DRAFT

ENVIRONMENTAL IMPACT STATEMENT

for

BREMERTON WATERFRONT INFRASTRUCTURE IMPROVEMENTS

at

PUGET SOUND NAVAL SHIPYARD AND INTERMEDIATE MAINTENANCE FACILITY, NAVAL BASE KITSAP-BREMERTON

VOLUME 1: CHAPTERS 1-6

July 2025

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Abstract

Designation:	Environmental Impact Statement
Title of Proposed Action:	Bremerton Waterfront Infrastructure Improvements
Project Location:	Naval Base Kitsap-Bremerton, Bremerton, Washington and Naval Base Kitsap-Bangor, Silverdale, Washington
Lead Agency for the EIS:	United States Department of the Navy
Cooperating Agencies:	United States Army Corps of Engineers, Seattle District
	United States Environmental Protection Agency, Region 10
Affected Region:	City of Bremerton and Kitsap County, Washington
Lead Action Proponent:	Naval Base Kitsap
Co-action Proponents:	Program Management Office 555, Shipyard Infrastructure Optimization Program
	Naval Sea Systems Command (NAVSEA) Puget Sound Naval Shipyard and Intermediate Maintenance Facility
Point of Contact:	Bremerton EIS Project Manager Naval Facilities Engineering Systems Command Northwest 1101 Tautog Circle, Room 210 Silverdale, Washington 98315 info@BremertonWaterfrontImprovementsEIS.com
Date:	July 2025

The United States (U.S.) Department of the Navy (Navy) prepared this Draft Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA). The U.S. Army Corps of Engineers, Seattle District, and the Environmental Protection Agency, Region 10, served as cooperating agencies on development of the document. The Navy also worked closely with the Suquamish Indian Tribe of the Port Madison Reservation (Suquamish Tribe), Skokomish Indian Tribe (Skokomish Tribe), Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Tribal Community (Lower Elwha Klallam Tribe) to develop this EIS. The Navy proposes to construct and operate a new multi-mission dry dock at Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF). The Proposed Action includes dredging to create adequate water depth at wharves and piers, and as required for construction of new structures. Some existing shipyard functions affected by construction at PSNS & IMF would be moved to Naval Base Kitsap-Bangor. The Navy needs the Proposed Action to address critical deficiencies in dry dock capability, capacity, and seismic survivability at Naval Base Kitsap-Bremerton to enable PSNS & IMF to meet its mission to support the Navy's nuclear fleet. The Notice of Intent discussed several projects that are no longer part of this Proposed Action. Three potential future actions - Pier 5 demolition, Pier 6 replacement, and Dry Dock (DD) 6 seismic upgrades - are not currently funded or programmed for implementation, and a future construction schedule has not been determined. If the Navy decides to proceed with these potential projects at a later date, the Navy will analyze potential environmental impacts in accordance with NEPA requirements and Navy implementation policies. This EIS evaluates the potential environmental impacts associated with two action alternatives and the no-action alternative to the following resource areas: air quality, water resources, geological resources, biological resources, cultural resources, American Indian traditional resources, land use and recreation, visual resources, noise, utilities and infrastructure, transportation, marine navigation, public health and safety, hazardous materials and wastes, and socioeconomics.

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Readers Guide

How to Use this Document

The United States (U.S.) Department of the Navy's (Navy) goal is to provide a document that presents a thorough, accurate analysis of the current environment, the Proposed Action, and the potential environmental impacts of reasonable alternatives to undertake the Proposed Action. The organization of this Environmental Impact Statement (EIS) for Bremerton Waterfront Infrastructure Improvements is described below.

Document Organization

Executive Summary
This section is a brief description of the findings of the entire EIS for ease of use. The Executive Summary includes a table from Chapter 3 that summarizes potential impacts to environmental resources by alternative.

Acronyms and Abbreviations
This section defines acronyms and abbreviations used in the EIS.

Chapter 1. Purpose of and Need for the Proposed Action
This section introduces the project, provides background context, and describes the project location, purpose and need, applicable documents and relevant laws and regulations, and public and agency participation.

Chapter 2. Proposed Action and Alternatives
This chapter describes the Proposed Action, the alternatives screening process, and the alternatives considered for this EIS, which include:

- **Alternative 1:** No-Action Alternative
- **Alternative 2:** Multi-Mission Dry Dock (M2D2) at Dry Dock (DD) 3 (Preferred Alternative)
- **Alternative 3:** M2D2 at Mooring A

Table 2-2 summarizes demolition and construction actions associated with the no-action alternative and the two action alternatives.

Chapter 3. Affected Environment and Environmental Consequences

Chapter 3 examines the area that may be impacted by the alternatives under consideration, known as the *affected environment*, and then describes *environmental consequences* (impacts) associated with implementing the no-action and action alternatives. This section, beginning with an approach to analysis described in Section 3.1, examines the following resources: air quality, water resources, geological resources, biological resources, cultural resources, American Indian traditional resources, land use and recreation, visual resources, noise, utilities and infrastructure, transportation, marine navigation, public health and safety, hazardous materials and wastes, and socioeconomics.

These sections provide the baseline for evaluating the effects of the Proposed Action, including reasonably foreseeable future actions (RFFAs), and describes potential environmental impacts as a result of the alternatives.

Section 3.17 provides a summary table of potential impacts to environmental resources by alternative.

Chapter 4. Other Considerations Required by NEPA

This chapter explains how the EIS is consistent with other federal and state laws, plans, policies, and regulations. The chapter also describes any resources that are irreversibly or irretrievably committed to a project, lists any unavoidable adverse impacts, and presents the relationship between short-term use of the environment and long-term productivity.

Chapter 5. List of Preparers

This chapter provides a list of individuals involved in preparation of this EIS.

Chapter 6. Distribution List

This chapter lists the Federal, State, and Local agencies and organizations notified of the Draft EIS. Chapter 6 does not list private individuals who are also notified of the EIS availability.

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Executive Summary

ES.1 Proposed Action

The United States (U.S.) Department of the Navy (Navy) proposes to construct and operate a new multi-mission dry dock (M2D2) at Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) located at Naval Base (NAVBASE) Kitsap-Bremerton (Figure ES-1). The Proposed Action would include dredging to create adequate water depth at wharves and piers and as required for construction of new structures. The Navy would replace some existing shipyard functions affected by construction at PSNS & IMF with new facilities at NAVBASE Kitsap-Bangor (Figure ES-1). The Proposed Action does not include any changes in homeporting of Navy vessels.

The Navy published a notice of intent to prepare an EIS in the Federal Register on June 8, 2022 which discussed several projects that are no longer part of this Proposed Action. Three potential future actions - Pier 5 demolition, Pier 6 replacement, and Dry Dock (DD) 6 seismic upgrades - are not currently funded or programmed for implementation, and a future construction schedule has not been determined. If the Navy decides to proceed with these potential projects at a later date, the Navy will analyze potential environmental impacts in accordance with National Environmental Policy Act (NEPA) requirements and Navy implementation policies.

The Navy, as lead agency, along with the following cooperating agencies, the U.S. Army Corps of Engineers (USACE), Seattle District; and the U.S. Environmental Protection Agency (EPA), Region 10, prepared this Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA). The Navy also worked closely with the Suquamish Indian Tribe of the Port Madison Reservation (Suquamish Tribe), Skokomish Indian Tribe (Skokomish Tribe), Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Tribal Community (Lower Elwha Klallam Tribe) to develop this EIS.

The Navy would implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under the Clean Water Act (CWA) Section 404 (see Appendix F, *Compensatory Mitigation*).

ES.2 Purpose and Need for the Proposed Action

PSNS & IMF is the Navy's primary provider for maintenance, repair, modernization, inactivation, and recycling of ships, submarines, and aircraft carriers in the Pacific Fleet. PSNS & IMF is the only Navy shipyard on the West Coast with a dry dock that can accommodate nuclear-powered aircraft carriers for repair and maintenance. Additionally, PSNS & IMF is the only Navy shipyard approved to recycle nuclear-powered submarines.

Much of the shipyard's infrastructure is over 100 years old and was primarily designed for building and maintaining ship classes that are no longer part of the Naval fleet. Other than the construction of DD6 in the early 1960s, the shipyard has had few major infrastructure updates since World War II. This has led to significant ship maintenance delays. The shipyard lacks the necessary capacity and infrastructure to accommodate new and future classes of ships. For example, the Navy anticipates that DD1 and DD3 would be too small to support the Navy's needs in approximately 20 years.

The purpose of the Proposed Action is to address critical deficiencies in dry dock capability, capacity, and seismic survivability at NAVBASE Kitsap-Bremerton to enable PSNS & IMF to meet its mission to support the Navy's fleet.

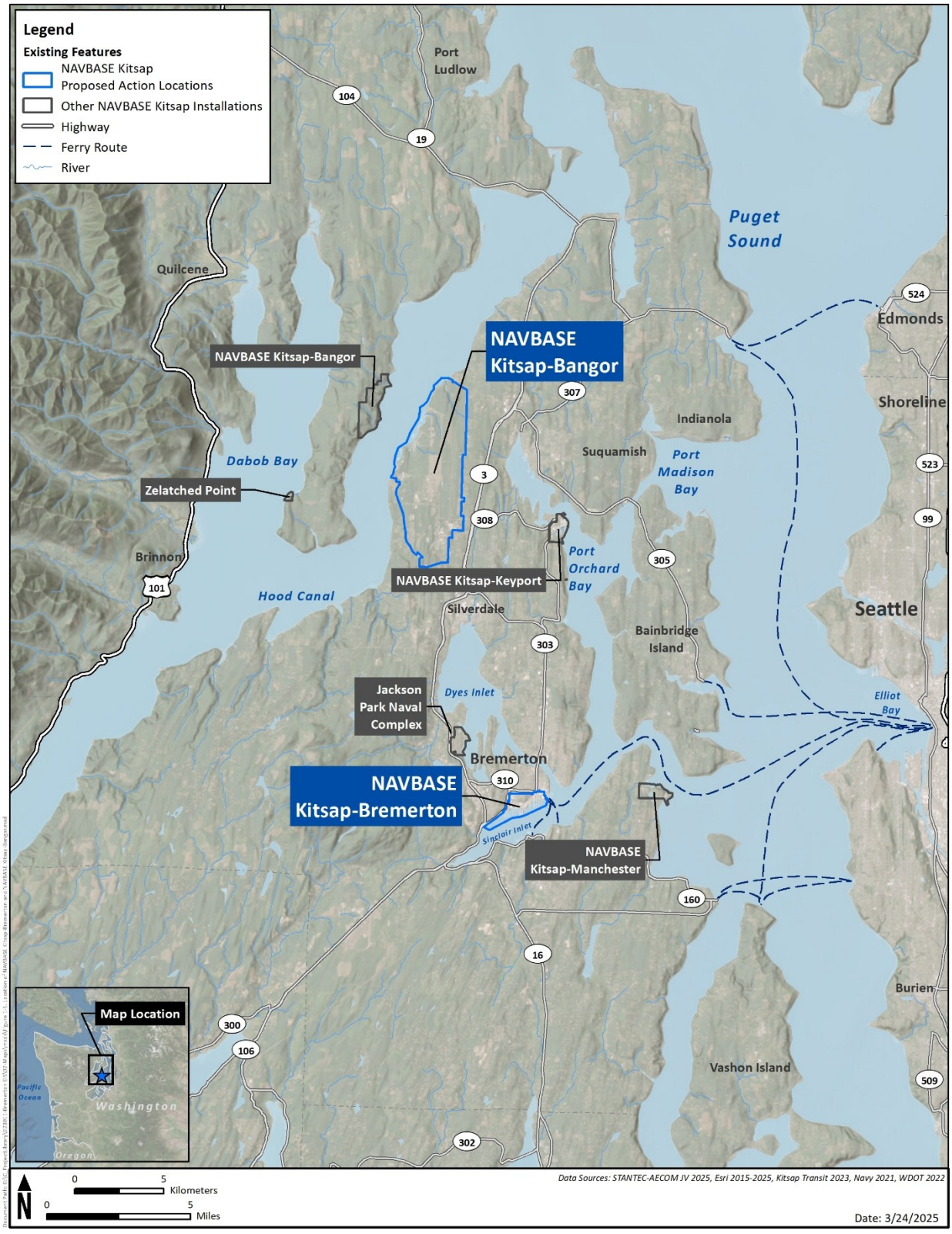

Figure ES-1 Location of NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor

The Proposed Action is needed because:

- PSNS & IMF does not have the dry dock capability to support the Navy's newest Ford-class carriers.
- PSNS & IMF does not have the dry dock and pier capacity to conduct the required future overhauling, refueling, inactivating, and recycling of nuclear-powered ships. PSNS & IMF must also maintain the capacity to perform emergent work such as battle damage repair.
- PSNS & IMF has the only dry dock on the West Coast that can accommodate a nuclear-powered aircraft carrier, and it does not meet current Department of Defense (DoD) Unified Facilities Criteria (UFC) design standards for seismic performance.

ES.3 Alternatives Considered

The Navy considered several alternatives to meet the purpose and need, such as alternative sites and/or Navy locations for a new M2D2, acquisition of a floating dry dock, and upgrading DD6 without building a new M2D2. Potential alternatives considered but not carried forward for detailed analysis in the EIS are described in Table 2-1 and alternatives carried forward for analysis are summarized in Table 2-2. The other potential alternatives were screened out because they would not be reasonable, practicable, or able to achieve the overall project purpose. As listed below, the Navy is considering a no-action alternative and two action alternatives that meet the purpose of and need for the Proposed Action.

ES.3.1 Alternative 1: No-Action Alternative

Under Alternative 1 (no-action alternative), the Proposed Action would not occur. The proposed M2D2 would not be constructed. The Navy would continue to maintain, repair, and operate existing facilities. However, without the proposed M2D2, the Navy would not be able to service their newest class of aircraft carriers anywhere on the West Coast. The no-action alternative would also diminish the shipyard's capability and capacity to service current and future classes of ships. As required by NEPA, the "no-action alternative" (Alternative 1) is carried forward for analysis in this EIS even though it does not meet the Navy's purpose and need because it serves to establish a comparative baseline for analysis of the action alternatives.

ES.3.2 Action Alternatives Carried Forward for Analysis

The Navy is considering two action alternatives that would meet the purpose of and need for the Proposed Action. The Navy developed action alternatives for analysis based on the following screening factors:

- Size: Would the dry dock be adequately sized to support Ford-class carrier maintenance per DoD UFC 4-213-10, Graving Dry Docks?
- Location: Would the dry dock location have reasonable access to an available and proficient aircraft carrier (CVN) maintenance workforce and associated CVN maintenance facilities, equipment, and utilities?
- Mission: Could construction be sequenced to avoid unacceptable impacts to achieving mission requirements?
- Practicable: Would the alternative utilize proven designs, materials, and construction techniques?

Action alternatives are described below and shown in Figures ES-2, ES-3, ES-4, and ES-5. Under Alternatives 2 and 3, a new M2D2 and other waterfront infrastructure components would be constructed. Alternative 2 would construct a new dry dock at the current location of DD3. The new dry dock and other waterfront infrastructure improvements would be constructed between 2027 and 2041. Alternative 3 would construct a new dry dock at the current location of Mooring A. The new dry dock and associated waterfront infrastructure improvements would also be constructed between 2027 and 2041. The Navy identified Alternative 2 as the preferred alternative because it would have fewer environmental impacts than Alternative 3, based on comparison of dredge areas, in-water fill, and net increase in overwater coverage. Table ES-1 presents a comparison of the components of each of these alternatives.

Table ES-1 Comparison of Alternatives Carried Forward

Component	***Alternative 1 No-Action Alternative***	***Alternative 2 (Preferred Alternative) M2D2 at DD3***	***Alternative 3 M2D2 at Mooring A***
M2D2 location	No M2D2 constructed	DD3	Mooring A
M2D2 Wharf	No M2D2 constructed	New Wharf 6 at M2D2 west wall New Wharf 7 at M2D2 east wall	New CVN repair Wharf 2 at M2D2 east wall
Temporary Construction Methods	No construction	• 18 temporary mooring buoys • Off-site contractor multi-use site(s) • Temporary cofferdam • Temporary construction access pier	• 18 temporary mooring buoys • Off-site contractor multi-use site(s) • Temporary construction access pier
Moorings E, F, and G	No change	No change	Modify mooring structures then relocate existing stored inactivated ships from Mooring A
Forge Shop	No change	Construct new forge shop at NAVBASE Kitsap-Bangor	No change
Parking garage at NAVBASE Kitsap-Bremerton	No new parking garage	No new parking garage	Construct new parking garage
Pier 2	No new Pier 2	Construct new Pier 2	No new Pier 2
Pier 4	No change	Demolish and replace	Demolish and replace
Pier 6	No change	Demolish and construct new Wharf 6 at M2D2 west wall	No change
Hammerhead Crane	No change	Deconstruct and remove	Deconstruct and remove
Pier 7	No change	Demolish and construct new Wharf 7 at M2D2 east wall	No change
Former Pier 8	No change	Remove select pile foundations	No change
Mooring A	No change	No change	Demolish
Dredging	No dredging	Dredge for adequate draft at wharves and piers, and as required for construction of new structures	Dredge to create a new turning basin, and as required for construction of new structures
Building Demolition and Replacement/ Construction	No change	Building demolition and replacement (Table 2-4)	Building demolition and replacement (Table 2-7)

Component	*Alternative 1 No-Action Alternative*	*Alternative 2 (Preferred Alternative) M2D2 at DD3*	*Alternative 3 M2D2 at Mooring A*
Radio Hill complex at NAVBASE Kitsap-Bangor	No change	Expand Radio Hill complex	Expand Radio Hill complex

Legend: CVN = aircraft carrier; DD = dry dock; M2D2 = multi-mission dry dock; NAVBASE = Naval Base

