- Access to the vessels is limited to foot traffic only for loading and unloading materials and equipment causing inefficiencies during emergency response activities

c) Project History

This project is the final step of long-term planning and significant investment in the marine infrastructure of Neah Bay by both the Makah Tribe and the US Department of Transportation.

Phase I (Replacement of the Commercial Fishing Dock) improved the mobility and operations of local and commercial fishing vessels at the Port of Neah Bay by replacing the existing deteriorated commercial fishing dock. The new fishing dock was designed to accommodate the (currently proposed) future extension (Phase II) of a dedicated response vessel access dock with features intended to enhance spill response infrastructure, including improved moorage conditions, providing access to the fishing dock cranes to assist in the deployment of oil spill equipment, and utilizing the fishing dock access trestle that can accommodate semi-truck traffic and other large vehicles needed to transport the response equipment and supplies to the response vessels.

The Makah Tribe provided \$10,000,000 for Phase I – Construction of the Commercial Fishing Dock (completed in 2014) without federal funding. Phase IIA consisted of planning, engineering, and permitting for the response vessel dock extension and was completed in 2018. That phase was funded via a 2014 TIGER planning grant (\$1,101,904) with a Makah Tribe matching contribution of \$88,523. Phase IIA also included environmental mitigation consisting of removing 3 sunken vessels from the project area that was funded by the Makah Tribe (\$150,000) and a \$150,000 matching grant from the federal National Oceanic and Atmospheric Administration (NOAA). The funding for the completed previous project phases is summarized in Table 2.



Table 2. Previously Completed Components Funding Summary

Completed Project Phase	Makah Tribe Funding	Federal Funding
Phase I (2013–2014): Construction of the New Commercial Fishing Dock	Makah Tribe: \$10,000,000	\$0
Phase IIA (2014–2018): Oil Spill Response Dock Pre- construction Activities (design and permitting)	Makah Tribe: \$88,523	USDOT 2014 TIGER Grant: \$1,101,904
Phase IIA (2018-2020) Mitigation Sunken Vessel Removal	Makah Tribe \$150,000	US NOAA Marine Debris Removal Grant: \$150,000

d) Project Design and Statement of Work

Detailed engineering drawings, construction estimates, and specifications can be found on the project [website](#). The project consists of constructing a dock with three finger piers using fixed pile-supported structures extending northwestward from the existing commercial fishing dock trestle (Figures 5 and 6). The extension will connect to the existing commercial fishing dock trestle approximately 40 feet south of the wharf platform and will extend 563 feet to the northwest. Two finger piers, approximately 325 and 340 feet in length, will extend to the north from the angled dock extension to create slips for the vessels. The extension and finger piers will have pre-cast concrete deck panels, along with gangways and fenders. The structure will have electrical, water, firewater, and stormwater collection/filtration systems



Figure 5. Design Rendering of Extension Facilities



The extension-based design utilizes the existing commercial fishing dock trestle, thereby eliminating the need for a second trestle and reducing the amount of new overwater construction and dredging needed for the project. Truck and equipment access for loading and unloading materials and supplies to the extension via the existing trestle.



Figure 6. Location of Extension to the Existing Makah Fishing Dock and Trestle

The new structure is specifically designed for mooring larger vessels than intended for the marina. Moving the response vessels to this infrastructure will alleviate ongoing wear and tear damage occurring at the marina's A-dock. The vacated space at A-dock will then be available for commercial fishing or recreational boats, providing an additional (\$283,800) to the marina's income.

Approximately 180,000 cubic yards of dredging will be required to achieve sufficient draft (-25 feet) to accommodate the response vessels during all tide conditions. This will greatly enhance the mobility of the response fleet compared to the current draft of the marina that is not deep enough for the vessels at very low tides, causing the ERTV to mobilize and remain stationed outside the entrance to Neah Bay to be able to respond immediately to an emergency call. The project design and mitigation will result in net benefits to aquatic habitat as follows:

Beach Restoration: 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.

Derelict Dock Removal: An existing unused dock located west of the project site burned in July 2017. Approximately 15 tons of burned piles, decking, and associated debris have been removed by the Makah Tribe, resulting in the removal of 3,840 square feet of overwater shading, and roughly 70 piles or 123 square feet of piling, to date. The remaining portions of the dock will be removed as mitigation for overwater coverage caused by the new extension. Washington DNR has committed to providing \$250,000 to the cost of this mitigation.

Debris Removal: Approximately 400 tons of debris were removed from the project area when the commercial fishing dock (Phase I) was constructed in 2014.



2020 Marine Debris Removal (Complete): Three derelict sunken vessels in the Makah Marina were removed through a National Oceanic and Atmospheric Administration (NOAA) Marine Debris grant of \$150,000. The Tribe contributed a 100% match to the grant for this activity. The vessels have an estimated combined benthic footprint of 2,355 square feet.

Future Additional Marine Debris Removal: The Makah Tribe has applied for and anticipates receiving another NOAA Marine Debris Removal Matching Grant of \$150,000 in late 2022. These funds will be matched by the Makah to remove additional remaining debris in the vicinity of the extension and the commercial dock, including metal, tires, fishing nets, piping, generators, and various other items. That debris will be removed during Phase IIB.

II. Project Location

The project is located in Neah Bay on the Makah Indian Reservation in Clallam County in Washington State (zip code: 98357) [Latitude 48°21'56"N/Longitude 124°36'25"W]. Neah Bay is not located within an Urbanized Area and is eligible for Rural grant funds. Neah Bay is a census- designated place that qualifies as an Area of Persistent Poverty and as a Historically Disadvantaged Area in accordance with the 2022 RAISE criteria.

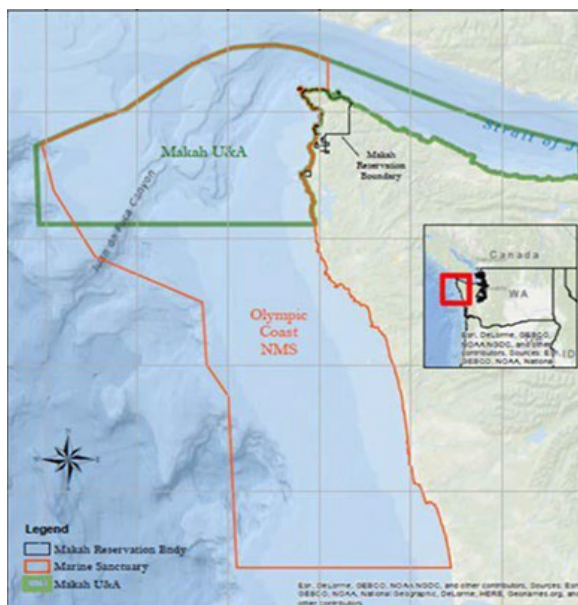


Figure 7. Reservation Lands and Usual and Accustomed Fishing Area (U&A) of the Makah Tribe, and National Marine Sanctuary

The Makah Reservation is remote with limited access via a long, twisting highway that is prone to mudslides. The only other access is by small boat or helicopter. Neah Bay is located over 60 miles from the closest town with services. In the event of an emergency, especially an oil spill, the community needs to be able to respond efficiently and effectively to protect the traditions, cultures, and economy of the Makah People. The project is co-located with the Makah Treaty Usual & Accustomed Fishing Area and the Olympic Coast National Marine Sanctuary (Figure 7), indicating its ecological value and importance. The coastal environments surrounding Neah Bay, the Straits and the northwest Pacific Ocean coast are vitally important to numerous fish, marine mammal, and bird species, including many endangered and/or threatened species and their habitat. Important habitats located in the project area are listed in Table 3.