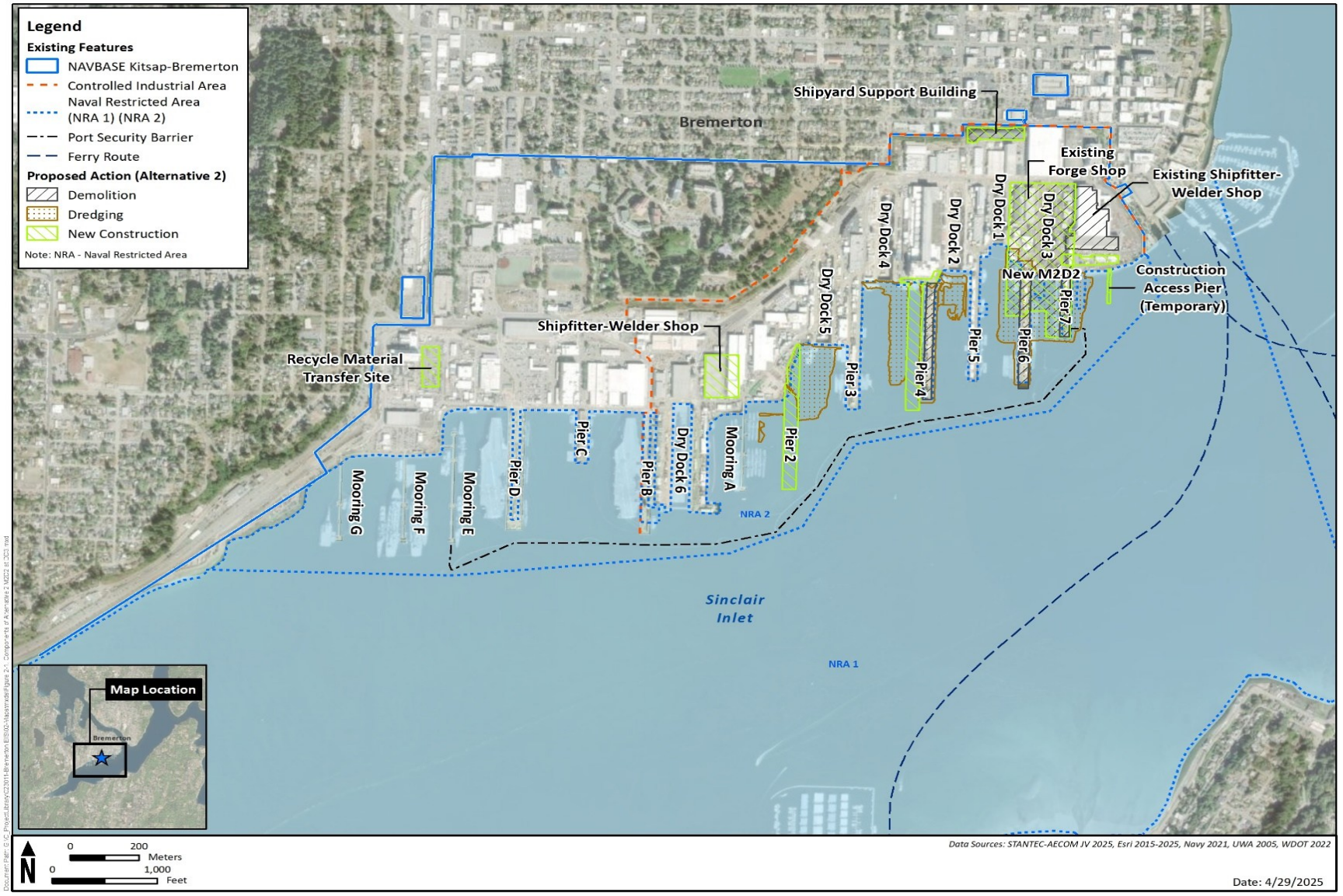

Figure ES-2 Components of Alternative 2: M2D2 at DD3

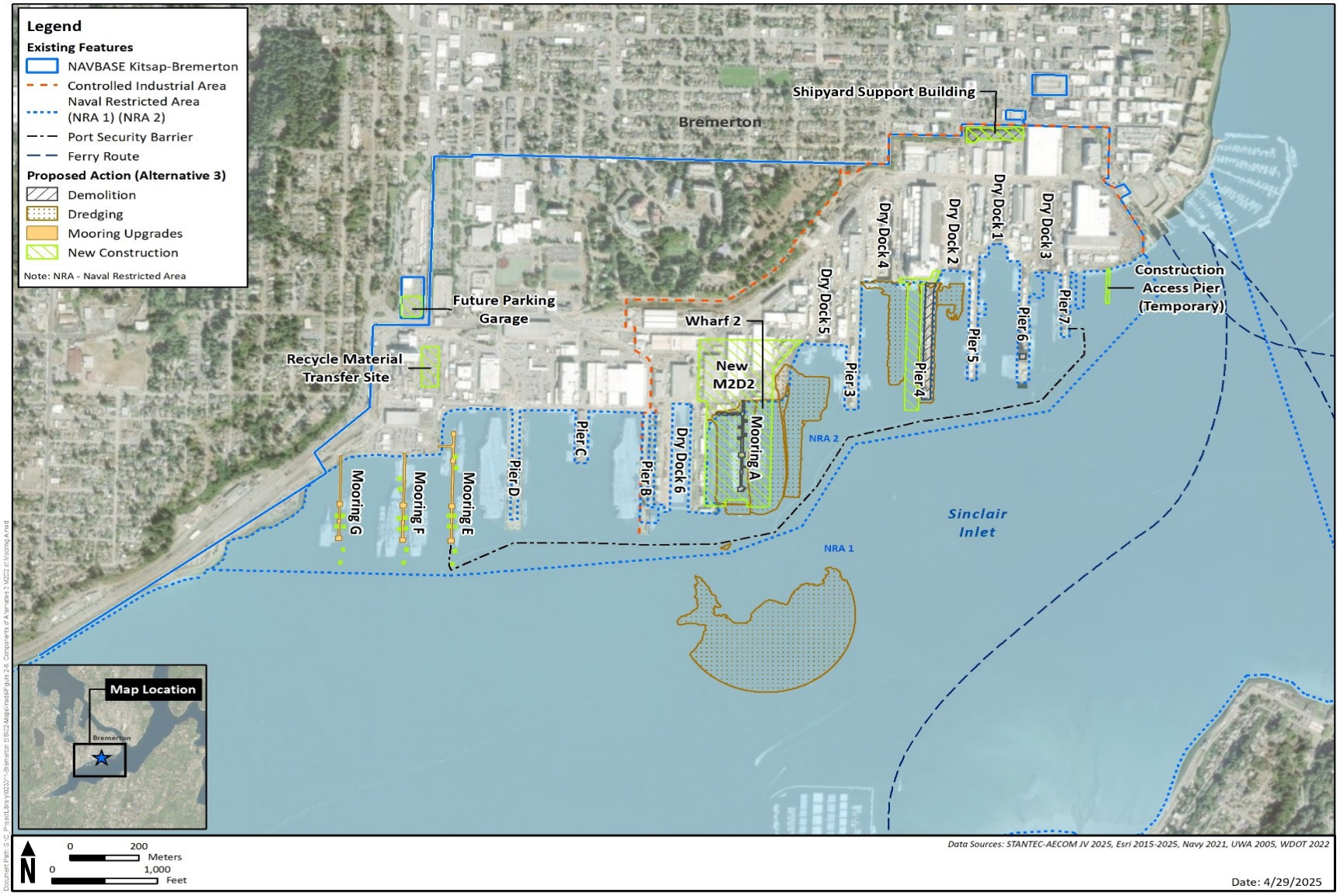

Figure ES-3 Components of Alternative 3: M2D2 at Mooring A

Figure ES-4 Components of Alternative 2 at NAVBASE Kitsap-Bangor

Figure ES-5 Components of Alternative 3 at NAVBASE Kitsap-Bangor

ES.3.3 Summary of Potential Environmental Impacts of the Alternatives

NEPA requires the Navy to analyze and consider the environmental impacts of proposed major federal actions as part of its decision-making process. The extent of analysis coincides with the anticipated level of impact. Table ES-2 provides a general summary of impacts that could occur to the following resources as a result of action alternatives, with consideration of best management practices (BMPs): air quality, water resources, geological resources, biological resources, cultural resources, American Indian traditional resources, land use and recreation, visual resources, noise, utilities and infrastructure, transportation, marine navigation, public health and safety, hazardous materials and wastes, and socioeconomics. A more detailed summary of potential environmental impacts is presented in Section 3.17, Table 3.17-1.

Table ES-2 Summary of Potential Impacts to Resources Analyzed by Alternative

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
3.2 Air Quality	No change	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap Bangor** Direct GHG emissions of approximately 473,290 tons of CO_2e between 2027 and 2041. Application of BMPs AQ BREM-1 through 5 and AQ BANGOR-1 through 5 would reduce emissions and thus reduce pollutant concentrations at any given location. Emissions from construction and operations under Alternative 2 would not cause a violation of the NAAQS or appreciably increase health risks to the public.	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Direct GHG emissions from all years of construction under Alternative 3 (2027 to 2041) would be slightly higher than those from Alternative 2, at 478,982 tons of CO_2e. Application of BMPs AQ BREM-1 through 5 and AQ BANGOR-1 through 5 would reduce emissions and thus reduce pollutant concentrations at any given location. Emissions from construction and operations under Alternative 3 would not cause a violation of the NAAQS or appreciably increase health risks to the public.
3.3 Water Resources	No change	**NAVBASE Kitsap-Bremerton** The regulatory turbidity criterion (i.e., 5 NTU over background when background is 50 NTU or less per Chapter 173-201A WAC) would not be exceeded at the 150-foot compliance boundary from the proposed dredging activities or pile removal/installation activities. Net gain of up to 354,500 square feet of impervious surface Discharge of fill below mean higher high water – 550,600 cubic yards During construction and operations, management, treatment, and discharge of groundwater and stormwater to Sinclair Inlet would be in compliance with applicable permits. The new outfall and diffuser would be located and configured to address potential localized impacts to ambient water quality. BMPs would be implemented to reduce impacts to water quality and to wetlands and shorelines. Compensatory mitigation actions would mitigate impacts to	**NAVBASE Kitsap-Bremerton** The regulatory turbidity criterion (i.e., 5 NTU over background when background is 50 NTU or less per Chapter 173-201A WAC) would not be exceeded at the 150-foot compliance boundary from the proposed dredging activities or pile removal/installation activities. Net gain of up to 433,000 square feet of impervious surface. Discharge of fill below mean higher high water – 1,179,800 cubic yards During construction and operations, management, treatment, and discharge of groundwater and stormwater to Sinclair Inlet and dredging operations would be the same as described for Alternative 2. **NAVBASE Kitsap-Bangor** Net gain of 652,000 square feet of impervious surface. Through compliance with the NAVBASE Kitsap-Bangor's coverage under EPA's Construction General Permit if construction is greater than

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		aquatic resources in accordance with Clean Water Act Section 404. **NAVBASE Kitsap-Bangor** Net gain of 872,000 square feet of impervious surface. Through compliance with the NAVBASE Kitsap-Bangor's coverage under EPA's Construction General Permit if construction is greater than 1 acre, as well as UFC 3-210-10, LID and EISA Section 438, impacts would be minimized to groundwater and nearby surface waters and wetlands during construction and operations.	1 acre, as well as UFC 3-210-10, LID and EISA Section 438, impacts would be minimized to groundwater and nearby surface waters and wetlands during construction and operations.
3.4 Geological Resources	No change	**NAVBASE Kitsap-Bremerton** Approximately 896,250 cubic yards of excavation and 484,000 cubic yards of fill above mean higher high water (MHHW). Dredging for new construction would result in removal of 867,450 cubic yards of marine sediment across approximately 37 acres, resulting in a localized, temporary, and intermittent adverse impact to benthic organisms and marine life from resuspension of sediment and longer term beneficial effects by reducing the volume of contaminated sediment and surface sediment contaminant concentrations. Water quality monitoring will be implemented throughout the project to ensure compliance with state and water quality standards. With implementation of BMPs, temporary adverse impacts would be minimal. Changes to bathymetry as a result of dredging would be minimal and the seafloor topography would remain relatively flat, consistent with existing conditions.	**NAVBASE Kitsap-Bremerton** Alternative 3 would involve less excavation than Alternative 2, with 713,000 cubic yards of excavation, but increased fill with approximately 694,000 cubic yards above MHHW. Alternative 3 would involve more dredging than Alternative 2, with removal of 1,651,000 cubic yards of marine sediment across 69 acres. Changes to bathymetry as a result of dredging would be minimal and the seafloor topography would remain relatively flat, consistent with existing conditions. Stormwater construction BMPs and installation of temporary retaining structures implemented during construction and operations. **NAVBASE Kitsap-Bangor** Impacts to topography, geology, and soils would be similar to those described for Alternative 2 but with reduced impacts under Alternative 3. Implement appropriate erosion control BMPs in accordance with a project-specific construction SWPPP and in compliance with

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		Stormwater construction BMPs and installation of temporary retaining structures implemented during construction and operations. **NAVBASE Kitsap-Bangor** Construction activities associated with the Radio Hill complex expansion and forge shop at NAVBASE Kitsap-Bangor would include clearing, grading, excavating, and filling. Implement appropriate erosion control BMPs in accordance with a project-specific construction SWPPP and in compliance with coverage provisions under the NPDES construction stormwater general permit.	coverage provisions under the NPDES construction stormwater general permit.
3.5 Biological Resources	No change	**NAVBASE Kitsap-Bremerton** Impacts to wildlife include airborne and in-water noise, water quality degradation through turbidity, temporary displacement of federally managed fish and their prey, fish entrainment, nearshore barriers and overwater shading (created by cofferdams and barges), and overwater lighting. During construction, the project would comply with water quality standards through a project-specific water quality monitoring and protection plan, including a compliance radius of 150 feet from work location. Potential adverse impacts from vessel strike or disturbance to benthic environment from vessel traffic, night lighting, and shading at barge moorings. BMPs such as bubble curtains used to attenuate in-water noise during impact pile driving of steel piles; and monitoring for presence of marbled murrelets and marine mammals during in-water demolition and construction activities would be implemented. BMPs during vessel	**NAVBASE Kitsap-Bremerton** Demolition, Construction, and Operations ROI – similar as duration as Alternative 2 but would result in more loss of aquatic vegetation and benthic invertebrates as well as a larger net increase in overwater coverage as compared to Alternative 2. BMPs would be implemented to minimize impacts during demolition, construction, and operations. Net change of 5.47 acres of overwater coverage. **NAVBASE Kitsap-Bangor** A loss of vegetation habitat would result but would be less than under Alternative 2. Consultation with USFWS for potential impacts to marbled murrelet for demolition, construction, and operations.

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		operations/transits would be implemented to minimize impacts to aquatic species. Adverse effects to EFH through long-term improvement to benthic and aquatic vegetation habitat and through removal of creosote-treated structures and contaminated sediment. Net change of 1.37 acres of overwater coverage. The new outfall and diffuser would be located and configured to address potential localized impacts to ambient water quality. The new outfall could result in localized impacts to fish species due to increased temperature in the vicinity of the outfall. Consultation with NMFS for ESA-listed species, designated critical habitat, EFH, and MMPA and with USFWS for ESA-listed species and designated critical habitat. **NAVBASE Kitsap-Bangor** Clearing and increased human activity during construction would result in loss of habitat that may affect ESA-listed marbled murrelet. Consultation with USFWS for potential impacts to marbled murrelet for demolition, construction, and operations.	
3.6 Cultural Resources	No change	**NAVBASE Kitsap-Bremerton** The PSNS Historic District and NHL would be altered. Demolition of 17 historic properties. All 17 historic properties contribute to the PSNS Historic District, and 13 also contribute to the NHL. Construction would also change the setting of cultural resources, and potential disturbance of archaeological resources. Construction would result in the	**NAVBASE Kitsap-Bremerton** The PSNS Historic District and NHL would be altered. Demolition of 5 historic properties. All 5 historic properties contribute to the PSNS Historic District, 3 contribute to the NHL, and 1 is NRHP individually eligible. The new M2D2 would be constructed in the PSNS Historic District. Alterations to Moorings E, F, and G would not impact historic properties.

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		removal of the historic Hammerhead Crane and rail systems that also contribute to the PSNS Historic District. Pursuant to Section 106, adverse effects to historic properties would be resolved through consultation and implementation of a Memorandum of Agreement. **NAVBASE Kitsap-Bangor** No impacts to known cultural resources would occur. Construction activities could disturb previously unidentified archaeological resources. No impacts from operations expected at NAVBASE Kitsap-Bremerton or NAVBASE Kitsap-Bangor.	**NAVBASE Kitsap-Bangor** No impacts to known cultural resources would occur. Construction activities could disturb previously unidentified archaeological resources. No impacts from operations expected at NAVBASE Kitsap-Bremerton or NAVBASE Kitsap-Bangor.
3.7 American Indian Traditional Resources	No change	**NAVBASE Kitsap-Bremerton** Impacts on the availability and harvestability of traditional resources and interference with Tribal fishing during construction. Installation and operation of a permanent outfall and diffuser could permanently interfere with Tribal fishing in the location of the structures. Government-to-government consultation with Tribes. **NAVBASE Kitsap-Bangor** Reduction in the amount of forest land available for Tribal harvest during construction and operations.	**NAVBASE Kitsap-Bremerton** Impacts on the availability and harvestability of traditional resources and interference with Tribal fishing during construction. Impacts during operations would be the same as Alternative 2. Government-to-government consultation with Tribes. **NAVBASE Kitsap-Bangor** Reduction in the amount of forest land available for Tribal harvest during construction and operations.
3.8 Land Use and Recreation	No change	**NAVBASE Kitsap-Bremerton** There would be no impacts to land use at NAVBASE Kitsap-Bremerton from Alternative 2. Construction impact to recreational fisheries for salmon, especially Chinook, and other fish in Sinclair Inlet. No impacts to recreation from operations.	**NAVBASE Kitsap-Bremerton** There would be no impacts to land use at NAVBASE Kitsap-Bremerton from Alternative 3. Construction impacts to recreational fisheries for salmon, especially Chinook, and other fish would be similar to Alternative 2.

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		NAVBASE Kitsap-Bangor The proposed changes would be consistent with the current NAVBASE Kitsap-Bangor land use designations. No impacts from operations.	**NAVBASE Kitsap-Bangor** The proposed changes would be consistent with the current NAVBASE Kitsap-Bangor land use designations. No impacts from operations.
3.9 Visual Resources	No change	**NAVBASE Kitsap-Bremerton** Loss of a prominent visual resource with deconstruction and removal of the Hammerhead Crane. The Ford-class carrier(s), when present during operations, would be more discernible but consistent with the existing shipyard and industrial landscape character. During operations, new facilities and other replacement buildings would be similar in character to existing facilities on NAVBASE Kitsap-Bremerton. The new shipyard support building would be taller than the existing structure and block some background views. **NAVBASE Kitsap-Bangor** No public views of the forge shop or Radio Hill complex expansion and no visual resources impacts associated with the actions at NAVBASE Kitsap-Bangor. During operations, new buildings would be consistent with the industrial character of other structures that support military operations.	**NAVBASE Kitsap-Bremerton** Under Alternative 3, the degree of visual construction-related impacts would be less than under Alternative 2. Visual impact from deconstruction and removal of the Hammerhead Crane would be the same as Alternative 2. Construct a new parking garage at the corner of Charleston Boulevard and Farragut Street on an existing surface parking lot. Similar to Alternative 2, construction activities would be consistent with the existing shipyard and industrial landscape character. **NAVBASE Kitsap-Bangor** No public views of the Radio Hill complex expansion and no visual resources impacts associated with actions at NAVBASE Kitsap-Bangor. New buildings would be consistent with the industrial character of other structures that support military operations and impacts would be less than Alternative 2 because no forge shop would be constructed.