Table 3. Habitat Areas Protected by the Project

Habitat Areas Protected by Oil Spill Response Project	
Habitat Type	Description
Bird Habitat	<ul style="list-style-type: none"> • The Pacific Flyway, an important north-south flyway for migratory birds in America, extending from Alaska to Patagonia • Habitat for over 100 marine bird species, some of which are listed as protected under the Migratory Bird Treaty Act • Critical habitat for birds listed under the Endangered Species Act (ESA), including the threatened marbled murrelet and endangered short-tailed albatross
Fish Habitat	<ul style="list-style-type: none"> • Habitat for over 200 species of fish • Habitat management for threatened or endangered species, including Chinook salmon, steelhead, and bull trout, Lake Ozette Sockeye • Migration and spawning grounds protection, 3 operating hatcheries
Habitat for Marine Mammal Species	<ul style="list-style-type: none"> • Harbor seals, river otters, sea otters, Steller sea lions, common minke whales, harbor porpoises, California grey whales • The highly endangered Southern Resident Killer Whales (SRKW) are slow to recover from oil spill impacts.⁹ The impacts of a spill to the fragile SRKW population would be catastrophic and devastating¹⁰ to SRKW recovery efforts.
Habitat for Other Species	<ul style="list-style-type: none"> • Over 1,500 invertebrate species • More than 500 marine plant species • Designated Critical Habitat for Endangered Populations including northern spotted owl, marbled murrelet, bull trout, Chinook salmon, streaked horned lark, and southern resident Orca
Protected Areas	<ul style="list-style-type: none"> • Olympic Coast National Marine Sanctuary (see Fig. 3) • Tribal hunting and fishing areas protected by treaties • Olympic National Park • Five national wildlife refuges

Three oil spills in the area (1972, 1988, and 1991) resulted in more than 3 million gallons of oil on the Makah Reservation, each spill devastating the Makah Tribe's natural resources.¹¹ The most recent spill (the 1991 Tenyo Maru) released an estimated 361,000 gallons of oil off the coast of Cape Flattery (approximately 4.5 miles northwest of Neah Bay).¹² According to the Final Restoration Plan and Environmental Assessment (April 2000), while the heaviest oiling occurred at the Makah Reservation and Olympic National Park, oil and environmental impacts occurred from Vancouver Island (British Columbia), along the entire Washington shoreline, to the northern beaches of Oregon.¹³



The Tenyo Maru spill damaged the aquatic habitat with toxic concentrations of oil and killed a minimum of 4,300 seabirds (at least 30 species of seabirds were impacted), including approximately 7 to 11 percent of the total outer coast population of the federally threatened marbled murrelet. An unknown number of marine mammals, including sea otters and harbor seals, were injured or killed as a result of the spill.

III. Grant Funds, Sources and Uses of Project Funds

The 2022 RAISE grant would fund construction to complete the final phase (Phase IIB) of a significant multi-phase project through construction of the new dock extension for the response vessels that was designed and permitted under Phase IIA [see Section Ib) and Ic)].

The Makah Tribe previously applied for a Better Utilizing Investments to Leverage Development (BUILD) grant for this project in 2018 and 2020, and for a RAISE Grant in 2021. This 2022 application is an updated and expanded version of those previous applications.

The Makah Tribe is requesting \$22,025,000 in 2022 RAISE funds to complete the final component of this long-term development and investment in the Neah Bay infrastructure - construction of the dock extension. The grant would be used for contract preparation, project management, and construction. The total Makah Tribe contribution for related earlier infrastructure improvements and planning from the Makah for Phase I and has been \$10,238,523, as shown above (Table 4). The federal funding to date has been \$1,101,904 (Phase IIA).

The Makah Tribe has limited sources of revenue as it does not receive funding from levies, sales, or property taxes. Therefore (as allowed by the RAISE grant matching requirements for rural areas), the Makah Tribe is not proposing matching funds for this Phase IIB, other than a \$250,000 contribution from the Washington State Department of Natural Resources for the mitigation action of removing the derelict dock (discussed in Section Id) and an anticipated \$150,000 NOAA grant for debris removal, as shown in Table 4. A more detailed budget summary is provided below in Table 4 and Table 5. Additional information is available on the project [website](#).

Table 4: Sources of Project Funding

Source	Status	Funding (\$)	Percent Contribution (%)
RAISE Discretionary Grant	Requested	\$22,025,000	98%
NOAA 2022 Marine Debris Removal Grant	Committed	\$150,000	1%
Federal		\$22,175,000	99%
Washington State Grant (Mitigation)	Committed	\$250,000	
Non-Federal		\$250,000	1%
Total		\$22,425,000	



Table 5. Budget Summary-Phase IIB Oil Spill Dock Extension

Budget Summary*	Use of Funds (2023 Dollars)	
Item Description	Cost (\$)	Contribution (%)
Project Administration/Management	\$1,477,000	7%
Dock Extension Construction	\$16,392,000	73%
Dredging (Site Work)	\$3,103,000	- 14%
Derelict Dock Demolition (Mitigation)	\$1,453,000	6%
Project Total Cost	\$22,425,000	100%

*The line items include a 30% contingency

IV. Merit Criteria

a) Safety

The response dock will increase the safety, capacity, and efficiency of the response team in Neah Bay to address increasing vessel traffic within a 100- mile area extending from the Pacific Ocean to the western portion of the Strait of Juan de Fuca and corresponding increasing risk of vessel accidents and potential oil spills (see Section I, Project Design and Statement of Work).

The assumption of increasing oil spills is based on increasing *total vessel traffic* because many oil spills are the result of emergency events on cargo vessels including container ships. For example, in October 2021, the container ship MV Zim Kingston had an explosion and fire 43 miles west of the Strait of Juan de Fuca during rough seas¹⁴. Over 100 containers were lost overboard, including 2 containers carry hazardous materials. The incident was controlled by ERTVs and the Canadian Coast Guard thus avoiding potential grounding or collision that could have caused an oil spill.

b) Environmental Sustainability

This project provides significant environmental sustainability benefits in that it reduces fuel consumption and greenhouse gas emissions associated with current standby activities, helps prevent adverse environmental impacts from hazardous materials releases that would threaten the health of numerous protected species, and addresses climate change.

Reducing Emissions

The project benefits include important contributions to reducing emissions related to response operations in that the response vessels currently need to leave the dock and idle in “pre-response standby mode” outside the bay due to the limited depth at the marina during extreme low tides. These vessels usually navigate out of the marina and idle for approximately 5 hours until the tide is high enough for them to return to the dock. These standby events cost approximately \$2,000 per event in crew time and fuel and can occur up to 60 times per year. The proposed project will allow the vessels to remain in port during low tides, contributing to significant local emissions reduction, lower operating costs, and reduced fuel use.