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
3.10 Noise	No change	**NAVBASE Kitsap-Bremerton** Temporary increase in noise associated with construction-related activities and potential for impacts to noise sensitive areas. Thirteen locations would experience L_{eq} 70 dB or greater during pile driving, an increase of 5 to 20 dB from the estimated existing conditions. The greatest school L_{eq} under Alternative 2 would be 73-81 dB. **NAVBASE Kitsap-Bangor** Noise levels at noise sensitive areas due to construction equipment at the proposed forge shop location and Radio Hill complex expansion site during the construction phase would range from 50 to 65 dB L_{max}, which would be similar in L_{max} to a passing road vehicle. Relocation of aircraft carrier maintenance to the east end of the shipyard would change noise levels that could be more noticeable to off-site receptors at NAVBASE Kitsap-Bremerton. Operation of the new forge shop would add a new source of noise at NAVBASE Kitsap-Bangor.	**NAVBASE Kitsap-Bremerton** Temporary increase in noise associated with construction-related activities and potential for impacts to noise sensitive areas. There would be a greater distance between the nearest schools and the proposed pile driving locations under Alternative 3 than Alternative 2. The greatest school L_{eq} under Alternative 3 would be approximately 72-79 dB. **NAVBASE Kitsap-Bangor** Construction-related noise impacts at NAVBASE Kitsap-Bangor would be less than described in Alternative 2 because Alternative 3 does not include construction of the forge shop. Impacts to noise from operations would be similar to existing operations at both NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.
3.11 Utilities and Infrastructure	No change	**NAVBASE Kitsap-Bremerton** Disruption of utility service due to relocating utilities or when connecting or disconnecting utilities during construction. Impacts would be short-term (less than 12 hours for most utilities) and localized to areas at PSNS & IMF where work was occurring. Implementation of BMPs to reduce disruptions, such as scheduling utility turnovers outside of normal working hours or on weekends during construction. **NAVBASE Kitsap-Bangor** Impacts would be similar to the impacts at NAVBASE Kitsap-Bremerton, but of a lesser magnitude because less construction would take place at this installation.	**NAVBASE Kitsap-Bremerton** Similar to Alternative 2, except impacts would be of a lesser magnitude because Alternative 3 includes less demolition and construction. **NAVBASE Kitsap-Bangor** Similar to Alternative 2, except impacts would be of a lesser magnitude because the new forge shop would not be located at this installation. During operations, all utilities would be installed and functional. Increases would be addressed through final design.

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		During operations, all utilities would be installed and functional. Increases in demand would be addressed through final design.	
3.12 Transportation	No change	**NAVBASE Kitsap-Bremerton** Degradation of LOS during peak hours at the following intersections: • Shift 1 p.m.: SR 3 at Sam Christopherson Avenue intersection (Int #9) at LOS F related to additional project trips on eastbound through movement. • Shift 1 p.m.: SR 3 at Imperial Way intersection (Int #10) at LOS F related to additional project trips on eastbound left turn movement. • Shift 2 a.m.: SR 3 at Sam Christopherson Avenue intersection (Int #9) at LOS F related to additional project trips on northbound left turn and westbound through movements. • Shift 2 p.m.: SR 3 at Imperial Way intersection (Int #10) at LOS F related to additional project trips on southbound movements. Mitigation measures such as adjusting worker shift times, using construction flag men, or restriping would reduce impacts to an acceptable Level of Service. Approximately 100-150 construction worker vehicles would park within the City of Bremerton and walk to NAVBASE Kitsap-Bremerton to work during the peak construction period. This could incrementally add to parking issues identified by the City of Bremerton. The Navy would address on-installation parking issues as part of construction management. The Navy will continue to coordinate with the City of Bremerton regarding the findings	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** There would be no appreciable difference in impacts associated with construction or operations for Alternative 3 over Alternative 2.

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		and recommendations of the Joint Compatibility Transportation Plan. No primary installation operational changes are expected under Alternative 2. **NAVBASE Kitsap-Bangor** Approximately 100 workers per day during construction of the forge shop and up to 50 workers per day for the Radio Hill complex expansion would generate trips within the local roadway network. During operations, the expansion of the Radio Hill complex would incrementally increase traffic on local roadways but would not impact congestion due to low traffic volumes.	
3.13 Marine Navigation	No change	**NAVBASE Kitsap-Bremerton** Increased number of vessels in and around the construction sites. Increased vessel traffic beyond Sinclair Inlet and Rich Passage for transport of equipment, material, and personnel. Naval marine traffic volumes and operation of the port security barrier would return to pre-construction levels once construction is complete. Therefore, there are no expected impacts to existing marine traffic during operations. **NAVBASE Kitsap-Bangor** No marine traffic required for construction and operation of the proposed facilities at NAVBASE Kitsap-Bangor.	**NAVBASE Kitsap-Bremerton** Increased number of vessels in and around the construction sites. Increased vessel traffic beyond Sinclair Inlet and Rich Passage for transport of equipment, material, and personnel. Naval marine traffic volumes and operation of the port security barrier would return to pre-construction levels once construction is complete. Therefore, there are no expected impacts to existing marine traffic during operations. **NAVBASE Kitsap-Bangor** No marine traffic required for construction and operation of the proposed facilities at NAVBASE Kitsap-Bangor.
3.14 Public Health and Safety	No change	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Increase in construction traffic, noise, and the use of hazardous substances (i.e., POLs) and the generation of solid waste and potentially hazardous waste.	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Increase in construction traffic, noise, and the use of hazardous substances (i.e., POLs) and the generation of solid waste and potentially hazardous waste.

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		Ground disturbance in areas of known contamination. Construction BMPs to minimize impacts. Operations impacts to public health and safety would be similar to existing operational activities at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.	Ground disturbance in areas of known contamination. Construction BMPs to minimize impacts. Operations impacts to public health and safety would be similar to existing operational activities at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.
3.15 Hazardous Materials and Wastes	No change	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Increase in the use of hazardous substances (i.e., POLs) and the generation of solid waste and potentially hazardous waste. In-water work (at NAVBASE Kitsap-Bremerton) or ground disturbance (at NAVBASE Kitsap-Bangor and NAVBASE Kitsap-Bremerton) in areas of known contamination. Construction BMPs to minimize impacts. Impacts from operations would be similar to existing shipyard operations.	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Increase in the use of hazardous substances (i.e., POLs) and the generation of solid waste and potentially hazardous waste. In-water work (at NAVBASE Kitsap-Bremerton) or ground disturbance (at NAVBASE Kitsap-Bangor and NAVBASE Kitsap-Bremerton) in areas of known contamination. Construction of the new M2D2 would occur 'in the wet,'. The potential for impacts from hazardous materials and waste are higher with Alternative 3. Construction BMPs to minimize impacts. Impacts to operations would be similar to existing shipyard operations.
3.16 Socioeconomics	No change	**<u>NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor</u>** <u>Population</u> 114 workers moving to the area with a population increase of 285 people. <u>Schools</u> A total of 46 students at the peak of construction which would be an increase in the number of students in the ROI of less than 0.2 percent. This would be a minor temporary adverse impact.	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Impacts under Alternative 3 would be similar to those described for Alternative 2. Operational employment and local expenditures within Kitsap County would remain similar to current levels. .

Section and Resource	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		<u>Housing</u> 114 housing units would equate to 1.4 percent of the total vacant housing units in the ROI. <u>Employment and Income</u> 1,214 direct, indirect, and induced jobs per year. Labor income supported by construction activities would total approximately $76.4 million per year. The increased jobs and labor income in the ROI would be a moderate beneficial impact. <u>Economic Activity</u> Construction spending and hiring in would be an estimated increase of $89.2 million per year. The stimulated local economy would be a moderate temporary beneficial impact. <u>State and Local Taxes</u> Tax revenues including an estimated $1.7 million per year to the State of Washington and $316,163 per year to Kitsap County. The increase in tax revenues would be a moderate temporary beneficial impact. Operational employment and local expenditures within Kitsap County would remain similar to current levels.	

Legend: ACHP = Advisory Council on Historic Preservation; BMP = best management practice; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CM = cubic meter; CMP = Compensatory Mitigation Plan; COC = contaminant of concern; CWA = Clean Water Act; CY = cubic yard; dB = decibel; DD = Dry Dock; DNL = Day-Night Average Sound Level; DoD = Department of Defense; DU = Decision Unit; Ecology = Washington Department of Ecology; EFH = Essential Fish Habitat; ESA = Endangered Species Act; GHG = greenhouse gas; HAP = hazardous air pollutant; KOP = key observation point; L_{eq} = equivalent sound level; L_{max} = maximum sound level; M2D2 = multi-mission dry dock; MBTA = Migratory Bird Treaty Act; NAAQS = national ambient air quality standards; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; NHL = National Historic Landmark; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; NPDES = National Pollutant Discharge Elimination System; NPS = National Park Service; OU = Operable Unit; POLs = petroleum, oils, lubricants; PSNS = Puget Sound Naval Shipyard; RFFA = reasonably foreseeable future action; ROD = Record of Decision; ROI = region of interest; SF = square feet; SHPO = State Historic Preservation Officer; SWPPP = Stormwater pollution prevention plan; U.S. = United States; UFC = United Facilities Criteria; USACE = U.S. Army Corps of Engineers; EPA = Environmental Protection Agency; USFWS = U.S. Fish and Wildlife Service; WOTUS = waters of the United States

ES.3.4 Public Involvement

The Navy published a Notice of Intent to prepare an EIS in the Federal Register on June 8, 2022 (Volume 87, number 110). A Notice of Intent announced the public scoping period, the day and time of the public scoping meeting, and opportunities for public comment. The Navy also invited public engagement and comments pursuant to the National Historic Preservation Act (NHPA) Section 106 process beginning with this scoping process. Notices announcing the intent to prepare an EIS and details of the public scoping meeting were published in the following newspapers:

- *Seattle Times* (June 9, 10, and 11, 2022)
- *Kitsap Sun* (June 9, 10, and 11, 2022)

The Navy also published additional notices announcing the public scoping meeting in the following newspapers:

- *Seattle Times* (June 16, 20, 21, and 22, 2022)
- *Kitsap Sun* (June 16, 20, 21, and 22, 2022)
- *North Kitsap Herald* (June 17, 2022)
- *Port Orchard Independent* (June 17, 2022)

The Navy solicited public and agency comments during a scoping period from June 8, 2022, through July 11, 2022. The Navy provided the following web-based platforms to inform the public about the Proposed Action:

- Virtual scoping meeting on June 23, 2022, from 5:30–6:30 p.m. Pacific Time
- EIS website (www.BremertonWaterfrontImprovementsEIS.com) live on June 8, 2022, and will remain active through the Record of Decision
- Project Email (info@BremertonWaterfrontImprovementsEIS.com)

The Navy accepted scoping comments through the virtual scoping meeting, project website, project email, and via mail at Naval Facilities Engineering Systems Command Northwest, Attn: Bremerton EIS Project Manager, 1101 Tautog Circle, Room 210, Silverdale, Washington 98315.

During the scoping period, which ran from June 8, 2022 to July 11, 2022, 26 submittals were received from the public, tribes, and agencies. Of those 26 submittals, 61 comments were received. The submittals included:

- 6 letters via the project email/website (Washington [WA] State Department of Transportation [WSDOT] Ferries, WA State Department of Ecology (Ecology), U.S. Environmental Protection Agency [EPA], U.S. National Park Service [NPS], City of Bremerton, Suquamish Tribe)
- 9 comments received at the virtual public scoping meeting
- 7 comments received from private citizens via the project email/website
- 4 emails from agencies with “No comment at this time” (U.S. Bureau of Reclamation, U.S. Geological Survey, U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration [NOAA])

The Navy considered comments received during the scoping period when preparing the Draft EIS and complying with Section 106 of the NHPA. Scoping comments influenced analysis in some resource sections (Table 1-4). A Scoping Summary Report is provided in Appendix B.

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Acronyms and Abbreviations

Acronyms	Definition
ACHP	Advisory Council on Historic Preservation
ADP	Area Development Plan
AST	aboveground storage tank
ATFP	Anti-Terrorism Force Protection
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CAD	Confined Aquatic Disposal
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIA	Controlled Industrial Area
CNIC	Commander, Navy Installations Command
CO	carbon monoxide
CO_2	carbon dioxide
CO_2eq	carbon dioxide equivalent
COC	contaminant of concern
CVN	aircraft carrier
CWA	Clean Water Act
dB	decibel
dB RMS re 1 µPa	referenced to a pressure of 1 micro Pascal
DD	Dry Dock
DMMP	Dredged Materials Management Program
DNL	Day-Night Average Sound Level
DoD	U.S. Department of Defense
DOE	Department of Energy
DPS	Distinct Population Segment
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESAMS	Enterprise Safety Application Management System
ESQD	explosive safety quantity distance
FEMA	Federal Emergency Management Agency
FR	Federal Register
GHG	greenhouse gas
GPM	gallons per minute

Acronyms	Definition
GWP	global warming potential
HAP	hazardous air pollutant
HRA	Historical Research Associates
IAP	Installation Appearance Plan
IDP	Installation Development Plan
IMPLAN	Impact Analysis for Planning
INRMP	Integrated Natural Resources Management Plan
IR	installation restoration
KOP	key observation point
LAAS	Larson Anthropological Archaeological Services Limited
L_{eq}	equivalent sound level
LID	Low impact development
L_{max}	maximum sound level
LOS	level of service
M2D2	multi-mission dry dock
MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
mg/kg OC	milligrams per kilogram organic carbon
MIL-STD	Military Standard
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NAVBASE	Naval Base
NAVFAC	Naval Facilities Engineering Systems Command
NAVSEA	Naval Sea Systems Command Headquarters
Navy	U.S. Department of the Navy
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRA	Naval Restricted Area
NRHP	National Register of Historic Places

Acronyms	Definition
NRNW	Navy Region Northwest
NTU	nephelometric turbidity unit
NWI	National Wetlands Inventory
O_3	ozone
OU	Operable Unit
OWTS	oily waste treatment system
PCB	polychlorinated biphenyl
PFAS	per and polyfluoroalkyl substances
PFMC	Pacific Fishery Management Council
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
POLs	petroleum, oils, lubricants
PSB	Port Security Barrier
PSCAA	Puget Sound Clean Air Agency
PSNS & IMF	Puget Sound Naval Shipyard & Intermediate Maintenance Facility
PTS	permanent threshold shift
PWOWTS	process water/oily waste treatment system
PWCS	process water collection system
RFFA	reasonably foreseeable future action
RCD	reactor compartment disposal
RCW	Revised Code of Washington
RMS	root mean square
ROD	Record of Decision
ROI	Region of Influence
SEL	sound exposure level
SEL_{cum}	cumulative sound exposure level
SHPO	State Historic Preservation Officer
SIOP	Shipyard Infrastructure Optimization Program
SMS	Sediment Management Standards
SO_2	sulfur dioxide
SR	State Route
Stell	Stell Environmental Enterprises, Inc.
SWPPP	Stormwater Pollution Prevention Plan
TAC	toxic air contaminant
TCP	Traditional Cultural Place
TMDL	Total Maximum Daily Load
TTS	temporary threshold shift
U&A	usual and accustomed
U.S.	United States
U.S.C.	U.S. Code
UFC	United Facilities Criteria
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compounds
WA	Washington
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WSDOT	Washington State Department of Transportation
WQI	water quality improvement

1 Purpose of and Need for the Proposed Action

1.1 Introduction

The United States (U.S.) Department of the Navy (Navy) proposes to construct and operate a new multi-mission dry dock (M2D2) at Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) on Naval Base (NAVBASE) Kitsap-Bremerton. The Proposed Action also includes dredging to create adequate water depth at wharves and piers and as required for construction of new structures. Some existing upland shipyard functions affected by construction at PSNS & IMF would be moved to NAVBASE Kitsap-Bangor.

The Proposed Action does not include any changes in homeporting of Navy vessels. NAVBASE Kitsap, a Command of the Navy, is the lead action proponent; Program Management Office 555 (PMO 555), Shipyard Infrastructure Optimization Program (SIOP) and Naval Sea Systems Command's PSNS & IMF are co-action proponents.

The Navy published a notice of intent to prepare an EIS in the Federal Register on June 8, 2022 which discussed several projects that are no longer part of this Proposed Action. Three potential future actions—Pier 5 demolition, Pier 6 replacement, and Dry Dock (DD) 6 seismic upgrades—are not currently funded or programmed for implementation, and a future construction schedule has not been determined. If the Navy decides to proceed with these potential projects at a later date, the Navy will analyze potential environmental impacts in accordance with National Environmental Policy Act (NEPA) requirements and Navy implementation policies.

The Navy is preparing this Environmental Impact Statement (EIS) in accordance with NEPA. The Navy worked closely with the Suquamish Indian Tribe of the Port Madison Reservation (Suquamish Tribe), Skokomish Indian Tribe (Skokomish Tribe), Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Tribal Community (Lower Elwha Klallam Tribe) to develop this EIS. The following are cooperating agencies for this EIS:

- U.S. Army Corps of Engineers (USACE), Seattle District, with jurisdiction under the Clean Water Act (CWA) and Rivers and Harbors Act.
- U.S. Environmental Protection Agency (EPA), Region 10, with jurisdiction under the Clean Air Act (CAA); CWA; and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

1.2 Background

The Navy's four shipyards – PSNS & IMF, Norfolk Naval Shipyard, Portsmouth Naval Shipyard, and Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility – were established in the 19th and 20th centuries to support ship construction and maintenance. Due to their age, and now poor structural condition, the shipyards do not meet the Navy's operational needs. In fiscal years 2000 through 2016, inadequate facilities and equipment led to maintenance delays that contributed in part to more than 1,300 lost operational days for aircraft carriers and 12,500 lost operational days for submarines (U.S. Government Accountability Office 2017). In February 2018, the Secretary of the Navy established the Shipyard Infrastructure Optimization Program, a comprehensive approach to address facility, equipment, and performance improvements to ensure that Naval shipyards are meeting the U.S. Naval Fleet's needs.

The Navy formally established PSNS & IMF as Naval Station Puget Sound in 1891, with a mission to construct and maintain the U.S. Naval Fleet. Its first dry dock, DD1, was completed in 1896, and is still in use today. Four additional dry docks were constructed over the next 50 years, with DD2 and DD3 completed in 1919, and DD4 and DD5 completed in 1941. The shipyard's most recent dry dock, DD6, was completed in 1962.

1.3 Locations

PSNS & IMF is located at NAVBASE Kitsap-Bremerton, on the north side of Sinclair Inlet within the city of Bremerton in Kitsap County, Washington (Figure 1-1). NAVBASE Kitsap-Bremerton encompasses approximately 380 acres of land and approximately 400 acres of submerged marine lands (Navy 2018) along 3.5 miles of Sinclair Inlet shoreline (Navy 2016). PSNS & IMF is a tenant command located within the boundaries of NAVBASE Kitsap-Bremerton. A tenant command is a unit located on a Navy installation that is not part of the installation's chain of command. The majority of vessel maintenance occurs within a secure controlled industrial area (CIA) on the eastern portion of the installation (Figure 1-2). Structures within the CIA include large industrial shops and warehouses, smaller ship support facilities, and temporary structures. In-water structures include six dry docks for wet or dry berthing of Navy vessels, numerous piers, wharves, moorings, and quay walls (hardened walls built parallel to the shore that can be used to dock floating vessels).

NAVBASE Kitsap-Bangor is located along Hood Canal, approximately 20 miles west of Seattle and approximately 12 miles north of NAVBASE Kitsap-Bremerton (Figure 1-1). The installation encompasses approximately 7,000 acres including developed land (military, industrial, residential, commercial, and recreational uses), forested lands, and brush and shrub lands. NAVBASE Kitsap-Bangor occupies approximately 5 miles of shoreline on Hood Canal (Navy 2018).