While the environmental impacts of an oil spill could vary depending on the specifics of a given incident, impacts from prior spills provide an understanding of the magnitude of potential impacts. The Tenyo Maru (see Section II, Project Location)) is a site-specific example of the significant negative impacts to numerous facets of the environment, including water quality, marine life, birds, terrestrial mammals, and others that could occur as a result of a spill in the project area.

By equipping Neah Bay with dedicated and adequate oil spill response infrastructure, the project also increases environmental sustainability by reducing the risk of a spill occurring and reducing the spread of a spill (should one occur). The risk of environmental impacts and other impacts, such as those seen during previous oil spills in the project area, will be greatly reduced through completion of the proposed project.

Climate Change

The project area is currently experiencing vertical land uplift. However, if the pace of sea level rise increases, the Reservation will face sea level rise impacts as soon as 2050 or 2100.¹⁵ The impacts of vertical land uplift are highly localized and important off-reservation sites are now at risk of sea level rise and erosion. Erosion already affects the Tribe's cultural resources (i.e., Lake Ozette Village Archaeological Site) economic resources, and public safety. In the event of an earthquake, any vertical uplift could be instantly reversed, making sea level rise an immediate threat. This project will be built with sea level rise and seasonal inundation in mind. It will also incorporate beach restoration activities to mitigate erosion impacts.

Tribal communities are on the frontlines of climate change impacts¹⁶ and the Makah Tribe is no exception. Recent community surveys indicate that 68% of the population is already seeing the impacts of climate change in their daily lives. Primary community concerns include impacts to fisheries, the ocean, and water resources. The Tribe has already conducted a climate change Impacts Assessment and is completing a Resilience Action Plan.

This project addresses the co- occurring threat of oil pollution on vulnerable resources and habitats, while providing important climate change mitigation and resilience benefits. The project will reduce vessel emissions, improve stormwater management, and mitigate erosion through beach restoration. We anticipate that, as global dependence on fossil fuels decreases, this infrastructure investment will remain strategic and useful both for the Tribe's fishing fleet as well as from a regional safety operations perspective. Some primary climate change impacts that the Makah Reservation area are or will experience are described below.

The frequency of heavy rainfall events has increased 12% in the Pacific Northwest since 1990,¹⁷ a trend anticipated to increase in frequency and intensity as a result of climate change.¹⁸ The Tribe has developed inundation maps that demonstrate how increases in seasonal precipitation and storm surge events put homes, tribal operations, roads, community buildings, subsistence food sources and critical infrastructure at risk. Increasingly intense winter storms are already



stressing the Tribe's energy infrastructure and frequently cause power outages, leaving seniors and other vulnerable populations without heat, power and/or reliant upon wood stoves. Sound and efficient coastal infrastructure that integrates stormwater considerations will be critical to local climate resilience.

Although the Makah Reservation receives high seasonal precipitation (approx. 100 inches/year), due to the unique geology in the region, there is limited groundwater storage capacity. The Tribe already experiences severe seasonal water shortages, which are exacerbated by climate change as we experience longer, drier, and hotter summers. These shortages limit the ability to relocate critical infrastructure, provide adequate housing for the community, and support economic development opportunities. This project would create jobs and provide revenue for the Makah Marina which could support water infrastructure improvements and efficiency measures. Table 6 summarizes how the project addresses climate change by reducing emissions and in enhancing and redeveloping existing infrastructure during construction and operations.

Table 6. Project Climate Change Benefits

Climate Change Element	Construction Activities	Operations
Emissions	<p>Potential construction emissions were reduced by utilizing the existing Commercial Fishing Dock trestle for an extension rather than build a larger structure at another location. The project required less materials and was completed in a shorter timeframe and therefore less impact to carbon dioxide (CO₂) and associated transportation emissions.</p> <p>Beach restoration will be completed using dredged material placed east of the marina using hydraulic pumping. This will eliminate the need for the dredged material to be transported by barge to the open-water disposal site located approximately 70 miles east.</p>	<p>Constructing deeper berths for the response vessels will allow improved readiness by eliminating the need for the ERTVs to leave the bay during extreme low tides.</p> <p>The dock extension will allow the vessel to remain in port during low tides, contributing to significant reduced fuel use and associated local emissions reduction and lower operating costs.</p> <p>The efficient construction design and near-site dredged material use will greatly reduce fuel use and associated emissions during construction.</p>
Increased Resiliency	<p>Beach restoration will help reduce damage from climate change induced increasing storm intensity.</p>	<p>Operational activities related to oil spill response increase resiliency by providing greater protection to human health and the environment, including critical habitats and endangered species.</p>

Environmental Justice

The project area is considered an area of high risk with respect to Environmental Justice as shown in Figure 8. An Environmental Justice Analysis was prepared for the Project and the surrounding Neah Bay area and determined that the construction of this project does not negatively or disproportionately impact the underserved, minority residents of the area.¹⁹ The implementation of the Project should improve water and air quality by addressing the response risks and the reduction of standby time of the vessels.

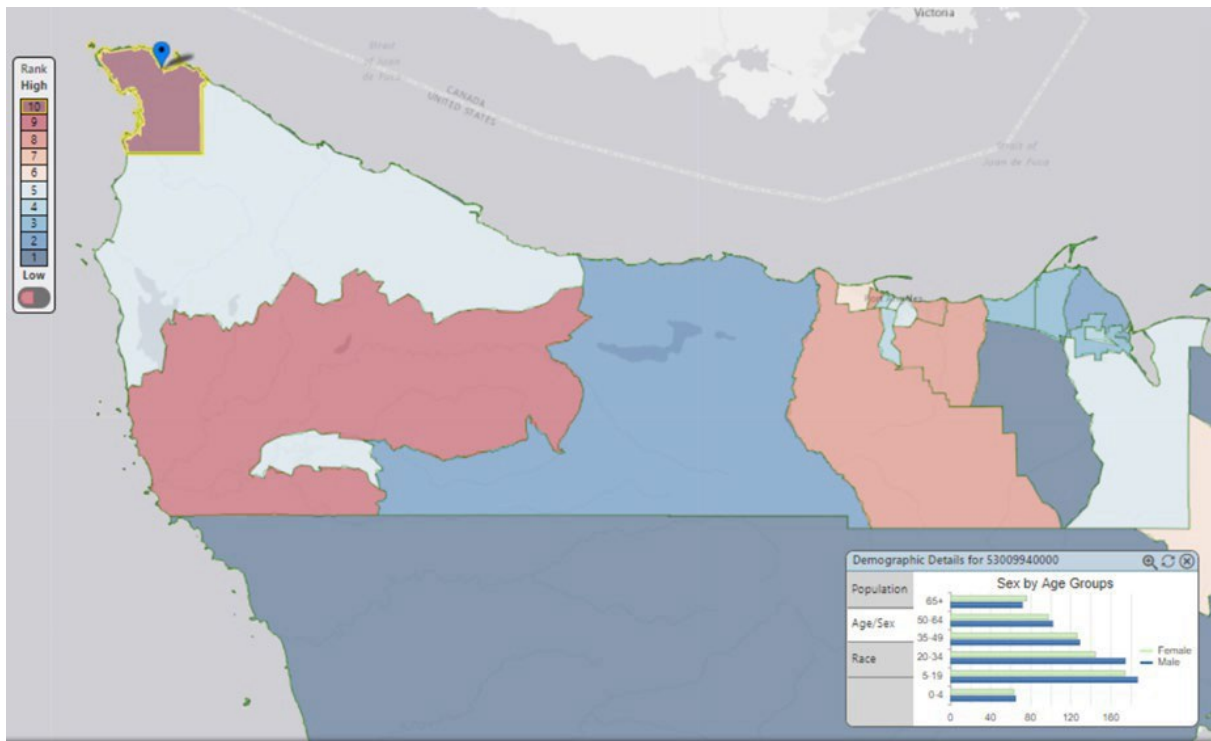


Figure 8. Environmental Justice Risk Ranking of Clallam County

c) Quality of Life

The Makah quality of life is enriched by a culture with long-standing reliance on the surrounding marine resources and an ocean fishing industry that drives the local economy. An oil spill could destroy the fish stocks and other life in the ocean that the Makah depend on for sustenance and commercial export as well as critical Tribal infrastructure.

Preventing and reducing the impacts of an oil spill is essential to the quality of life for the Neah Bay community. A spill would threaten the community's housing and infrastructure located along the shorelines and beaches at Neah Bay, the community's access to food sources, the local fishing economy, and the Tribe's traditional canoeing program. Completion of the project represents an insurance policy to protect the traditions, culture, and economic activity that comprise the Tribe's way of life.

Local harvest of resources is essential to the food security of the Makah people. Subsistence surveys conducted between 1997-1999 found that 99 percent of Makah households participated in subsistence activities annually with over 80 species used in the subsistence practices.²⁰ While seafood consumption is far below historic and preferred levels, the 1997-1999 surveys indicate that Makah annual per capita consumption of fish and shellfish was around 126 pounds and comprised nearly half of the total meat in the Makah peoples' diets. Currently, more than 50 percent of the local economy is supported by the Tribe's commercial fishing industry, which supports the financial and nutritional security of between 75-95 percent of the local population.²⁰

The Deepwater Horizon incident in the Gulf of Mexico has accounted for rehabilitation costs as high as \$38 billion and that total grows as other costs of restoration continue to be tallied. The impacts of an oil spill in the Strait of Juan de Fuca could similarly impact the regional economy.



As indicated in “Scoping Suggestions for the Risk of Accidents Associated with Vessel Traffic, “a major oil spill could cost the Washington economy \$10.8 billion and impact 165,000 jobs”²² These estimates are quoted from 2004 so their conversion to 2021 dollars results in a cost that is approximately \$15 billion. As stated by the Washington Department of Ecology, “an oil spill in this area would pose a substantial threat to Puget Sound’s environment, economy, and culture.”²³

The unit environmental cost of an oil spill as determined for the project BCA (see Section VI and attachments) was calculated based upon a report prepared for the US Department of Energy²⁴ that presented the spill unit cost for the Exxon Valdez and the S.S. Glacier Bay events in Alaska to be \$570 and \$390 per gallon respectively in 1993 dollars.²⁵ In order to use this value in the current BCA, the average cost per gallon of these two major events has been updated using the US GDP deflator of 1.77 which results in an average \$849 per gallon (based upon \$1.00 in 1993 equals \$1.77 in 2019 dollars) [Table 7].

Table 7. Example Oil Spill Cleanup Costs

Event Type	1993 USD Cost per Gallon	2019 Cost per Gallon (with Cost Deflator)
Exxon Valdez	\$570	\$1,008
Glacier Bay	\$390	\$690
Average tanker spill	\$480	\$849

It should be noted that the quality of life impacts resulting from climate change and oil spills to indigenous subsistence diets, practices, and culture are difficult to monetize. The impacts costs estimated above likely do not capture the full suite of values associated with food species and traditional food-related practices in Indigenous communities.²¹

The Makah Tribe is actively responding to climate change and potential Quality of Life issues. For example, the Makah Tribe was awarded a BIA grant in 2020 to support planning for a community food network to enhance community resiliency to environmental changes, including climate change and future oil spills. The grant provided funding for the Tribe to begin addressing the challenges to cultural and subsistence foods that community members utilize and consume, and how to better monetize the extent of the oil spill damages assessment under the Natural Resources Damaged Assessment (NRDA).²¹



d) Improving Mobility, and Community Connectivity

This project will increase protection of local, regional and international marine cargo as vessel traffic increases in the Strait of Juan de Fuca. The prevention of vessel incidences will enhance the safety and dependability of the supply chain by preventing accidents and damages that could impede the flow of vessels on this critical marine highway, and reduce the potential for significant environmental, economic and quality of life impacts, as described previously.