1.4 Purpose of and Need for the Proposed Action

The Navy's Proposed Action is to construct a dry dock capable of supporting USS Gerald R. Ford-class aircraft carriers (Ford-class carriers); and modify, construct, demolish, and/or replace other piers, wharves, quay walls, buildings, cranes, and utilities required to execute mission requirements at PSNS & IMF. The purpose and need for the Proposed Action is based on the Navy's mission requirements and the condition of existing facilities, as described in the following subsections.

1.4.1 Mission Requirements

For Navy ships to reach their expected service life, the Navy performs routine depot-level maintenance that requires specialized facilities, equipment and utilities, major repair, overhaul, or complete rebuilding of major systems (propulsion, weapons, and habitability). The Navy refers to scheduled maintenance periods as availabilities, which are performed both pier-side and in a dry dock, depending on the required work. Dry docks are used to accomplish major repairs, maintenance, and modernizations that cannot be performed waterborne. PSNS & IMF maintains six dry docks that service Navy vessels, as shown on Table 1-1. As newer, larger classes of aircraft carriers and submarines enter service, PSNS & IMF would become increasingly constrained in scheduling and performing maintenance using its existing dry docks, since DD1, DD3, and DD6 lack the configuration and capacity to support newer vessels. With limited dry dock and pier capacity, PSNS & IMF planners prepare detailed schedules to prioritize the work in accordance with fleet deployment schedules. Simultaneously, planners must also maintain the agility and capacity to respond quickly to emergent repairs without interfering with scheduled maintenance actions.

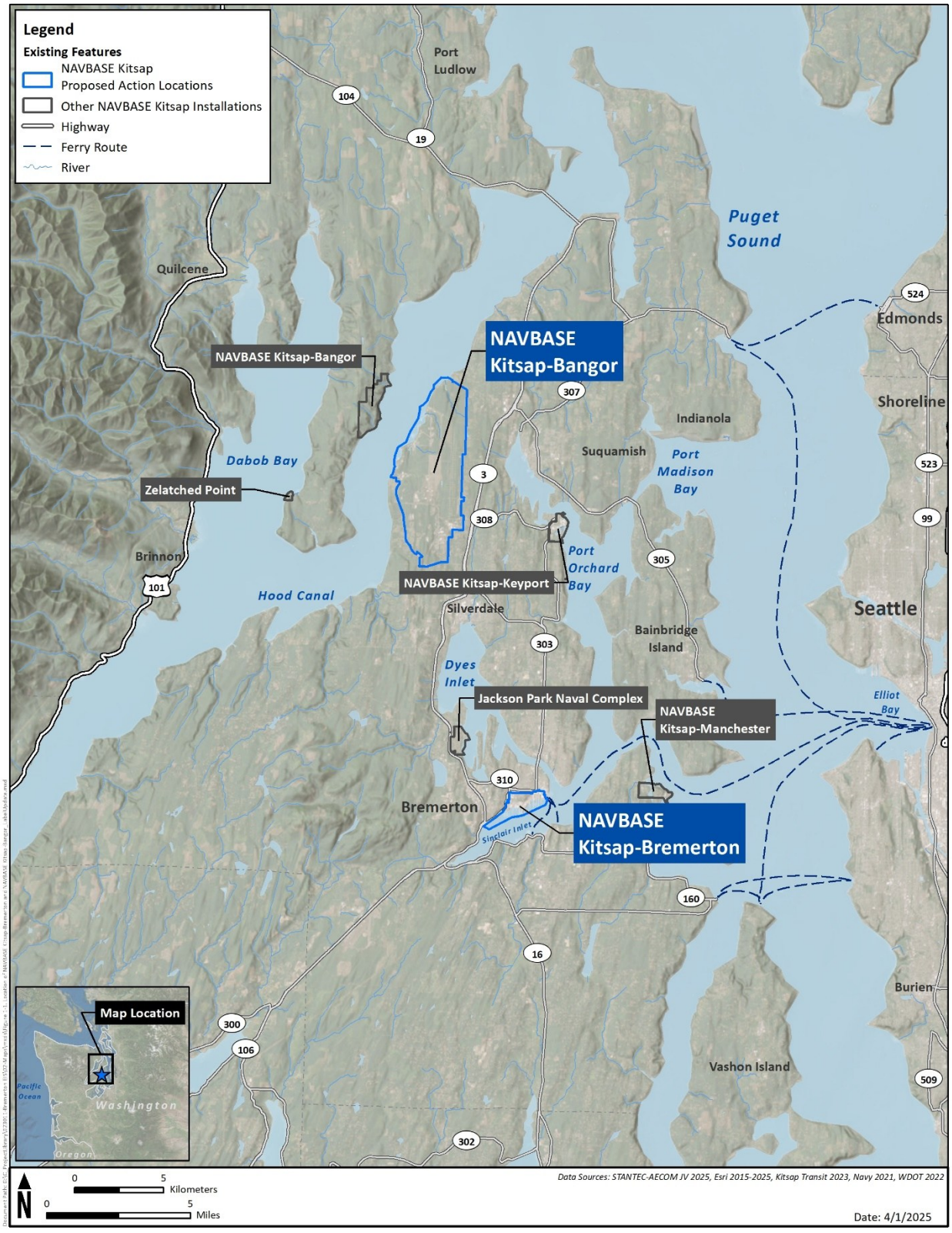

Figure 1-1 Location – NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor

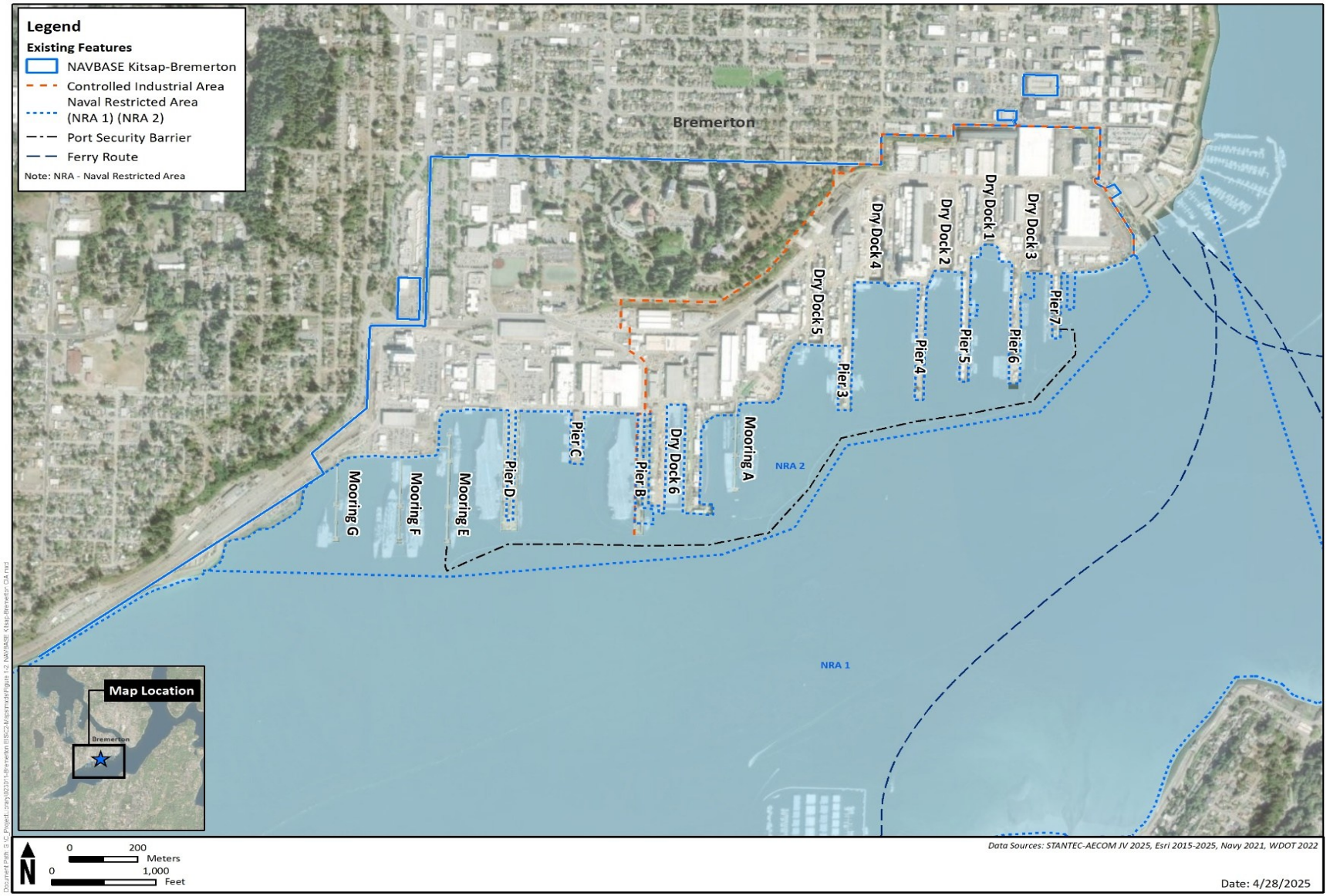

Figure 1-2 NAVBASE Kitsap-Bremerton CIA

Table 1-1 Dry Dock Maintenance Configuration and Capacity by Ship Class

Dry Docks	Submarines					Aircraft Carriers	
	Los Angeles-class	Ohio-class	Seawolf-class	Current Virginia-class	Future Virginia-class	Nimitz-class	Ford-class
Dry Dock 1	Supports	Does not support	Does not support	Does not support	Does not support	Does not support	Does not support
Dry Dock 2	Supports	Supports	Supports	Supports	Supports	Does not support	Does not support
Dry Dock 3	Supports	Does not support	Does not support	Does not support	Does not support	Does not support	Does not support
Dry Dock 4	Supports	Supports	Supports	Supports	Supports	Does not support	Does not support
Dry Dock 5	Supports	Supports	Supports	Supports	Supports	Does not support	Does not support
Dry Dock 6	Supports	Supports	Supports	Supports	Supports	Supports	Does not support

PSNS & IMF also supports the retirement of Naval vessels, which requires many of the same resources as active vessel maintenance. Retirement of nuclear-powered vessels is conducted in three phases: inactivation (decommissioning and removal of spent fuel); long-term waterborne storage; and nuclear reactor compartment disposal (RCD) and recycling. While other U.S. Naval shipyards routinely inactivate nuclear-powered vessels, PSNS & IMF is the only U.S. Naval shipyard that conducts the RCD and recycling process for nuclear-powered submarines. In addition, PSNS & IMF is the only location on the West Coast certified to store inactivated nuclear vessels.

1.4.2 Existing Facilities

PSNS & IMF at NAVBASE Kitsap-Bremerton is over 100 years old, and many of its in-water facilities were designed to build and maintain ships that no longer exist. PSNS & IMF's existing piers and dry docks do not provide the capability and capacity to meet future fleet operational needs. PSNS & IMF's existing infrastructure cannot support docking maintenance and repair of Ford-class carriers. In addition, with the arrival of newer classes of ships and the continued mission of overhauling, refueling, inactivating, and recycling ships, PSNS & IMF lacks sufficient dry dock capacity to execute mission requirements. For example, the Navy anticipates that two of the existing dry docks would be too small to support larger future Navy vessels. Pier capacity requirements are based not only on linear feet of piers, but also on type of pier.

Except for two piers, all the dry docks, piers, and wharves at PSNS & IMF were designed and constructed prior to current understanding of seismic hazards and structural behavior during earthquakes. As a result, these structures do not meet existing seismic performance standards and are expected to perform poorly in seismic events. PSNS & IMF performed seismic studies of DD6 in compliance with MIL-STD 1625D (SH) (Department of Defense [DoD] 2009) and the results revealed that DD6 would not meet DoD's seismic standards without structural modification. A future construction schedule has not been determined. Studies were performed on the remaining dry docks in 2022. The Navy completed some seismic upgrades to DD4 and DD5 in 2023. Of the Navy's existing piers at NAVBASE Kitsap-Bremerton, only Pier B, replaced in 2012, and Pier D, reconstructed in 2000, meet DoD Unified Facilities Criteria (UFC) design standards for seismic performance (DoD 2020).

To meet mission requirements, the Navy maintains numerous upland facilities within the CIA, including large industrial shops and warehouses, smaller ship support facilities, and temporary structures. PSNS & IMF is the only Navy facility on the West Coast that has the highly specialized nuclear-powered aircraft carrier (CVN) proficient workforce, facilities, and equipment necessary to complete CVN maintenance.

1.4.3 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to address critical deficiencies in dry dock capability, capacity, and seismic survivability at NAVBASE Kitsap-Bremerton to enable PSNS & IMF to meet its mission to support the Navy's nuclear fleet. The Proposed Action is needed because:

- PSNS & IMF does not have the dry dock capability to support the Navy's newest Ford-class carriers.
- PSNS & IMF does not have the dry dock and pier capacity to conduct the required future overhauling, refueling, inactivating, and recycling of nuclear-powered ships. PSNS & IMF must also maintain the capacity to perform emergent work such as battle damage repair.
- PSNS & IMF has the only dry dock on the West Coast that can accommodate a nuclear-powered aircraft carrier, and it does not meet seismic criteria under the DoD's safety certification program (MIL-STD-1625D [SH]) (DoD 2009), nor under the DoD UFC (DoD 2017, 2020).

1.5 Regulatory Considerations

The Navy must conduct regulatory consultations with other federal agencies and obtain permits under State and Federal laws to support the construction and operation of proposed facilities. The Proposed Action would require the consultations and permitting processes listed in Table 1-2. Additional details on regulations and consultations are found in Appendix C.

Table 1-2 Anticipated Consultations and Permitting Processes

Federal and State Laws, Statutes, Regulations, and Policies	*Regulatory Agency, Tribe, and/or Stakeholders*
CWA Section 404 and Rivers and Harbors Act Section 10	USACE
CWA Section 401	Ecology
CWA Section 402	EPA
CWA Section 307	Ecology
Coastal Zone Management Act	Ecology
CERCLA	EPA, Ecology, WDNR, Suquamish Tribe
Clean Air Act	Puget Sound Clean Air Agency
ESA Section 7	USFWS, NMFS
Magnuson-Stevens Fishery Conservation and Management Act	NMFS
MMPA	NMFS
NHPA	Washington SHPO, Advisory Council on Historic Preservation, NPS, Suquamish, Skokomish, Port Gamble S'Klallam, Jamestown S'Klallam, and Lower Elwha Klallam Tribes, other interested parties
EO 13175, Consultation and Coordination with Indian Tribal Governments	Suquamish, Skokomish, Port Gamble S'Klallam, Jamestown S'Klallam, and Lower Elwha Klallam Tribes

Federal and State Laws, Statutes, Regulations, and Policies	*Regulatory Agency, Tribe, and/or Stakeholders*
Dredged material suitability determination(s)	DMMO (USACE, Ecology, WDNR, EPA)
Site use authorization for open water disposal of suitable dredged material	WDNR
14 CFR Part 77 – Safe, Efficient use, and Preservation of the Navigable Airspace	Federal Aviation Administration

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CWA = Clean Water Act; DMMO = Dredged Material Management Office; Ecology = Washington State Department of Ecology; EO = Executive Order; EPA = U.S. Environmental Protection Agency; ESA = Endangered Species Act; MMPA = Marine Mammal Protection Act; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; NPS = National Park Service; SHPO = State Historic Preservation Officer; USACE = U.S. Army Corps of Engineers; USFWS = U.S. Fish and Wildlife Service; WDNR = Washington State Department of Natural Resources

1.6 Public Involvement

In accordance with NEPA, the Navy invited public comment on the scope of the EIS through the scoping process, including requesting identification of potential alternatives, information, and analysis relevant to the Proposed Action. The Navy also invited public engagement and comments pursuant to the National Historic Preservation Act (NHPA) Section 106 process beginning with this scoping process. Table 1-3 describes the public engagement efforts during the scoping process.

During the scoping period, which ran from June 8, 2022 to July 11, 2022, 26 submittals were received from the public, tribes, and agencies. Of those 26 submittals, 61 comments were received. The submittals included:

- 6 letters via the project email/website (Washington [WA] State Department of Transportation [WSDOT] Ferries, WA State Department of Ecology [Ecology], EPA, National Park Service [NPS], City of Bremerton, Suquamish Tribe)
- 9 comments received at the virtual public scoping meeting
- 7 comments received from private citizens via the project email/website
- 4 emails from agencies with “No comment at this time” (U.S. Bureau of Reclamation, U.S. Geological Survey, U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration [NOAA])

The Navy considered comments received during the scoping period when preparing the Draft EIS and complying with Section 106 of the NHPA. Scoping comments (Table 1-4) influenced analysis in some resource sections. A Scoping Summary Report is provided in Appendix B.

Table 1-3 Summary of Public Engagement During Scoping

Public Engagement Action	*Date*
Notice of Intent Published in Federal Register.	June 8, 2022
Scoping Period (30 days).	June 8, 2022, to July 11, 2022
EIS Website (https://www.BremertonWaterfrontImprovementsEIS.com).	Launched June 8, 2022; ongoing
Newspaper Advertisements announcing the Notice of Intent to prepare an EIS, scoping period, virtual public scoping meeting and opportunities for public comment.	*Seattle Times* (June 9, 10, and 11, 2022) *Kitsap Sun* (June 9, 10, and 11, 2022)
Newspaper advertisements announcing the virtual public scoping meeting and opportunities for public comment.	*Seattle Times* (June 16, 20, 21, and 22, 2022) *Kitsap Sun* (June 16, 20, 21, and 22, 2022) *North Kitsap Herald* (June 17, 2022) *Port Orchard Independent* (June 17, 2022)
Commander, Navy Region Northwest News Release #22-0608 announcing the intent to prepare an EIS, virtual public scoping meeting and opportunities for public comment.	June 8, 2022
Email notification to Washington State Congressional staffers announcing the intent to prepare an EIS, virtual public scoping meeting, and opportunities for public comment.	June 8, 2022
Posts issued on the following Facebook pages to communicate the virtual public scoping meeting and opportunities for public comment: • Commander, Naval Region Northwest • NAVBASE Kitsap • Puget Sound Naval Shipyard and Intermediate Maintenance Facility	June 8, 2022 June 15, 2022 June 20, 2022 June 23, 2022
A stakeholder letter mailed to 93 recipients (elected officials, potential cooperating agencies, non-government organizations, and any state or federal agency managing a resource that could be impacted by the Proposed Action).	June 8, 2022
Postcards mailed to 62 recipients. Postcards were sent to an interested parties distribution list.	June 8, 2022
Virtual Public Scoping Meeting.	June 23, 2022, from 5:30 to 6:30 p.m. Pacific Time

Legend: EIS = Environmental Impact Statement; NAVBASE = Naval Base

Table 1-4 Scoping Comment Excerpts

Agency/Affiliation	*Comment*
Environmental Protection Agency	<u>Aligning Infrastructure Improvements Project with each CERCLA Operable Unit</u> The project area is located within the Puget Sound Naval Shipyard Complex National Priorities List Superfund (CERCLA) site. In light of these potential impacts to the Superfund cleanup activities, EPA recommends the Draft Environmental Impact Statement: • Include details of the OU B Terrestrial and OU B Marine Superfund cleanup remedies in the "affected environment" section of the DEIS. Identify the contaminants that are the focus of the remediation as well as the remediation targets for each OU affected by the project. • Discuss how the project will affect the cleanup remedy in the "environmental consequences" section of the DEIS. • Including maps in the DEIS that clearly show the affected OUs and the areas and depths of dredging, including any area beyond the OU B Marine boundary in outer Sinclair Inlet.
Environmental Protection Agency	<u>Dredged Sediment Testing and Disposal</u> Because the proposed project involves dredging sediment, including contaminated sediment under piers that have not been previously addressed, EPA recommends the DEIS discuss the options for management and disposal of the dredged material based on the sediment characterization results. If sediment suitability determinations cannot be made, presume that the material to be dredged will not be suitable for all placement options and identify how any toxic or contaminated material that does not meet disposal or placement criteria would be handled.
Environmental Protection Agency	<u>Air Quality</u> EPA recommends the DEIS discuss the ambient air conditions (baseline or existing conditions), the National Ambient Air Quality Standards, and the potential air quality impacts of the project, from both construction and operations, for each fully evaluated alternative. Provide an emissions inventory of criteria pollutants, greenhouse gas emissions, and HAP emissions for all project components. Evaluate increased emission exposures from HAPs and fuel combustion resulting from the project. EPA recommends the DEIS discuss the cancer and noncancer health effects associated with air toxics and diesel particulate matter, identify nearby sensitive receptors, and indicate whether any populations could be impacted by truck emissions. <u>Construction Emissions</u> EPA recommends the DEIS also address potential air quality impacts during the construction period to reduce construction emissions.
Environmental Protection Agency	<u>Pollution Prevention</u> EPA therefore recommends including pollution prevention considerations in the early planning and decision-making processes for the proposed project, and, where appropriate, document those considerations in the DEIS. Include process water collection and treatment as a component of the project. When designing the project's infrastructure, explore designs that capture and treat 100 percent process wash water, if possible. When designing the project's infrastructure, explore designs that minimize or prevent stormwater from contacting industrial areas.