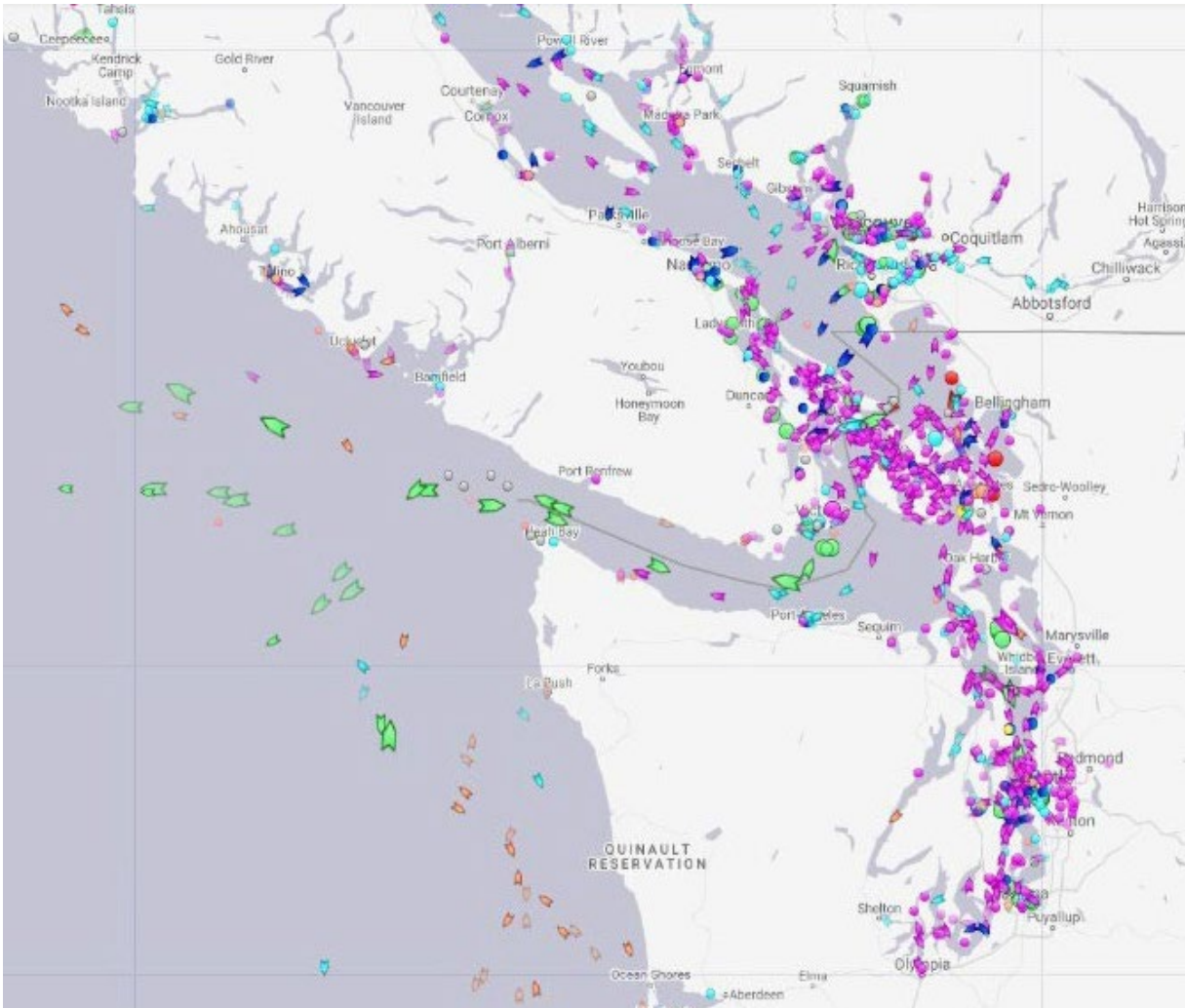


Figure 9. Live view of Vessel Traffic on 6/18/2021 12:37pm, Showing all vessels with AIS Trackers
(<https://www.marinetraffic.com/en/ais/home/>)



e) Economic Competitiveness and Opportunity

The project protects the regional economy of the Pacific Northwest, contributes to the preparedness safety net that supports new projects and the jobs they create, prevents costs associated with oil spills, and creates local jobs and economic opportunity in rural Neah Bay. All of these factors contribute to helping the US remain competitive in a global economy by facilitating the efficient, reliable, and safe movement of goods through maritime commerce - uninterrupted by costly and damaging oil spills.

Unemployment and poverty rates at the reservation continue to exceed those of the state or national averages. The Makah Tribal Council and its administration are working hard each year to improve these numbers and reverse this trend. This project will create at least 54 direct local jobs for tribal members during construction - a significant number in a community of 1550 people. Once complete, the response access dock will continue to improve access to local jobs through the increased availability of additional moorage for the Makah fishing fleet. That moorage will generate an additional \$283,000 in annual revenue for the marina.

This project protects the essential Strait of Juan de Fuca, a maritime trade route of national and international importance as discussed in Section I. Figure 9 demonstrates the scale of vessel traffic in this region. This trade route is essential for the U.S. to remain competitive in a global economy by facilitating the efficient, reliable, and safe movement of goods through maritime commerce - uninterrupted by costly and damaging oil spills.

Neah Bay provides critical prevention and response resources to vessels of all types transiting to major ports in the Pacific Northwest, which contribute significantly to the economy of the region. Examples of the economic importance of the region include:

- The Northwest Seaport Alliance (Ports of Seattle and Tacoma) provides over 58,400 direct jobs and contributes over \$12.4 billion in direct revenue to Washington State on an annual basis.²⁶
- The Port of Vancouver sustains 115,300 jobs and contributes over \$8.4 billion to the Canadian economy.²⁷
- Commercial and recreational fishing contribute an estimated \$4.9 billion (note - this study was conducted in 2006, this is closer to \$6.2 billion in 2021) to the Washington economy each year.²⁸
- The Makah Tribe's combined treaty fisheries alone generate approximately \$10 million a year for our treaty fishermen, their families, and the Makah community.

This project will create local jobs and economic opportunity for the rural community of Neah Bay. Re-allocating the dock capacity currently dedicated to the response vessels will decrease costs and increase access for the operation of the Tribe's commercial fleet. Representing over 50% of the local economy, the fishing industry health and productivity is essential for Neah Bay to remain economically competitive. The Makah Tribe uses local members for construction projects and requires projects to help fund its retraining and job placement programs. Multiple prospective employees have obtained the required hazardous waste operations and emergency response certifications to work in spill prevention and clean-up. These provisions are set forth and enforced under the Makah Employment and Contracting Rights Act (MECRA).



The MECRO office (part of the tribal organization) received more than \$84,000 in revenue for operations from the construction contract for Phase I. It is anticipated that similar revenue would be collected for construction of the response access dock.

Following the construction of the response access dock, additional revenue will be generated at the vacated mooring space at the Makah Marina. The marina forgoes \$1.00 per foot of each vessel per night as a result of having to refuse safe harbor to vessels that could use the slips that are occupied by the response vessels. Over the next 10 years, the Tribe estimates \$283,800 per year in additional revenue because of increased moorage at the marina.

f) State of Good Repair

This project is necessary to maintain the safety and good repair of the existing maritime infrastructure, ensure the continued safety of valuable federal, industry, and tribal response equipment, and maintain safe maritime transportation across in local, regional and transboundary waters. The Makah Tribal Council is committed to this project, as evidenced by its inclusion in the Tribe's strategic plan as a Tribal Council priority as well as significant previous investments (\$10 million plus) in the prior phases of construction and planning.

The Makah Tribe has passed a resolution to set aside 20% of the revenue generated from long-term leases at the marina for ongoing maintenance and repair to maintain the response access dock in a state of good repair following construction. With a 20 percent set aside for operation and maintenance expenses, the Tribe would generate about \$1.7 million over the next 30 years for transportation-related activities, including dock maintenance and repair.

g) Partnership and Collaboration

This project represents the final step of many years of work, planning, and significant investments from the Tribe (over \$10 million) and the federal government through a TIGER Grant awarded in 2014 (\$1.1 million). This project is the result of innovative relationship building among the Makah Tribe, the shipping industry, Oil Spill Response Contractors, the US Coast Guard, and other federal and state agencies. It has multi-faceted support from state agencies, federal agencies, Tribes, elected representatives, and the maritime sector.

Over 3 million gallons of oil have spilled within the Makah Usual & Accustomed Fishing Area since the 1970s. Previous oil spills in the Neah Bay area and elsewhere demonstrate that even though the probability of an oil spill is small, the potential consequences to precious treaty resources are very high. These experiences have required that the Makah Tribe become deeply engaged in the oil spill prevention, preparedness, and response community of the Pacific Northwest. The Tribe has a memorandum of agreement (MOA) with the United States Coast Guard (USCG) District 13 which formalizes the implementation of our ongoing government-to-government work (the MOA is provided on the project [website](#)).

The Makah Tribe was also the first Tribe to become a voting member of the Region 10 Regional Response Team (RRT) and we participate actively in the RRT and the Northwest Area Committee. We are also the only Tribe who is a voting member in the Puget Sound Harbor Safety Committee, an industry vessel traffic forum, and have several partnerships with Canadian government and industry entities. This project is informed with the input of these partners.



The project also includes innovative partnerships and requires significant cooperation between project parties, including the U.S. and Canadian governments, private industry, non-profits, and environmental groups. An oil spill would threaten both U.S. and Canadian resources and the Tribe has proactively worked with multiple layers of government to develop a solution to oil spill response. The Tribe was successful in bringing the project to the attention of Washington Governor Jay Inslee who met with Canadian Prime Minister Justin Trudeau and discussed the response access dock. Talking points from that discussion are included on the project [website](#). Other recent partnerships include:

- The Makah Tribe is the Non-federal sponsor for the U.S. Army Corps of Engineers (USACE) Section 107 Deepening of the Neah Bay Entrance Channel Project (Figure 10) – a project that further improves response vessel readiness and accessibility as well as accommodating entrance to Neah Bay by other larger vessels by deepening the channel entrance to the bay. The Makah tribe has participated in a project Partnership Agreement (PPA) with the USACE to complete a feasibility study and environmental assessment for dredging to deepen the channel. This project is authorized under the Continuing Authorities Program (CAP), Section 107 of the River and Harbor Act of 1960; 33 USC 577, as amended, which provides authority for USACE to partner with non-federal sponsors to construct small river and harbor improvement projects: “that will result in substantial benefits to navigation and which can be operated consistently with appropriate and economic use of the waters of the Nation for other purposes...”. The project feasibility, design and environmental reviews are complete and the dredging is expected to occur in late 2022. The Makah Tribe has contributed \$88,523 to the project feasibility study and environmental assessment.



Figure 10. USACE/Makah Tribe Channel Deepening Project



- The Washington DNR is committed to improving aquatic habitat by removing derelict piles, structures and sunken vessels and is contributing \$250,000 to the cost of the project's mitigation action to remove a derelict timber structure. (See discussion regarding mitigation in the Project Design and Statement of Work - Section I).
- In 2018 NOAA matched \$150,000 to \$150,000 Makah funding to remove sunken vessels from the Marina area in 2018, and the Makah anticipate a second matching \$150,000 Marine Debris Removal grant to be funded in 2022. These activities are also mitigation for the Phase IIb construction.
- In 2020, the Makah Tribe was awarded a Bureau of Indian Affairs (BIA) grant to support planning for a community food network to enhance community resiliency to environmental changes, including climate change and future oil spills. The grant provided funding for the Tribe to begin addressing these challenges to cultural and subsistence foods in the community and how to better monetize the extent of the oil spill damages assessment under the Natural Resources Damaged Assessment (NRDA) process.

h) Innovation

The project utilized a forward-thinking, innovative design approach that leverages the truck and equipment access provided by the Commercial Fishing Dock trestle to improve the loading operations of the response vessels; greatly reducing the area of aquatic habitat impact by not creating a separate trestle at another location on the shoreline. The project components will be pre-cast and prefabricated to allow efficient construction and reduce exposure and weather risks, along with minimizing environmental impacts of construction and future response vessel operations.

Specific examples of project design and innovation include:

- The project site was chosen because building an extension from the trestle of the existing commercial fishing dock eliminates the need for a new shoreline connection and minimizes the amount of new overwater construction and shading. The proposed design also allows the extension to be constructed in deeper water, and thereby minimizes the amount of dredging necessary to accommodate vessel berthing and transit. The new structure will therefore not impact any intertidal habitat.
- 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 dock extension. This reduces the risk that concrete could be spilled into the water during construction, and expedites on-site construction, like the exceptionally fast construction of the fishing dock in 2014.
- The new structure is designed to capture and treat all stormwater prior to discharge to protect water quality in the project area.
- The design includes using vibratory pile installation methods to for about 90% of the pile driving activities to reduce the amount of underwater noise (potentially harmful to marine mammals and birds) generated during pile installation. Impact driving will only be used to conduct pile "proofing" to confirm that the design loading capacity is achieved. This method of pile driving, and limited proofing will also add to the efficiency and speed of construction.



V. Project Readiness and Environmental Risk

Environmental studies were conducted to identify and detail project impacts and proposed avoidance, minimization, and mitigation measures incorporated in the project design in order to obtain regulatory permits and/or approvals. These studies include engineering design, biological evaluation (BE), cultural resources review, dredged material characterization, review for construction impacts such as noise, water quality, and potential spills of hazardous materials. Plans for controlling and monitoring water quality, noise impacts to marine mammals have been submitted for approval along with the permit applications. These documents are available on the project [website](#).



Figure 11. Makah Commercial Dock Trestle Construction 2014

a) Project Schedule

As is demonstrated in the Schedule below (Table 8), this Project can be easily obligated before the statutory deadline of September 30, 2026, with the goal of construction completion by Q4 2024, and close out in Q1 2025.

Table 8. Project Schedule

Project Phase	2022				2023				2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Notice of RAISE Award																
DOT (MARAD) NEPA																
Obligation of RAISE funds																
Final Plans & Construction Bidding																
Construction																
Contract Close Out																



b) Regulatory Approvals

i. Information on NEPA Status of the Project

National Environmental Policy Act (NEPA) was completed by the USACE as part of their permitting of the project under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The NEPA analysis resulted in a Finding of No Significant Impact ([website](#)). Washington State Environmental Policy Act (SEPA) has also been completed by the Washington Departments of Ecology and Natural Resources. These studies will be used to support NEPA evaluation by the United States Maritime Administration (MARAD). Discussions with MARAD regarding NEPA needs were initiated in June 2021 as described in section [iv](#). (below).

ii. Other agencies

Coordination with other federal, state and local agencies has occurred throughout the project design and permitting, as indicated in Table 9. USACE Section 7 Consultation re Endangered Species Act impacts with Nation Marine Fisheries Services (NMFS) and the United States Fish and Wildlife Service (USFWS) was completed as required and USFWS conferred with the “no effect” determination by the USACE. The NMFS issues a Biological Opinion on 5 October 2018 and imposed several conditions on the work, as described in the USACE Section 10/404 permit ([website](#)).

iii. Documents and Studies

Environmental studies were conducted to identify and detail project impacts and proposed avoidance, minimization and mitigation measures incorporated in the project design in order to obtain the permits and/or approvals shown in Table 9. These studies are available on the project [website](#). Key site-specific environmental studies completed to achieve the federal, state and local permits and approvals include:

- Biological assessment to evaluate potential construction and operational impacts to fish, marine mammals, and birds, including endangered species and critical habitats.
- Sediment quality assessment was conducted to identify suitability of material dredged to deepen the moorage area for beneficial use to restore historic beach area near the project site.
- USACE conducted NEPA alternatives analysis and environmental assessment related to the project and future operations as part of the federal Clean Water Act Sections 404 and 401 regulatory review and permitting. The minor impacts identified with the project generally consist of dredging and shading of deep-water habitat due to the new overwater dock structures and loss of benthic substrate due to the placement of piles to support the structures. These impacts were avoided, minimized, and mitigated via the engineering design as described in the Project Design and Statement of Work section presented in Section I. The USACE environmental assessment resulted in a Finding of No Significant Impact (FONSI).
- Section 106 Cultural Resources impacts were evaluated by the Makah Cultural and Research Center and conclude the project would have no effects on cultural resources.



iv. MARAD NEPA Discussions

MARAD NEPA will need to be completed prior to construction. The Makah anticipate that the studies completed to date and the minimization and mitigation of project impacts via thoughtful project design will serve to streamline the MARAD NEPA process.