Agency/Affiliation	*Comment*
	Address ongoing sources of pollution in or near the project area to the extent possible. Consider using the construction work associated with the project to advance the work needed to address ongoing issues.
Environmental Protection Agency	<u>Noise</u> EPA recommends that the DEIS evaluate and address potential noise impacts of the proposed project by: • Describing how residents living in the vicinity of the proposed facility would be engaged throughout the planned construction activities and establish procedures for complaints investigation. • Describing a noise monitoring program. • Analyzing the potential increase in noise associated with the project and implement best practices for acoustic shielding (i.e., strategic positioning of non-noise generating equipment) and other noise reduction techniques (e.g., mufflers, enclosures, curtains, insulation, and vegetative barriers, and minimizing engine idling during construction and operation). • Identifying sensitive receptors near the project area and consider noise as a concern.
Environmental Protection Agency	<u>Monitoring</u> As the proposed project has the potential to impact many environmental resources for an extended period, EPA recommends that the project be designed to include a monitoring program to ensure compliance with and efficacy of mitigation measures.
National Park Service (NPS)	The Navy's proposed project involves multiple components including construction, demolition, dredging, and related activities occurring within the NHL and the surrounding Puget Sound Naval Shipyard Historic District. Proposed activities with potential to adversely affect the NHL include: • Demolition of numerous contributing resources to the NHL including Dry Dock #3, the Hammerhead Crane, several upland buildings, and Piers 4, 5, 6, and 7. • Construction of new facilities within the NHL boundary. • Excavation associated with construction of new facilities. • Dredging of submerged areas that are part of the NHL; and • Construction of new facilities immediately adjacent to the NHL that may result in adverse visual effects. The NPS seeks viable ways for the Navy to meet its mandate and minimize harm to the NHL in accordance with 36 CFR Section 800.10. This could include minimizing the number of historic resources demolished and considering rehabilitating historic resources to accommodate project needs as well as other possibilities. <u>Hammerhead Crane</u> The NPS acknowledges the costs of maintaining the Hammerhead Crane and that it is no longer needed for the Navy's mission. Nonetheless, given the crane's importance both as an iconic local historic resource and a nationally significant contributing resource to the NHL, the NPS urges the Navy to consider alternatives for its preservation.
Suquamish Tribe	The proposed project will likely create significant environmental impacts including impacts to sediment and water quality, fish habitat, and nearshore ecological functions. In addition, the project will likely create impacts on tribal treaty fishing rights.
Washington State Department of Transportation, Ferries Division	Construction phasing and staging – Washington State Ferries operates a ferry route at the mouth of Sinclair Inlet, where vessel activity will increase to accommodate barging and work boat activity for channel dredging and construction of the Bremerton Waterfront Infrastructure Improvements project for more than a decade.

Agency/Affiliation	*Comment*
	At times, there will likely be construction-related traffic along State Route 304 leading to the Bremerton terminal. In both cases coordination with Washington State Ferries is essential that our respective sailing schedules can maintain operations without conflict to construction scheduling or compromise to customer reliance upon ferry service.
State of Washington Department of Ecology	Greenhouse Gas Emissions and Analysis The state of Washington and its agencies are working to eliminate GHG emissions in all sectors consistent with RCW 70A.45.020, which establishes greenhouse gas limits and requires the state to reduce emission levels in order to meet those limits. The scope of this EIS should include an analysis of all GHG emissions occurring during the construction phase and on-going operations.
State of Washington Department of Ecology	Sediment Characterization and Transport As part of the multi-agency DMMP, Ecology is reviewing the Sediment and Analysis Plan submitted on June 27, 2022, for a preliminary Suitability Determination to aid in project design. The Navy has completed a Sediment Transport Study (Appendix H). The EIS should address effects on longshore drift that would result from each alternative.
State of Washington Department of Ecology	Water Quality Any potential impacts to waters of the state should be addressed in this section, including wetlands and streams, creeks, and ditches in the upland areas of the project. A Water Quality Monitoring and Protection Plan will need to be developed and submitted to Ecology as part of the Navy's Water Quality Certification Request to address any in-water activity. Additionally, not only should construction-related impacts be addressed in the EIS, but also potential operational impacts related to stormwater and spills. Finally, in-water work related to mitigation activities also should be considered. The EIS should evaluate impacts to saline concentration of process wastewater to sanitary sewer from improved infrastructure as well as opportunities to reduce high saline inputs and reduce spikes of high saline wastewaters.
City of Bremerton	Transportation Currently, approximately 60 percent of all in-bound vehicle traffic into Bremerton during the peak period is from Navy employees going to work, and there are approximately 10,100 in-bound pedestrian trips into NAVBASE Kitsap-Bremerton through the various gates as identified in the figures below. The high level of pedestrian trips results from a lack of on-installation parking, which has been identified as between 2,500 and 3,500 needed parking spaces. As a result, workers park throughout the City, both legally in pay lots downtown as well as on-street in residential neighborhoods, with much of this parking in violation of City parking laws. With this current status defined, please ensure the following topics are included in the EIS scope: • Please evaluate traffic and parking impacts resulting from all alternatives being considered, and also identify whether a new carrier would be homeported in Bremerton, how that will affect traffic and parking, and how the Navy proposes to mitigate the impacts. • Identify any off-installation sites and staging areas that would be used during construction and evaluate any impacts associated with or resulting from that use. • How much of the workforce will shift entry locations into the shipyard with either alternative and quantify the new number of pedestrian trips at each gate.

Agency/Affiliation	*Comment*
City of Bremerton	<u>Utilities</u> Please ensure the EIS Scope addresses the following topics: • An evaluation of the long-term and short-term construction impacts to the City's Water, Wastewater and Stormwater utilities, and also third-party utilities including Puget Sound Energy, Cascade Natural Gas, etc. • There is significant existing saltwater inflow and infiltration conveyed into the City's wastewater collection system due to defects in the Navy's wastewater collection system. Please identify how the Navy will investigate and monitor its wastewater collection system and correct the sources of inflow and infiltration. • Drydock dewatering operations introduce saltwater into the City's wastewater collection and treatment systems and have a direct impact on those systems. Please identify whether construction of either alternative will increase or decrease this inflow to the City and how the Navy will mitigate impacts. • The Puget Sound Nutrient General Permit limits the TIN discharge from the City's wastewater treatment plant. Please identify whether construction of either of the alternatives, including any future increase in home porting resulting from the improvements, will increase TIN discharge from the Navy to the City. Identify how the Navy will mitigate any increase in TIN loading. • Identify whether either of the proposed alternatives will increase sewer strength or volume, and if so, how the Navy will mitigate that increase. Also identify whether the Navy proposes to increase any stormwater, dewatering water, or other source of inflow into the City's wastewater collection system during construction.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; DEIS = Draft Environmental Impact Statement; DMMP = Dredged Material Management Program; Ecology = Washington State Department of Ecology; EPA = U.S. Environmental Protection Agency; GHG = greenhouse gas; HAP = hazardous air pollutant; NAVBASE = Naval Base; NHL = National Historic Landmark; NPS = National Park Service; OU = Operable Unit; RCW = Revised Code of Washington; TIN = total inorganic nitrogen

REFERENCES

DoD. (2009, August 27). Standard Practice Safety Certification Program for Drydocking Facilities and Shipbuilding Ways for U.S. Navy Ships.

DoD. (2017). Unified Facilities Criteria 4-152-01 Design: Piers and Wharves. 24 January 2017.

DoD. (2020). Unified Facilities Criteria 4-213-10, Graving Dry Docks. 18 May 2020.

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2 Proposed Action and Alternatives

2.1 Proposed Action

To meet the purpose and need described in Section 1.4, the Navy's Proposed Action is to improve waterfront infrastructure by establishing a new M2D2 at PSNS & IMF; and to modify, construct, demolish, and/or replace other piers, wharves, quay walls, buildings, cranes, and utilities to make space for the new M2D2. The majority of the Proposed Action would occur at NAVBASE Kitsap-Bremerton; however, a forge shop and expanded mission support area (Radio Hill complex) are being considered for NAVBASE Kitsap-Bangor.

2.2 Alternatives Screening Process

NEPA requires federal agencies to include a detailed statement on a reasonable range of alternatives to the proposed agency action that are technically and economically feasible and meet the purpose and need of the proposal. Under the CWA Section 404 (b)(1) Guidelines, the USACE, a Cooperating Agency for this EIS, is also required to evaluate alternatives to a proposed project. Under the Section 404 (b)(1) Guidelines, a practicable alternative is defined as an alternative that is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose.

After compiling a list of potential project alternatives, the Navy conducted an initial analysis that included developing criteria to screen out alternatives that would clearly not be reasonable, practicable, or able to achieve the overall project purpose. Potential alternatives were evaluated against the following screening factors:

- Size: Would the dry dock be adequately sized to support Ford-class carrier maintenance per DoD UFC 4-213-10, Graving Dry Docks?
- Location: Would the dry dock location have reasonable access to an available and proficient CVN maintenance workforce and associated CVN maintenance facilities, equipment, and utilities?
- Mission: Could construction be sequenced to avoid unacceptable impacts to achieving mission requirements?
- Practicable: Would the alternative utilize proven designs, materials, and construction techniques?

2.2.1 Alternatives Considered

The Navy considered numerous alternatives to meet the purpose and need, such as alternative sites and/or Navy locations for a new M2D2, acquisition of a floating dry dock, and upgrading DD6 without building a new M2D2. The Navy only considered M2D2 designs that were large enough to accommodate the Navy's newest class of nuclear-powered aircraft carriers (Ford-class). The Navy did not consider alternatives to modernize or replace DD2 or DD4. As noted in Table 1-1, these dry docks are sufficiently sized to perform maintenance and inactivation on current and anticipated future classes of Naval submarines and are vital to support the foreseeable workload without major modification. Potential alternatives considered and results of the screening analysis are summarized in Table 2-1. Appendix D provides more detailed information on the screening analysis and justification for options considered but not carried forward for detailed analysis in this EIS.

Table 2-1 Alternatives Considered

Alternative	*Description*	*Met all Criteria?*	*Criteria Not Met*
M2D2 at DD3 (Alternative 2, the Preferred Alternative)	• Build M2D2 at location of existing DD3, including Wharf 6 on west wall and Wharf 7 on east wall • Build new Pier 2 • Demolish Piers 4, 6, and 7, the Hammerhead Crane on Pier 6, and upland buildings • Remove select pile foundations from former Pier 8 • Build new Pier 4 • Construct new shipfitter-welder shop and new shipyard support building • Dredge for adequate draft at wharves and piers, and as required for construction of new structures • Forge shop construction at NAVBASE Kitsap Bangor • Radio Hill complex expansion at NAVBASE Kitsap Bangor	Yes	Met all criteria.
M2D2 at Mooring A (Alternative 3)	• Build M2D2 at location of existing Mooring A • Demolish Pier 4, Mooring A • Deconstruct, and remove the Hammerhead Crane on Pier 6 • Build new Pier 4 • Dredge to create a new turning basin, and as required for construction of new structures • Moorings E, F, and G modifications and relocation of existing stored inactivated ships from Mooring A • Radio Hill complex expansion at NAVBASE Kitsap Bangor	Yes	Met all criteria.
Alternatives Considered But Not Carried Forward			
M2D2 at DD1	• Build M2D2 at location of existing DD1 • Build new Pier 2 • Demolish Piers 4, 5, and 6, including the Hammerhead Crane on Pier 6 • Build new Piers 4 and 5 • Seismically upgrade Pier 7 • Dredge to create a turning basin, adequate draft at wharves and piers, and as required for construction of new structures	No	Mission: This alternative would unacceptably impact the Navy's ability to maintain operations at DD2 and DD3 both during and after construction.

Alternative	*Description*	*Met all Criteria?*	*Criteria Not Met*
M2D2 at DD5	• Build M2D2 at location of existing DD5 • Build new pier along the east outside wall of the new dry dock • Demolish Piers 4 and Mooring A • Deconstruct, and remove the Hammerhead Crane on Pier 6 • Build new Pier 4 • Seismically upgrade Pier 6 • Dredge to create a turning basin, adequate draft at wharves and piers, and as required for construction of new structures	No	Mission: Construction of this alternative would unacceptably impact the shipyard's ability to maintain active submarines.
Upgrade DD6 to support USS Gerald R. Ford-class CVNs, no new M2D2.	• Expand and complete seismic upgrades of DD6 • Incrementally upgrade existing dry dock while continuing to use it for CVN repair and maintenance	No	Mission: This alternative would have unacceptable impacts to achieving mission requirements during construction.
M2D2 West of Pier D	• Build M2D2 west of Pier D • Establish new CIA around the new dry dock • Demolish Pier 4 and Moorings A, E, and F • Deconstruct, and remove the Hammerhead Crane on Pier 6 • Build new Pier 4 • Seismically upgrade Pier 6 • Dredge to create a turning basin, adequate draft at wharves and piers, and as required for construction of new structures	No	Location: The two ends of the shipyard are over 1 mile apart, which would create significant challenges for movement of vehicles, people, and material. Expansion of the CIA would adversely impact access to, and mission performance of numerous tenant organizations.

Alternative	*Description*	*Met all Criteria?*	*Criteria Not Met*
Floating Dry Dock	• Acquire new CVN-capable floating dry dock • Demolish Pier B and Mooring A • Build new pier to dock floating dry dock • Dredge to create a sinking basin, adequate draft at wharves and piers, and as required for construction of new structures	No	Practicable: The Navy does not currently possess any floating dry docks that could support an aircraft carrier. Acquiring a floating dry dock of this scope and scale would include significant technical, operational, and cost risks.
M2D2 at NAVBASE Coronado, San Diego, California	• Build M2D2 at NAVBASE Coronado, San Diego, California • M2D2 would be operated by PSNS & IMF workforce temporarily assigned to NAVBASE Coronado • Seismically upgrade DD6 at PSNS & IMF • Upgrade utility distribution systems at NAVBASE Coronado • Relocate displaced buildings and functions at NAVBASE Coronado	No	Location: NAVBASE Coronado does not have a nuclear-capable CVN-proficient workforce, facilities, and equipment.
M2D2 at Naval Station Pearl Harbor, Hawai'i	• Upgrade DD4 at Naval Station Pearl Harbor to support Ford-class carriers • M2D2 would be operated by PSNS & IMF workforce temporarily assigned to Naval Station Pearl Harbor • Seismically upgrade DD6 at PSNS & IMF • Upgrade Naval Station Pearl Harbor DD4 and supporting utility systems • Relocate displaced buildings and functions at Naval Station Pearl Harbor	No	Location: Naval Station Pearl Harbor does not have a nuclear-capable CVN-proficient workforce, facilities, and equipment.

Legend: CIA = Controlled Industrial Area; CVN = aircraft carrier; DD = dry dock; M2D2 = multi-mission dry dock; NAVBASE = Naval Base; PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility

2.3 Alternatives Carried Forward for Analysis

This EIS evaluates the no-action alternative and two action alternatives. The Navy is considering two alternative locations for the proposed M2D2: DD3 and Mooring A. . The Proposed Action also includes dredging to create adequate water depth at wharves and piers that would be required to operate the new M2D2 and new piers/wharves constructed under either action alternative. Since the PSNS & IMF waterfront is densely developed and contains no undeveloped land, each action alternative would require some degree of demolition, construction, upgrade or replacement of in-water structures and the demolition, construction, or modification of upland facilities. Each action alternative includes construction of new piers and/or wharves to provide pier capacity to conduct the required future overhauling, refueling, inactivating, and recycling of nuclear-powered ships. Table 2-2 presents a comparison of the components of each of these alternatives, which are further described in Sections 2.3.1 through 2.3.3. Additionally, the Navy would implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under the CWA Section 404 (see Appendix F, *Compensatory Mitigation*).