The project permitting details were discussed with the MARAD NEPA specialist Kristine Gilson on June 24, 2021. Ms. Gilson advised that the NEPA, Section 7 and Section 106 consultations will likely be applicable to MARAD NEPA evaluation, and that additional regulatory analysis may not be required by the Makah Tribe, assuming there are no significant changes to the regulations or project components prior to construction.

v. Right of Way

The project will not require acquisition of right-of-way. The project area is located within aquatic area managed by the Washington DNR, as is the Makah Fishing Dock. The Fishing Dock DNR lease will be modified to include the new extension area. Coordination with DNR has occurred throughout the planning and permitting processes and will be completed when the construction is finished.

vi. Public Engagement

There have been numerous activities by the Makah Tribe and the regulatory agencies with respect to public engagement, including community engagement workshops in Neah Bay, public notices as various permits and reviews were completed, consultations with the USCG, MSRC, NRC, the Washington Pilots Association, Trans Mountain Pipeline Expansion Project, and the Canadian government. A detailed list of these activities and related documents are provided on the project [website](#).

c) State and Local Approvals

Federal, state, and local permitting requirements for the Phase IIB project were identified and initiated during the planning portion of the project (Phase IIA, funded through the 2014 TIGER Grant), and all required permit applications and environmental studies have been prepared and are approved. Required permits, reviews and/or approvals and the corresponding responsible agencies are identified below. In addition to the information presented below, the Tribal Transportation and Land Use Planner, Michelle Smith, has coordinated with Washington State Department of Transportation (WSDOT) and the Washington State Peninsula Regional Transportation Planning Organization to include the response access dock on the Statewide Transportation Improvement Program.



Table 9. Regulatory Approval Status Summary

Regulatory Authority	Reviews/Approvals/Consultations	Status
Makah Tribe of Indians	Makah Tribe State Historic Preservation Act/ Section 106 Review	Completed
	Section 401 Water Quality Certification	Completed
	Coastal Zone Management Concurrence	Completed
U.S. Army Corps of Engineers	National Environmental Policy Act (NEPA) Review - Finding of No Significant Impacts (FONSI)	Completed
	Rivers and Harbors Act Section 10 Individual Permit	Completed
	Clean Water Act Section 404 Permit for Placement of Fill or Dredged Material into Waters of the U.S.	Completed
	Dredged Material Management Program Suitability Determination	Completed
U.S. Department of Fish and Wildlife (USDFW), National Marine Fisheries Service (NMFS)	Endangered Species Act Concurrence (USDFW/NMFS)	Completed
	Marine Mammal Protection Act Concurrence (NMFS)	Completed
Washington Department of Fish and Wildlife	Hydraulic Project Approval (WDFW)	Completed
Washington State Department of Ecology (WDOE)	Washington State Environmental Policy Act (SEPA) Review- Determination of Non-Significance (DNS)	Completed
	Section 401 Water Quality Certification	Completed
	Coastal Zone Management Concurrence	Completed
Washington State Department of Natural Resources (WDNR)	Aquatic Use Authorization	Issued prior to construction
	Aquatic Lands Right of Entry – to be issued prior to construction	Issued prior to construction
	Expanded Aquatic Land Lease – to be issued prior to construction	Issued prior to construction

1. Federal Transportation Requirements Affecting State and Local Planning

See Item Vc)- State and Local Approvals

c. Assessment of Project Risks and Mitigation Strategies

This project is relatively straightforward and low risk with respect to feasibility, schedule and cost. The Tribe has already committed over \$10 million to the project and our commitment to this project remains strong. There are no real estate transactions required to complete this project because all of the land and resources are tribally owned. Particularly given the impacts of COVID-19 on local unemployment rates, we do not anticipate challenges with labor availability locally. The greatest risks are related to environmental weather delays and the availability and increasing cost of construction materials as described below. Other typical potential risks and proposed mitigation strategies are summarized in Table 10.



- **Environmental and Weather Delays:** The Port of Neah Bay’s location means that sometimes access can be challenging, due to mudslides, downed trees, and road work. Weather can be extreme and winter storms frequently cause power outages that may last for several days. However, due to the shovel-ready nature of the project and the anticipated schedule, we expect that even if the project is delayed due to weather issues, it should still be completed within one additional year of the projected timeline of 4th quarter 2024.
- **Availability of contractors and construction materials:** There is an unknown risk of the potential impacts of the COVID-19 pandemic on the availability of contractors, non-local labor, materials, and the associated costs. The project cost estimates provided in this application assume pre COVID-19 conditions. Contingency has been added to the construction costs due to the increasing cost of steel due to COVID-19 virus, and current supply-chain issues.

Table 10: Risk Mitigation Matrix

Potential Risk Area	Risk Type	Current Status/ Proposed Mitigation	Risk Level
Technical Feasibility	Feasibility	Preliminary design developed to 90%	Low
Design Standards Conformance	Feasibility	Preliminary design developed to meet USACE standards	Low
Partner Approvals	Schedule	Preliminary design developed with input from all partners.	Low
Local Jurisdiction Approvals	Schedule	Past history of multi-agency cooperation and collaboration is anticipated to continue.	Low
Environmental Approvals	Cost, schedule	Environmental documentation is complete	N/A
Permitting	Schedule	Federal, state and local permits have been issued as detailed in Section ii above. MARAD NEPA discussion have been initiated as discussed in Section iv above and would be completed following award of the grant. Several minor permits related to dredging will also be required and will be obtained prior to construction. The schedule allocates time to complete the remaining project permitting requirements.	Low
Public Engagement	Cost, schedule	Extensive public involvement effort was done as part of the Tribe’s planning and budgeting processes.	Low



VI. Benefit Cost Analysis

The merits of this Project align with the RAISE FY22 Selection Criteria: Safety, Environmental Sustainability, Quality of Life, Improving Connectivity and Mobility, Economic Competitiveness, and State of Good Repair, Partnership and Collaboration, and Innovation as is supported by the Benefit Cost Analysis and the following discussion. The BCA of 1.94:1 demonstrates that the project is cost-effective and justifies public investment.

Key results from the BCA are summarized in Table 11 (see Appendix A-1: BCA Narrative for detailed analysis). Benefits of the Project over the 20 years post construction (discounted) include:

- Improving Safety (and Environmental Sustainability) by reducing oil spills over the next 20 years by 50,000 gallons equaling a savings to society of \$31.0 mill
- Reduction of 42,000 standby vessel hours will save over \$0.9 million in operating costs to shippers and other vehicle users.
- Savings of 450,000 gallons of fuel usage by eliminating vessel standby will reduce pollutants estimated to save 4,600 MT of CO₂ and other emissions valued at \$0.2 million.
- Adding a new Skimmer Vessel to the fleet will increase shipper costs by \$3.4 million that will be offset by the improved response time and reduction of oil spilled.
- Total Societal Benefits exceed \$30.3 million (discounted over the 20-year analysis period).
- Total Capital Costs are \$15.8 million at a 7 percent discount rate.
- Net Present Value is estimated to be \$14.5 million for the analysis period.