Table 2-2 Comparison of Alternatives Carried Forward

Component	*Alternative 1 No-Action Alternative*	*Alternative 2 (Preferred Alternative) M2D2 at DD3*	*Alternative 3 M2D2 at Mooring A*
M2D2 location	No M2D2 constructed	DD3	Mooring A
M2D2 Wharf	No M2D2 constructed	New Wharf 7 at M2D2 east wall New Wharf 6 at M2D2 west wall	New CVN repair Wharf 2 at M2D2 east wall
Temporary Construction Methods	No construction	• 18 temporary mooring buoys • Off-site contractor multi-use site(s) • Temporary cofferdam • Temporary construction access pier	• 18 temporary mooring buoys • Off-site contractor multi-use site(s) • Temporary construction access pier
Moorings E, F, and G	No change	No change	Modify mooring structures before relocation of existing stored inactivated ships from Mooring A
Forge Shop	No change	Construct new forge shop at NAVBASE Kitsap-Bangor	No change
Parking garage at NAVBASE Kitsap-Bremerton	No new parking garage	No new parking garage	Construct new parking garage
Pier 2	No new Pier 2	Construct new Pier 2	No new Pier 2
Pier 4	No change	Demolish and replace	Demolish and replace
Hammerhead Crane	No change	Deconstruct and remove	Deconstruct and remove
Pier 6	No change	Demolish and construct new Wharf 6 at M2D2 west wall	No change
Pier 7	No change	Demolish and construct new Wharf 7 at M2D2 east wall	No change
Former Pier 8	No change	Remove select pile foundations	No change
Mooring A	No change	No change	Demolish

Component	*Alternative 1 No-Action Alternative*	*Alternative 2 (Preferred Alternative) M2D2 at DD3*	*Alternative 3 M2D2 at Mooring A*
Dredging	No dredging	Dredge for adequate draft at wharves and piers, and as required for construction of new structures	Dredge to create a new turning basin, and as required for construction of new structures
Building Demolition and Replacement/ Construction	No change	Building demolition and replacement (Table 2-4)	Building demolition and replacement (Table 2-7)
Radio Hill complex at NAVBASE Kitsap-Bangor	No change	Expand Radio Hill complex	Expand Radio Hill complex
Vessel Traffic			
One Way Transits	***Alternative 1 No-Action Alternative***	***Alternative 2 (Preferred Alternative) M2D2 at DD3 Typical One-Way Trips per Day***	***Alternative 3 M2D2 at Moring A Typical One-Way Trips per Day***
Dredged material disposal trips to and from Elliott Bay	No change	0-2 barges (construction years 1-6)	2 barges (construction years 1, 2, and 10)
Dredged, excavated and demolition materials to contractor multi-use site(s) at Port of Seattle and/or Port of Tacoma	No change	0-3 barges (construction years 1-7)	2 barges (construction years 1, 2, and 10)
Construction materials from contractor multi-use site(s) to Bremerton	No change	3 barges (all years)	Same as Alternative 2
Movement of vessels within Sinclair Inlet	No change	0-4 trips (all years)	Same as Alternative 2
Worker foot ferry and crew boat trips	No change	8 trips (all years)	Same as Alternative 2
Caisson Delivery	No change	2 Trips[1]	2 Trips[1]

Notes: [1] – Two trips to deliver a caisson from Norfolk, VA to Bremerton, WA with each trip being separated by months or years.
Legend: CVN = aircraft carrier; DD = dry dock; M2D2 = multi-mission dry dock; NAVBASE = Naval Base

As described in Section 1.4, the Proposed Action is needed because PSNS & IMF does not have the dry dock and pier capacity to meet future mission requirements. While the primary project analyzed is a proposed new M2D2, some waterfront facilities (unaffected by the M2D2 alternatives) must be replaced in their original locations to meet future mission requirements.

For some elements of the Proposed Action, the Navy has proposed no alternative action or location. The Navy determined that constructing a new carrier dock and replacing DD6 capacity at a different location was not practicable due to space constraints at the densely-developed waterfront and the significantly increased potential environmental impacts that would be required to develop a new dry dock in a new location within Sinclair Inlet.

Similarly, both action alternatives include demolishing and rebuilding Pier 4 (originally built over 100 years ago) in its current location. No alternative locations are proposed due to the limited waterfront space and increased potential environmental impacts of building it in another location.

There are also no reasonable alternatives to deconstructing the Hammerhead Crane. The Hammerhead Crane was built in 1933 to support work on large battleship gun turrets—a mission that ceased at NAVBASE Kitsap-Bremerton many years ago. The crane is obsolete and cannot be certified for other uses. Additionally, replacement parts are unavailable, it lacks modern safety features, and it does not meet current seismic standards. Furthermore, the Navy needs that space for mission-related activities while also reducing safety risks to current operations. In addition, the crane has degraded after a quarter century of non-use, and it would be very costly for the Navy to continue to maintain it in a safe condition. Therefore, both of the Navy's action alternatives include removal of the crane.

Although there are no reasonable alternatives for some components of the Proposed Action, the Navy is considering different design features, construction methods, and best management practices (BMPs) that could reduce the environmental impacts associated with these components, as further described in the resource chapters of this EIS.

Selection of the Preferred Alternative

Both Alternative 2 and Alternative 3 meet the Navy's mission requirements. The Navy identified Alternative 2 as the preferred alternative because it would have fewer environmental impacts than Alternative 3, based on a comparison of dredge areas, in-water fill, and net increase in overwater coverage.

2.3.1 Alternative 1: No-Action Alternative

Under Alternative 1, the Proposed Action would not occur. The proposed M2D2 would not be built, Pier 4 would not be replaced, and other component actions would not occur. The Navy would continue to maintain, repair, and operate existing facilities, but two dry docks would become obsolete, and PSNS & IMF would have decreased capability and capacity to support the future mission capability.

The no-action alternative would not meet the purpose of or need for the Proposed Action. However, NEPA documents are required to evaluate the no-action alternative. The no-action alternative serves to establish a comparative baseline for analysis of the action alternatives.

2.3.2 Alternative 2: Multi-Mission Dry Dock at Dry Dock 3 (Preferred Alternative)

Under Alternative 2, the Navy would construct and operate a new M2D2 at the location of existing DD3. The Navy would demolish Piers 4, 6, and 7, and deconstruct, and remove the Hammerhead Crane on Pier 6. To ensure adequate pier capacity to accomplish mission requirements, the Navy would construct a new Pier 2 and replace Pier 4. The Navy would demolish and replace the existing storage facility with a shipyard support building. The Navy would demolish and replace the shipfitter-welder shop. The Navy would also dredge to create adequate draft at wharves and piers.

At NAVBASE Kitsap-Bangor, a new forge shop would be constructed and an existing mission support area (Radio Hill complex) would be expanded. A comparison of new and existing structures is provided in Table 2-3. Components of Alternative 2 are shown in Figure 2-1.

Table 2-3 Alternative 2 (Preferred Alternative) Comparison of Existing and New Structures

Component Or Action	*Existing Structure*			*New Structure*		
	Type	*Location*	*Year Completed*	*Proposed Construction Type*	*Location*	*Estimated Construction Start Year*
DRY DOCKS						
M2D2 at DD3 Demolish and replace	DD3, pressure-relieved dry dock	NAVBASE Kitsap-Bremerton	1919	Demolish DD3 and build new pressure-relieved dry dock	NAVBASE Kitsap-Bremerton	2028
PIERS, WHARVES, MOORINGS						
Pier 2 Construct new pier	N/A	NAVBASE Kitsap-Bremerton	N/A	Build new pier	NAVBASE Kitsap-Bremerton	2027
Pier 4 Demolish and replace	Pier 4, repair pier	NAVBASE Kitsap-Bremerton	1914	Demolish Pier 4 and build new pier	NAVBASE Kitsap-Bremerton	2036
Pier 6 Demolish	Pier 6, repair pier	NAVBASE Kitsap-Bremerton	1926	Replace with Wharf 6 on M2D2 west wall	NAVBASE Kitsap-Bremerton	2028
Pier 7 Demolish	Pier 7, repair pier	NAVBASE Kitsap-Bremerton	1943	Replace with Wharf 7 on M2D2 east wall	NAVBASE Kitsap-Bremerton	2028
Former Pier 8 Remove select pile foundations	Former pier	NAVBASE Kitsap-Bremerton	N/A	Remove select pile foundations	NAVBASE Kitsap-Bremerton	2031
OTHER						
Hammerhead Crane Deconstruct, and remove	Crane	NAVBASE Kitsap-Bremerton	1933	Hammerhead Crane would not be replaced	NAVBASE Kitsap-Bremerton	2028
Forge shop Demolish and replace	Forge shop at PSNS & IMF	NAVBASE Kitsap-Bremerton	1938-1942	Construct new building at NAVBASE Kitsap-Bangor	NAVBASE Kitsap-Bangor	2027
Radio Hill complex expansion	Existing gravel area	NAVBASE Kitsap-Bangor	N/A	Pave existing gravel area and construct new paved area. Construct two new buildings with employee parking areas: employee building and work building.	NAVBASE Kitsap-Bangor	2027

Component Or Action	*Existing Structure*			*New Structure*		
	Type	*Location*	*Year Completed*	*Proposed Construction Type*	*Location*	*Estimated Construction Start Year*
Upland Facilities Demolish and replace	Permanent buildings and utility facilities, trailers, modular units, sheds, and enclosures	NAVBASE Kitsap-Bremerton	Various	Demolish approximately 30 permanent buildings and utility facilities (Table 2-4); Demolish or relocate 50+ trailers, modular units, sheds, and enclosures. Demolish and replace storage facility with a larger shipyard support building to accommodate functions displaced by the construction of M2D2 at DD3. Demolish and replace the shipfitter-welder shop. In addition, the Navy would modify Streets E, F, and H.	NAVBASE Kitsap-Bremerton	to be determined

Legend: ~ = approximately; CVN = aircraft carrier; DD = dry dock; M2D2 = multi-mission dry dock; N/A = not applicable; NAVBASE = Naval Base; PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility

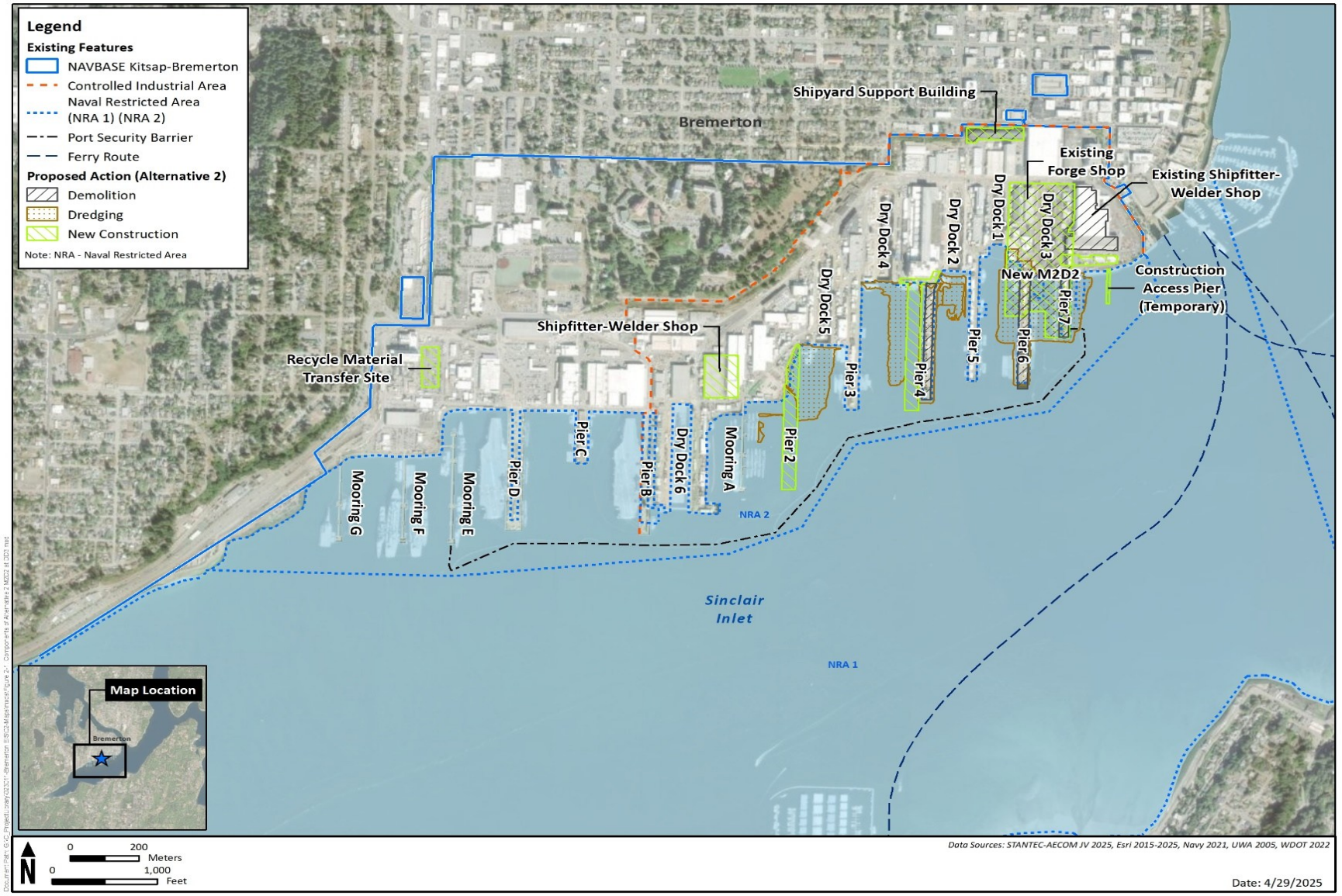


Figure 2-1 Components of Alternative 2: M2D2 at DD3

Operation under Alternative 2 would generally follow the same shipyard procedures for scheduling and completing maintenance and decommissioning. Operational shipyard workforce would not significantly change after construction of Alternative 2 is complete. Under Alternative 2, some workforce would shift to new facilities at NAVBASE Kitsap-Bangor.

2.3.2.1 Multi-Mission Dry Dock at Dry Dock 3 Construction Details

Under Alternative 2, the Navy would demolish the existing DD3, Pier 6, Pier 7, and other upland structures and a new M2D2 would be built in the DD3 location. Existing DD3 lacks sufficient depth to effectively facilitate docking active nuclear vessels currently in use by the Navy. Existing DD3, a pressure-relieved dry dock, was built in 1919. New facilities would be constructed to replace demolished facilities and to support the new M2D2. Table 2-4 provides a summary of facilities impacted by construction of the M2D2 for Alternative 2.

Table 2-4 Facilities Impacted by M2D2 Construction for Alternative 2 (Preferred Alternative)

Proposed Change	*Facility*
Demolish	In-water and over-water: DD3 Hammerhead Crane on Pier 6 Pier 4 Pier 6 Pier 7 Upland: Asphalt and concrete paving Canteen Electric Substations (6) Enclosures (4) Forge shop Hazardous Waste Storage Facility Lead Storage Facility Office trailers and modular units (57) Oily Waste Treatment Facility Paint Shop (2) Pumpwell Relocatable buildings and sheds (10) Saltwater Pump Building Security Building Ship Services Support Buildings (2) Shipping containers (8) Shower and restroom trailers (5) Storage Facility Utility Building Waterfront Storage Building Waterfront Support Facilities (8)
Modify	Existing Streets

Proposed Change	*Facility*
New Construction	M2D2, including new Wharf 6 at M2D2 west wall and new Wharf 7 at M2D2 east wall Pier 2 and demolish/replace Pier 4 Dewatering Pumphouse Saltwater Pumphouse Electrical Substations (2) Utility Buildings (2) Restroom Facility Asphalt and concrete paving Shipfitter-welder shop Forge shop at NAVBASE Kitsap-Bangor Shipyard support building Radio Hill complex expansion at NAVBASE Kitsap-Bangor

Legend: DD = dry dock; M2D2 = multi-mission dry dock

The new M2D2 would be a concrete pressure-relieved dry dock with a system of drains and dewatering pumps that would reduce hydrostatic forces (water pressure) on the structure's exterior surfaces. The coping (top edge) height would account for future sea level rise. The Defense Regional Sea Level database shows a range of projections for sea level rise. The project designs are based on the medium scenario for 2100, sea level rise of 3.3 feet.

Site preparation for M2D2 construction would include:

- Installation of temporary exclusion fences and construction laydown areas.
- Temporary relocation of the floating Port Security Barrier (PSB). Temporary relocation will not increase the acreage within the PSB.
- Installation of additional upland saltwater pumps.
- Operation of a temporary barge-mounted saltwater pump system prior to completion of new saltwater pumps.
- Removal of existing missions and activities from the construction area, including relocation of the RCD and recycling hub, RCD barge storage, and all operations in buildings to be demolished.
- Demolition of existing in-water, aboveground and underground facilities, structures, and utilities within the M2D2 footprint, including DD3, Piers 6 and 7, and removal of select pile foundations from former Pier 8.
- Facilitate access to the work site for materials and workers. Navy is evaluating the following options: 1) construct a temporary pile-supported multi-use fixed access pier east of pier 7; approximately 100 feet wide by 300 feet long; 2) maintain existing Pier 6 for as long as feasible to provide construction access; 3) develop laydown area at an existing PSNS & IMF western parking lot; 4) provide vehicle access through the Bremerton Gate; 5) develop an access road from Bremerton Gate to construction site; and 6) Installation of temporary mooring buoys for construction barges during the years of construction (see Section 2.4.1.4 for further details).

Construction and demolition materials, equipment, and construction workers would be transported to the work site via ferry, crew boat, skiff, barge, tug, scow, and roadway network. Shoring walls will be installed in the ground upland of the dry dock footprint to retain soil and cut off groundwater flow into the construction site. Permanent in-water cofferdams would be installed along the east and west sides of the proposed dry dock footprint and a temporary cofferdam would be installed along the south side.

Pipe piles and sheet piles would be installed to create cofferdam structures. The east side permanent cofferdam would require demolition of Pier 7 prior to installation. The southern temporary cofferdam would require demolition of a portion of Pier 6 prior to installation. Once an area is closed off (isolated) from Sinclair Inlet, construction activities within the enclosed area could continue year-round (i.e., outside the in-water work window), except for in-water impact pile driving. In-water impact and vibratory pile driving would only be conducted during the in-water work window, unless installation occurs in the dry or dewatered condition. Once an area is closed off and sealed, the site would be dewatered to allow further excavation of soil to allow the dry dock to be built in the dry.

Other activities to be conducted during the in-water work window include the demolition of Piers 6 and 7, removal of select Pier 8 pile foundations, dredging, deconstruction of temporary cofferdams, placement of ballast rock and tremie concrete, and construction of new pile-supported structures. Dredged materials, excavated materials, and construction debris would be processed and disposed of in accordance with federal, state, and local regulations. Prior to completing construction, the Navy would remove the temporary CIA fence, temporary pier, temporary moorings, and Bremerton Gate access road. The Navy would modify some PSB buoys and anchors in the vicinity of the new M2D2. The PSB would not extend farther south than the current PSB alignment and the area within the PSB will not increase. Construction activities may require up to two concrete batch plants, one on-land and one barge-based plant.

M2D2 features would include: a new Wharf 6 at the west wall, new Wharf 7 at the east wall, removable caisson (floating steel door with sealable tubes to allow flooding of the dry dock), enclosed stairs, enclosed utility galleries, electrical and mechanical utility tunnels, floor drains, drainage tunnels, discharge tunnels, saltwater system intakes, a saltwater cooling and distribution system, flooding and dewatering systems, process water collection, treatment, and discharge system, passenger and freight elevators, vessel mooring hardware, bollards, capstans, perimeter safety railing, temporary services support hangers, area lighting, and anti-terrorism features. The new facility would include the following systems: fire protection, information technology, automated controls process water collection, and process water/oily waste treatment. Crane tracks would be installed on the deck around M2D2 for the weight handling system required to operate M2D2. Based on low sedimentation rates in Sinclair Inlet and experience with its current dry docks, the Navy does not anticipate the need for any maintenance dredging once M2D2 is complete. Once constructed, M2D2 operation and function are expected to remain largely the same as current dry docks, with the added ability to support USS Gerald R. Ford-class (Ford-class) aircraft carriers.

2.3.2.2 Installation of Dry Dock Caisson

M2D2 would be equipped with a caisson at its entrance. The caisson would be a large floating steel gate structure that when placed provides a watertight seal, allowing the dry dock to be emptied for vessel repair or flooded with seawater to allow vessels to enter and leave the dry dock. Flooding of the drydock would be done using flood-through tubes within the caisson.

2.3.2.3 Flooding and Dewatering System

Flooding of the new M2D2 would be done using flood-through tubes within the caisson. After flooding, the caisson would be floated out of the dry dock's caisson seat. Once the caisson is moved south of the caisson seat, the bubble screen would be activated, and the caisson would be towed to a nearby pier for moorage until caisson reinstallation. Once the caisson is removed, the dry dock opens to the outside, surrounding aquatic environment. The bubble screen, while activated, would deter fish from entering

inside the flooded dry dock. The bubble screen is produced when air is forced through plastic or metal piping fashioned in a U-shape down the walls and across the floor of the dry dock. Small holes in the pipe placed approximately 2 inches apart create a wall of bubbles. The bubble screen is shut off during the time a vessel crosses to prevent induction of air bubbles into the vessel's cooling water intakes.

After vessels move in or out of the dry dock, the caisson would be replaced, and the water is pumped out. Per UFC requirements, this process takes up to 4 hours to complete. Pumps drain the water through grated tunnels in the dry dock floor. Individual pumps discharge into the open top of a 14-foot-wide culvert partially submerged in Sinclair Inlet. During peak periods of juvenile salmon migration, the Navy minimizes the time for the caisson to be removed from the flooded dry dock to reduce salmonids entering the dry dock.

The Navy sweeps, washes, and inspects dry docks prior to flooding in accordance with best management practices (BMPs) required by the Shipyard's National Pollutant Discharge Elimination System (NPDES) permit, the National Marine Fisheries Service Biological Opinion, and Navy BMPs (see Section 2.6). PSNS & IMF dry docks use a process water collection system to minimize contaminants entering Sinclair Inlet.

2.3.2.4 Saltwater Cooling and Distribution System

When Navy vessels are in dry dock, the Shipyard uses a saltwater distribution system to enable shipboard firefighting systems and provide non-contact cooling for other ships systems. The system also provides saltwater to piers for firefighting support. To construct M2D2, the Navy would demolish the existing saltwater pump house and saltwater intake structure located west of DD3 and construct a new system east of M2D2. The current saltwater system serves DD1, DD2, DD3, DD4, DD5, and Piers 3, 5, 6, and 7. To maintain shipyard operations during construction, the Navy would operate a temporary barge-mounted saltwater intake system until the new M2D2 saltwater system is operational.

The temporary barge-mounted saltwater intake and pump system would connect to the existing saltwater system, providing saltwater to DD1, DD2, DD4, DD5, and Piers 3 and 5. The barge-mounted intake system would be moored at an existing Shipyard pier. The Navy would design the barge-mounted saltwater intake system to meet Best Technology Available (BTA), as defined in CWA Section 316(b) (40 CFR 125 Subpart J), which regulates cooling water intake structures. The system would be designed to minimize impacts to marine organisms, including juvenile salmonids involuntarily drawn into the system (entrainment) or stuck to the intake screens (impingement). Design considerations would include suspending intake screens below the barge at a depth to minimize entrainment, reducing screen mesh size, and maintaining low saltwater intake velocity. Since Sinclair Inlet supports fish species listed under the Endangered Species Act (ESA), NMFS would review the intake system design and related site-specific conditions. Saltwater withdrawn from Sinclair Inlet by the temporary intake system and used as cooling water for vessels in dry docks would be discharged to Sinclair Inlet through existing Shipyard Outfall 18. The intake design and effluent quality and quantity would comply with the Shipyard's NPDES permit from EPA.

The permanent M2D2 saltwater system would include a new saltwater pump house east of M2D2 and a new saltwater intake structure on the shoreline east of M2D2. The Navy would design the new saltwater intakes to meet BTA as described above. NMFS would review and validate the design during ESA consultation to validate adequate reduction of entrainment and impingement of marine organisms. The intake structure design, maintenance, and monitoring requirements would be included in the Shipyard's NPDES permit. The final design may include additional features such as intermittent recirculation of

cooling water to further minimize impacts to marine organisms. The saltwater cooling effluent from DD1, DD2, DD4, and DD5 would continue to discharge from existing Shipyard Outfall 18. Saltwater cooling effluent from M2D2 would discharge to Sinclair Inlet via a new outfall extending from the shoreline east of M2D2. The outfall would end with a diffuser, a large pipe set on the seafloor that would contain numerous holes/ports to allow controlled discharge of cooling water into Sinclair Inlet. The new outfall and diffuser would be located and configured to address potential localized impacts to ambient water quality. Effluent quality and quantity would comply with NPDES permit requirements for the new outfall.

2.3.2.5 Process Water Collection, Treatment, and Discharge System

The process water/oily waste treatment system (PWOWTS) is still in the design phase but would include the following:

- The PWOWTS, including associated tanks, would be collocated in a distinct location on the M2D2 Dry Dock apron.
- The process water collection system (PWCS) would be designed for collection and conveyance of the 100-year storm event (removal of this volume from the dry dock floor).
- The PWCS would feature a grit trap and oil-water separator that would treat water in the drydock floor prior to the process water vault in the pump well and PWOWTS tanks.
- The process water collection system (PWCS) would include three pumpwell conveyance pumps for capacity and redundancy.
- Water from within the process water vault may be discharged directly to the sanitary sewer system, based on qualifying water quality parameters (turbidity and conductivity).
- All process water sent through the PWOWTS for treatment would be discharged to the sanitary sewer and/or Sinclair Inlet after treatment.

Permitting and compliance design considerations would include:

- PWCS and PWOWTS discharge to the sanitary sewer or Sinclair Inlet would be in accordance with applicable permit requirements.
- The grit trap and oil water separator in the drydock floor would provide treatment for 91 percent of total storm event volumes over a multi-decade period of record, including the 10-year storm.
- The PWOTWS, storage tanks, process water vault, and grit trap/oil water separator would be sized to meet the Runoff Treatment BMP standards in the Washinton Department of Ecology Stormwater Management Manual for Western Washington.
- Beyond a maximum PWOWTS processing capacity and when discharge directly to the sanitary sewer is not available, water within the process water vault would be bypassed directly to Sinclair Inlet.
- Process water treatment would continue concurrently during bypass events, or as otherwise determined by the PWOWTS final operational design.
- The system would be designed to ensure health and safety, based on the amount and type of treatment chemicals managed at the Process Treatment Facility.

The PWOWTS operational design would include:

- All aspects of process water conveyance; gross solids removal; pumpwell interface; water storage, treatment, bypass, and discharge would be automated, to the extent practicable to align with the overall operational architecture of the process water management systems.
- Process water pumpwell conveyance pumps would be submersible and appropriately sized.
- For PWOWTS redundancy, two complete systems would be sized at a pre-determined percent split or equal capacity.

2.3.2.6 New Forge Shop

The current forge shop at PSNS & IMF would be demolished as part of Alternative 2 (Figure 2-2). The Navy would construct a new larger forge shop and associated parking area on NAVBASE Kitsap-Bangor. The number of employees would not increase.

A new forge shop would be constructed on an undeveloped site at NAVBASE Kitsap-Bangor (Figure 2-3). The new structure, parking areas, and storage lot would create new permanent impervious surface. The forge shop would include open storage and parking for up to 35 vehicles. A two-lane paved road would be constructed to access the new forge shop location. The exact locations of these components may change slightly but would be within the area shown in Figure 2-3.

2.3.2.7 New Pier 2

A new Pier 2 would be built west of Pier 3. The new Pier 2 would serve as a repair pier that could also support inactivations. The new Pier 2 would consist of a northern wharf structure joined to a southern pile-supported pier. The pier deck elevation would account for future sea level rise. The design life of Pier 2 would be 75 years. A new sheet pile wall would be constructed along the shore.

Construction of the new pier would include:

- Dredging for adequate draft pier-side berthing basins
- Pile driving for the new pier and sheet pile wall
- Backfilling behind the new sheet pile wall
- Construction of a cast-in-place concrete deck
- New fire protection system
- New storm drain features
- Anti-terrorism features
- Portal crane tracks
- Lighting
- Fender piles
- Installation of utility trenches at the pier's exterior edges
- Armoring slopes beneath the new pier with riprap

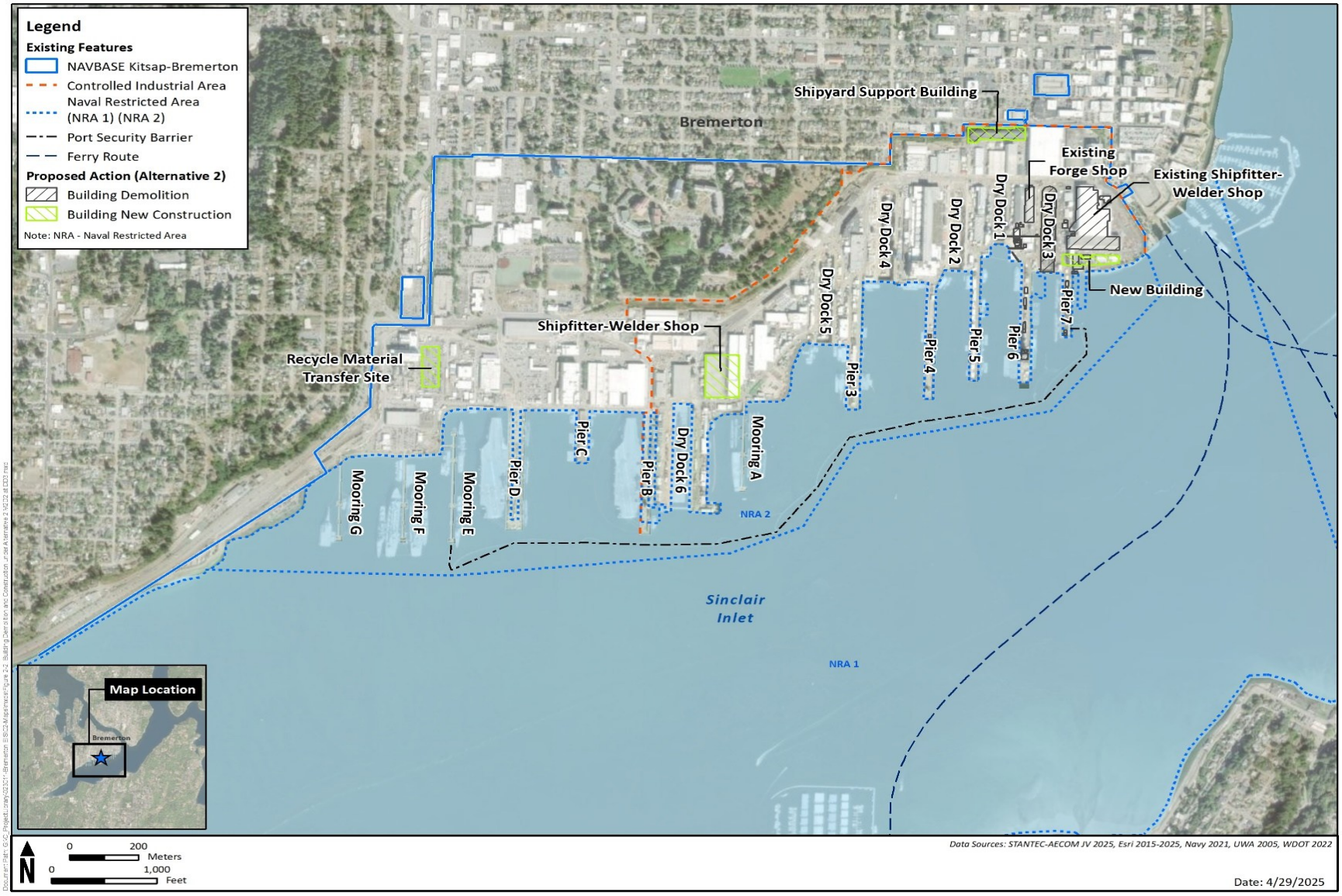


Figure 2-2 Building Demolition and Alteration under Alternative 2 M2D2 at DD3

Figure 2-3 Components of Alternative 2 at NAVBASE Kitsap-Bangor

Utilities would include electrical, sanitary sewer, stormwater, communication, information technology, and mechanical utilities such as compressed air, saltwater, freshwater, and oily waste systems. Upon completion of the pier structure, three new utility buildings would be constructed on the pier deck. Once constructed, Pier 2 would function as a repair pier that could also support inactivations.

2.3.2.8 Demolition of Piers, Moorings, and Deconstruction and Removal of the Hammerhead Crane

Construction of M2D2 at the DD3 location would require the Navy to demolish Piers 6 and 7, which are located in the M2D2 footprint. Alternative 2 would also include demolition of Pier 4. As discussed in Section 1.4.2, these existing piers do not meet UFC design standards for seismic performance or are expected to perform poorly in seismic events. Demolition activities would be sequenced with construction of replacement piers to enable the Navy to relocate existing operations prior to removal of each pier or mooring. Demolition would include removal of existing buildings located on the piers, pier decking, utilities, quay walls, concrete pilings, and pile foundations. On Pier 6, the large steel-framed Hammerhead Crane would be deconstructed and removed. Piers 4 and 6 are supported by large-diameter concrete columns supported by very large bell-shaped concrete bases that are supported either by the seafloor itself or by buried clusters of untreated timber piles. Removal of the columns and large concrete footings would require dredging, cutting off columns, cutting concrete bases into sections, and lifting pieces out by crane. Dredged material, untreated timber piles, and construction debris from pier demolition would be processed and disposed of in accordance with federal, state, and local regulations.

2.3.2.9 Pier 4 Replacement

The existing Pier 4, built in 1914, is a repair pier. To meet the need for pier capacity, the Navy would build a new Pier 4 in the location of the current Pier 4. The new Pier 4 would serve as a repair pier that could also support inactivations. The pier deck elevation would account for future sea level rise. The design life of Pier 4 would be 75 years. A new pile wall would be constructed to replace the existing quay wall where Pier 4 connects to the shore.

Construction of the new pier would include:

- Dredging for deeper pier-side berthing basins
- Pile driving for the new pier and quay wall
- Construction of a cast-in-place concrete deck
- Construction of a new adjacent quay wall
- New fire protection system
- New storm drain features
- Anti-terrorism features
- Portal crane tracks
- Lighting
- Fender piles
- Installation of utility trenches at the pier's exterior edges

Utilities would include electrical, sanitary sewer, stormwater, communication, information technology, and mechanical utilities such as compressed air, saltwater, freshwater, and oily waste systems. Upon completion of the pier structure, three new utility buildings would be constructed on the pier deck. Once constructed, Pier 4 would serve as a repair pier that could also support inactivations.

2.3.2.10 Upland Facility Demolition and Replacement

Under Alternative 2, construction of M2D2 at the DD3 location would require the Navy to demolish facilities within the M2D2 footprint, including approximately 30 permanent buildings and utility facilities, and demolish or relocate more than 50 trailers, modular units, sheds, and enclosures. The Navy would demolish and replace the storage facility with a larger shipyard support building to accommodate functions displaced by the construction of M2D2 at DD3. The Navy would demolish and replace the shipfitter-welder shop. In addition, the Navy would modify Streets E, F, and H. The Navy may continue to fund existing off-installation leases to accommodate previously displaced functions.

2.3.2.11 Radio Hill Complex Expansion at NAVBASE Kitsap-Bangor

Construction of M2D2 at DD3 would impact existing laydown space (paved areas used to store and stage equipment and materials) within the M2D2 footprint. M2D2 would be larger than DD3, and the Navy could not replace all of the lost laydown space at PSNS & IMF. To replace some PSNS & IMF space and functions lost due to construction of M2D2, the Navy would permanently expand the existing Radio Hill complex at NAVBASE Kitsap-Bangor (see Figure 2-3). Expansion of Radio Hill complex would include paving an existing gravel road, constructing new paved areas for storing and moving equipment and material, and extending utilities (water, sewer, electric, and telecommunications) to serve the existing and expanded area. The Radio Hill complex expansion would be sized to accommodate functions that would be impacted by construction of M2D2 at a 1:1 ratio. Two new buildings with employee parking areas would be constructed (employee building and work building). The exact locations of these components may change slightly but would be within the area shown in Figure 2-3.

2.3.2.12 Caisson Transport

Alternative 2 would require construction and delivery of two caissons, one for M2D2 and one spare caisson. The new caissons may be pre-fabricated as far away as Norfolk, Virginia and be transported via a heavy-lift vessel from Norfolk, Virginia to Bremerton, Washington. For purposes of assessing transportation-related impacts, this route is used to analyze the longest potential distance. Each caisson delivery would require a separate dedicated vessel trip; these two trips would be months to years apart. The route would be up to 7,082 nautical miles long, passing through the Panama Canal and north along the West Coast to Washington State (Figure 2-4).

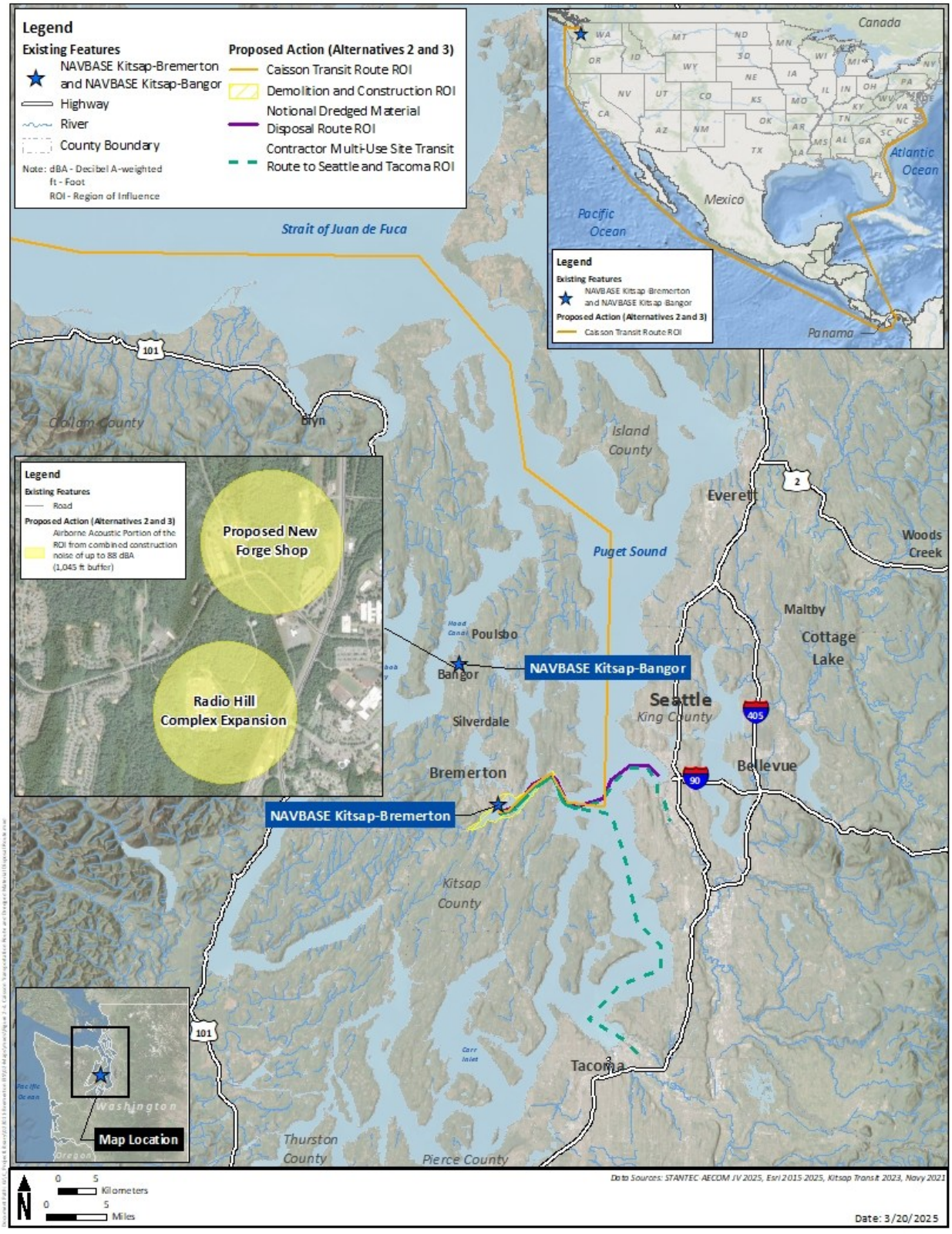


Figure 2-4 Caisson Delivery Transit Route and Contractor Multi-Use Site(s) Route

2.3.2.13 Contractor Multi-use Site(s)

The Navy anticipates that construction would require one or more off-site locations for storage, processing, and transfer of waste and construction materials. The contractor multi-use site(s) would be approximately 20 to 50 acres in size and located in the Puget Sound area, potentially at the Port of Seattle and/or the Port of Tacoma. The construction contractor would determine the exact location and size of the contractor multi-use site(s). The contractor would transport material to and from the contractor multi-use site(s) primarily via barge, although some trucks may be used.