Table 11.BCA Analysis Summary

Areas of Evaluation	Description	Inputs (over the life of the project)	Monetized Value (2020 dollars)	Total Discounted Value
Safety / Environmental Sustainability	Reduction in Oil Spills		\$ 90,477,487	\$31,336,687
Environmental Sustainability	Reduced Emissions from reduced fuel usage / Standby time	Emission reductions: 4,600 MT CO ₂ 0.13 MT NO _x	\$ 357,600	\$ 213,712
Economic Competitiveness	Reduction in Standby Cost (before emissions)	42,000 hours of Standby eliminated	\$ 2,570,486	\$ 970,794
	New Vessel Operation Cost Savings	Operating and maintenance of a new skimmer vessels has been included in the analysis	\$(9,000,000)	\$(3,399,024)
State of Good Repair		Not calculated other than in Life cycle		
Total Benefits before Maintenance and Residual Value			\$84,405,573	\$ 29,122,169
Maintenance and Residual		Life Cycle Cost and Residual	\$ 9,599,527	\$ 1,519,879
Total Benefits			\$94,005,100	\$ 30,642,048
Total Costs			\$(21,179,210)	\$(15,808,697)
Net Present Value			\$ 72,825,890	\$ 14,833,351
Benefit Cost Ratio				1.94

NOTES AND REFERENCES

1. WA Department of Ecology. VEATs Report, 2019. Retrieved May 2020. <https://fortress.wa.gov/ecy/publications/documents/2008004.pdf>
2. International Tanker Owner Pollution Federation (ITOPF). 2020.
3. ITOPF 2020, *ibid*.
4. Van Dorp, J.R., Merrick, J. (2015) Final Report: Vessel Traffic Risk Assessment 2015. Prepared for the Washington State Department of Ecology. Retrieved May, 2020. <https://fortress.wa.gov/ecy/publications/documents/1708009.pdf>Cash-rich shipowners double container ship order book in 2021 (bimco.org)
5. Trans-Mountain, Kinder-Morgan, Trans-Mountain Expansion Project, August 2017; available at https://www.portvancouver.com/wp-content/uploads/2017/06/Appendix-G3_Consideration-Report-WMT_FINAL.pdf (No longer available on web).
6. Van Dorp & Merrick, *ibid*.
7. Van Dorp & Merrick, *ibid*.
8. Washington State Department of Ecology, Spills Maps – Neah Bay Emergency Response Towing Vessel Call Outs. Retrieved May, 2020. https://fortress.wa.gov/ecy/coastalatlases/storymaps/spills/spills_sm.html?&Tab=nt2
9. NOAA Office of Response and Restoration. (2012). More than Two Decades Later, Have Killer Whales Recovered?. Retrieved May, 2020. <https://response.restoration.noaa.gov/oil-and-chemical-spills/significant-incidents/exxon-valdez-oil-spill/more-two-decades-later-have-kill>
10. Lacy, R.C., Williams, R., Ashe, E. et al. Evaluating anthropogenic threats to endangered killer whales to inform effective recovery plans. *Sci Rep* 7, 14119 (2017). <https://doi.org/10.1038/s41598-017-14471-0>
11. NWIFC News, “Makah Defends Coast Against Oil Spills,” Winter 2010; available at <https://www.yumpu.com/en/document/view/20079573/winter-2010-nwifc-magazine-northwest-indian-fisheries-5>
12. NOAA Incident News. F/V Tenyo Maru. Retrieved May, 2020. <https://incidentnews.noaa.gov/incident/5017>.
13. U.S. Department of the Interior Restoration Program, F/V Tenyo Maru Fuel Oil, Diesel and Lube Oil Spill, 2017; available at https://www.cerc.usgs.gov/orda_docs/CaseDetails?ID=908
14. Captain. 2021. “ZIM Kingston Cargo Fire Stabilized and Ship Held Overnight, Canadian Coast Guard Says”. 25 October 2021. <https://gcaptain.com/zim-kingston-cargo-fire-stabilized-canadian-coast-guard/>
15. Petersen, S., et al. (2015). Climate Change Preparedness Plan for the North Olympic Peninsula. Available: www.noprcd.org
16. Jantarasami, L.C., R. Novak, R. Delgado, E. Marino, S. McNeeley, C. Narducci, J. Raymond-Yakoubian, L. Singletary, and K. Powys Whyte, 2018: Tribes and Indigenous Peoples. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S.

Global Change Research Program, Washington, DC, USA, pp. 572–603. doi: 10.7930/NCA4.2018.CH15

17. Adelsman, H., Ekrem, J. (2012). Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy. Washington State Department of Ecology. Olympia, WA.
18. Warner, M.D. et al. (2015). Changes in Winter Atmospheric Rivers along the North American West Coast in CMIP5 Climate Models. *J. Hydrometeor*, 16, 118–128.
19. Makah Tribe of Indians. 2021. Racial Equity Impact Analysis, Equity focused Community Outreach and Public Engagement
20. Sepez, J. (2001). Political and Social Ecology of Contemporary Makah Subsistence Hunting, Fishing, and Shellfishing Practices. Doctoral Dissertation. Retrieved from University of Washington Library.
21. Makah Tribe of Indians 2020. A Methodology to Integrate Cultural Resources and Values into Tribal Natural Resource Damage Assessments, White paper to the Makah Tribe's Office of Marine Affairs
22. Alexander Gillespie, Scoping Suggestions for the Risk of Accidents Associated with Vessel Traffic, January 15, 2013; <http://www.sanjuans.org/documents/EISReport-VesselTraffic.pdf> (not currently available)
23. WA Department of Ecology. Oil Spill Prevention in Washington. Retrieved May, 2020. <https://ecology.wa.gov/Spills-Cleanup/Spills/Oil-spill-prevention>
24. Advanced Resources International. 1993. Economic Impacts of Oil Spills: Spill Unit Costs for Tankers, Pipelines, Refineries, and Offshore Facilities. U.S. Department of Energy Office of Domestic and International Energy Policy
25. Northwest Seaport Alliance. Economic Impact Summary. Retrieved May, 2020. <https://www.nwseaportalliance.com/stats-stories/economic-impact>
26. Port of Vancouver. About Us. Retrieved May, 2020. <https://www.portvancouver.com/about-us/>
27. Washington Department of Fish and Wildlife. (2006). Fish and Wildlife Generate Billions for Washington State. Retrieved May, 2020. <https://wdfw.wa.gov/sites/default/files/publications/00570/wdfw00570.pdf>

ABBREVIATIONS LIST

ATB	Articulated Tug Barges
BCA	Benefit Cost Analysis
BE	Biological Evaluation
BUILD	Better Utilizing Investments to Leverage Development
CAP	Continuing Authorities Program
CO2	Carbon Dioxide
COVID-19	2019 Novel Coronavirus
DMMP	Dredged Material Management Plan
DNS	Determination of Non-Significance
DOT	United States Department of Transportation
ERTV	Emergency Response Towing Vessel
ESA	Endangered Species Act
FONSI	Finding of No Significant Impacts
FY	Fiscal Year
Makah	Makah Tribe
MARAD	United States Maritime Administration
marina	Port of Neah Bay Marina
MOA	Memorandum of Agreement
MECRA	Makah Employment and Contracting Rights Act
MECRO	Makah Employment and Contracting Office
MSRC	Marine Spill Response Corporation
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOx	Nitrous Oxide
NRC	National Response Corporation
NRDA	Natural Resource Damage Assessment
NOAA	National Oceanic and Atmospheric Administration
PPA	Project Partnership Agreement
RAISE	Rebuilding American Infrastructure with Sustainability and Equity
RRT	Region 10 Regional Response Team
SEPA	Washington State Environmental Protection Act
SPCC	Spill Prevention Control and Countermeasures Plan
SRKW	Southern Resident Killer Whales
Strait	Strait of Juan de Fuca
TIGER	Transportation Investment Generating Economic Recovery
U&A	Usual and Accustomed fishing area
U.S.	United States
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDFW	United States Department of Fish and Wildlife
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
WDFW	Washington State Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WDOE	Washington State Department of Ecology
WSDOT	Washington State Department of Transportation