Assumptions for the location and operation of the contractor multi-use site(s) include:

- Site(s) would be in existing industrial area(s) permitted and zoned for industrial activities such as truck, barge, and rail traffic; heavy equipment operation; material processing; and transfer of materials for disposal.
- Site(s) would have access to highway, rail, and water.
- Site(s) would include all utilities (water, power, and sewer).
- Site(s) would include an area for temporary office space and restrooms.
- The construction contractor would procure and operate the contractor multi-use site(s) in accordance with all applicable laws, regulations and permits.
- Site(s) would be developed and used to:
  - Dewater excavated material to meet the disposal facility's acceptance criteria.
  - Dewater unsuitable dredged material to meet the disposal facility's acceptance criteria.
  - Process water from dewatering would be treated (filtered at minimum) and discharged in accordance with the project's water quality certification and NPDES permit or State Waste Discharge permit, or containerized for off-site disposal at an approved disposal facility.
- Excavated and dredged material handled at the site(s) would come from a CERCLA site and are not expected to contain a hazardous level of contamination.
- The offsite contractor multi-use site(s) could be used for many purposes in support of the project such as receiving dredge and excavation material, receiving and processing demolition debris, and offloading of concrete, ballast rock, granular fill, steel, and other construction materials and equipment. Considering the many potential uses, there is potential for the site to see approximately 5,000 barge trips over the life of the project.
- The offsite contractor multi-use site(s) would offer the ability to transfer material from barges to trucks and/or rail car (if available) or truck/rail car to barge and also supply some storage capacity. The material from the estimated 5,000 barges would lead to traffic from the transload site(s) of approximately 55,000 rail cars or 500,000 trucks over the life of the project.
- Site(s) would also support storage of equipment and/or construction materials).
- Site activities would include routine equipment/facility maintenance and refueling of equipment. Stormwater and fugitive dust BMPs would be implemented, such as wheel wash and dust control measures. A site-specific SPCC plan would be developed and implemented.
- Operations would occur 24 hours per day and would require lighting at night.

2.3.3 Alternative 3, Multi-Mission Dry Dock at Mooring A

Under Alternative 3, the Navy would construct and operate a new M2D2 in the location of existing Mooring A. A new Wharf 2 would be constructed on the outer east wall of M2D2. The Navy would demolish Mooring A, Pier 4 construction, and deconstruct, and remove the Hammerhead Crane on Pier 6. The Navy would modify Moorings E, F, and G to accommodate existing stored inactivated, defueled nuclear-powered ships that are currently stored at Mooring A. To ensure adequate pier capacity to accomplish mission requirements, the Navy would replace Pier 4. The Navy would dredge to create a new turning basin, and adequate draft at wharves and piers. The Navy would also expand the Radio Hill complex at NAVBASE Kitsap-Bangor. A comparison of new and existing structures is shown in Table 2-5, and Table 2-6 provides a summary of facilities impacted by construction of the M2D2 for Alternative 3. Components of Alternative 3 are shown in Figures 2-5, 2-6, and 2-7.

Operation under Alternative 3 would generally follow the same shipyard procedures for scheduling and completing maintenance and decommissioning. Operational shipyard workforce would not significantly change after construction of Alternative 3 is complete. Under Alternative 3, some workforce would shift to new facilities at NAVBASE Kitsap-Bangor.

2.3.3.1 Multi-Mission Dry Dock at Mooring A and Wharf 2

Under Alternative 3, the existing Mooring A would be demolished and a new M2D2 would be built in the same location. Mooring A is the current designated storage location for inactivated nuclear ships. All currently stored ships would be relocated to Moorings E, F, and G. The Navy found no reasonable alternatives for this component. PSNS & IMF is the only public Navy shipyard approved to recycle inactivated nuclear-powered vessels. Other than Moorings E, F, and G, all other berthing facilities at NAVBASE Kitsap-Bremerton are dedicated to other work or are proposed to be removed as part of the Proposed Action. PSNS & IMF inactivation and recycling missions require multiple moves to and from the storage location per year, and access is also required to remove parts and equipment to support the active Fleet.

Wycoff Way would be reconfigured. Table 2-6 provides a summary of facilities impacted by construction of the M2D2 for Alternative 3.

Due to the different soil conditions at the Mooring A site, the new M2D2 would be a concrete hydrostatic dry dock, meaning that the weight of the dry dock walls and floor would resist external water pressure forces without a separate groundwater pressure relief system. M2D2 coping height elevation would account for future sea level rise. The design life of M2D2 would be 150 years. Wharf 2 on the east side of the M2D2 would serve as a CVN repair pier. The wharf deck elevation would account for future sea level rise.

Site preparation for M2D2 construction would be similar to Alternative 2 with the following exceptions: in addition to constructing a temporary pile-supported multi-use fixed access pier, a temporary loading dock would be installed for construction access, inactive vessels at Mooring A would be relocated (as stated above), and the crane testing location would be relocated. Unlike Alternative 2, no additional saltwater pumps would be installed during site preparation, and the RCD and recycling hub and RCD barge storage near DD3 would not be affected.

Table 2-5 Alternative 3 Comparison of New and Existing Structures

Component	Existing Structure			New Structure		
	Type	Location	Year Completed	Proposed Construction Type	Location	Estimated Construction Start Year
DRY DOCKS						
M2D2 at Mooring A New construction	N/A	NAVBASE Kitsap-Bremerton	N/A	Build new hydrostatic dry dock	NAVBASE Kitsap-Bremerton	2029
PIERS AND MOORINGS						
Wharf 2, part of M2D2 New Construction	N/A	NAVBASE Kitsap-Bremerton	N/A	Build new CVN repair Pier	NAVBASE Kitsap-Bremerton	2029
Mooring A Demolish	Mooring Pier	NAVBASE Kitsap-Bremerton	1946	Demolish Mooring A. Mooring A would not be replaced.	NAVBASE Kitsap-Bremerton	2027
Mooring E Modify	Mooring Pier	NAVBASE Kitsap-Bremerton	1946	Construct Mooring Dolphins	NAVBASE Kitsap-Bremerton	2027
Mooring F Modify	Mooring Pier	NAVBASE Kitsap-Bremerton	1946	Construct Mooring Dolphins	NAVBASE Kitsap-Bremerton	2027
Mooring G Modify	Mooring Pier	NAVBASE Kitsap-Bremerton	1946	Construct Mooring Dolphins	NAVBASE Kitsap-Bremerton	2028
Pier 4 Demolish and replace	Repair Pier	NAVBASE Kitsap-Bremerton	1914	Demolish Pier 4 and build new pier	NAVBASE Kitsap-Bremerton	2036
OTHER						
Hammerhead Crane Deconstruct and remove	Crane	NAVBASE Kitsap-Bremerton	1933	Deconstruct and remove, no replacement	NAVBASE Kitsap-Bremerton	2027
Radio Hill complex expansion	Existing gravel laydown area	NAVBASE Kitsap-Bangor	N/A	Pave existing gravel area and construct new paved area. Construct four new buildings with employee parking areas: service building, woodworking shop, and two storage facilities.	NAVBASE Kitsap-Bangor	2029

Component	*Existing Structure*			*New Structure*		
	Type	*Location*	*Year Completed*	*Proposed Construction Type*	*Location*	*Estimated Construction Start Year*
Upland Facilities Demolish and replace	Permanent buildings and utility facilities, approximately 5 enclosures	NAVBASE Kitsap-Bremerton	numerous	Demolish approximately 26 permanent buildings and utility facilities, approximately 5 enclosures. Construct a new 4-story vehicle parking garage. Construct two new structures and covered storage areas	NAVBASE Kitsap-Bremerton	to be determined

Legend: ~ = approximately; CVN = aircraft carrier; DD = dry dock; M2D2 = multi-mission dry dock; N/A = not applicable; NAVBASE = Naval Base; PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility

Table 2-6 Facilities Impacted by M2D2 Construction for Alternative 3

Proposed Change	*Facility*	
Demolish	• Mooring A • Storage Facility • Hazardous Abatement Facility • Temporary Service Warehouse • Electrical Substation 79 • Canteen • Woodworking/Boat Shop • Small Craft Pier • Steam Cleaning Facility • Hose Cleaning and Test Facilities (2) • Collimation Tower • Crane Storage Facility	• Trailer – Modular Office • Hull Treatment Facility • Storage Enclosures (4) • Condo 51 • Metal Storage Enclosure • Asphalt and concrete paving • Hammerhead Crane on Pier 6
Modify	• Wycoff Way	
New Construction	• M2D2 • East Apron • West Apron • East Mole • West Mole • Wharf 2 • Saltwater Pumphouse East • Saltwater Pumphouse West • Dry Dock Pumphouse • Process Water/Oily Waste Treatment Plant • Low-pressure Compressed Air Building • High-pressure Compressed Air Building • Saltwater Cooling and Distribution System • Control Center Building • Sewer Lift Station • Shore Tie Substations • Industrial Power Substations	• Medium Voltage Substations, east and west • Asphalt and concrete paving • Shipyard support building • Food service building inside CIA • Communications building inside CIA; Steam Cleaning Facility at NAVBASE Kitsap-Bremerton parking lot; • Hose Cleaning and Test Facility at NAVBASE Kitsap-Bremerton parking lot; • Covered storage area in NAVBASE Kitsap-Bremerton parking lot; vehicle parking garage at NAVBASE Kitsap-Bremerton • Radio Hill complex expansion • Services building at Radio Hill complex expansion at NAVBASE Kitsap-Bangor; • Woodworking shop at Radio Hill complex expansion at NAVBASE Kitsap-Bangor; • Storage facility at Radio Hill complex expansion at NAVBASE Kitsap-Bangor; • Storage facility at Radio Hill complex expansion at NAVBASE Kitsap-Bangor; • Covered storage areas at Radio Hill complex expansion at NAVBASE Kitsap-Bangor • Support area at Radio Hill complex expansion at NAVBASE Kitsap-Bangor

Legend: CIA = Controlled Industrial Area; M2D2 = multi-mission dry dock; NAVBASE = Naval Base

Figure 2-5 Components of Alternative 3 at NAVBASE Kitsap-Bangor

Figure 2-6 Components of Alternative 3: M2D2 at Mooring A

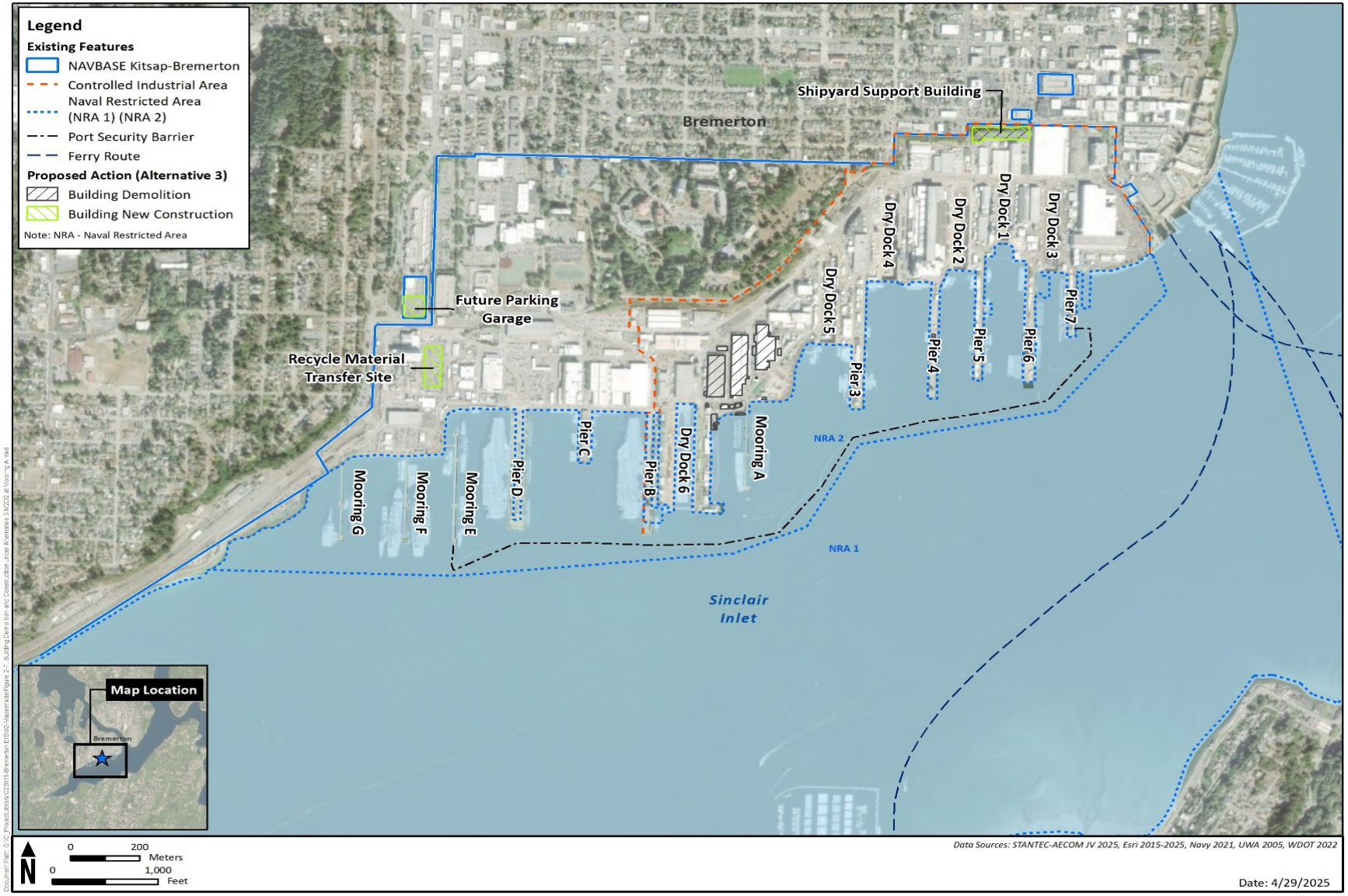


Figure 2-7 Building Demolition under Alternative 3 M2D2 at Mooring A

Due to soil conditions at Mooring A, it would not be feasible to dewater the site to construct M2D2 in the dry using a cofferdam. Instead, construction of the dry dock floor and walls would occur by setting precast form units on the prepared seafloor using a floating derrick crane, then filling the precast units with concrete via tremie placement. For tremie placement, wet concrete would be placed in boxes or hoppers above water and forced downward through a pipe using gravity or pumps, ending inside the precast units. The tremie method is used to minimize contact between the wet concrete and surrounding water. Installation of a temporary sheet pile cutoff wall just offshore would be followed by excavation and disposal of onshore and nearshore material. The temporary sheet pile cutoff wall and temporary loading dock would then be removed, and the M2D2 footprint would be dredged to prepare for installation of dry dock caisson foundations (large concrete blocks) and pilings. After dredging is complete, a new temporary loading dock would be installed, and dry dock caisson foundations would be placed on the seafloor. Once the dry dock floor, walls, and caisson are in place (see Alternative 2 for caisson description), additional piles would be driven to support new quay walls and M2D2 front and rear structures. Utilities would be installed, followed by concrete decks on all surfaces, including new Wharf 2. Up to two concrete batch plants, one on-land and one barge-based, would be positioned to supply material for the new dry dock.

Dredged material and construction debris would be processed and disposed of in accordance with federal, state, and local applicable regulations. After construction is complete, the Navy would remove the temporary pile-supported multi-use fixed access pier, and the temporary loading dock. The Navy would modify some PSB buoys and anchors in the vicinity of the new M2D2. The PSB would not extend farther south than the current PSB alignment and the area within the PSB will not increase. The M2D2 in Alternative 3 would include the same components, utilities, and systems as M2D2 in Alternative 2, including installation of a dry dock caisson, flooding and dewatering system, saltwater cooling and distribution system, and PWCS as described in Sections 2.3.2.2 through 2.3.2.5. Wharf 2 would include:

- Dredging for a pier-side berthing basin
- New fire protection system
- New storm drain features
- Anti-terrorism features
- Crane tracks
- Lighting
- Fender piles
- Installation of a utility trench east of former pier 8
- Construct a temporary pile-supported multi-use fixed access pier east of Pier 7

Utilities would include electrical, sanitary sewer, stormwater, communication, information technology, and mechanical utilities such as compressed air, saltwater, freshwater, and oily waste systems. South of the new M2D2, a new turning basin would be dredged (see Figure 2-6). Once M2D2 is complete, the Navy does not anticipate the need for maintenance dredging. Once constructed, M2D2 operation and function are expected to remain largely the same as current dry docks, with the added ability to support Ford-class aircraft carriers.

2.3.3.2 Demolition of Mooring A, Pier 4, and Deconstruction, Demolition, and Removal of the Hammerhead Crane

Construction of M2D2 at the Mooring A location would require the Navy to demolish Mooring A. Alternative 3 would also include demolition of Pier 4. Demolition would occur as described under Alternative 2. Although Pier 6 would not be demolished under this alternative, the large steel-framed Hammerhead Crane on Pier 6 would be deconstructed and removed.

2.3.3.3 Pier 4 Replacement

Pier 4 would be replaced as described under Alternative 2.

2.3.3.4 Upland Facility Replacement

Under Alternative 3, construction of M2D2 at the Mooring A location would require the Navy to modify or demolish facilities within the M2D2 footprint. The Navy would modify Wycoff Way, demolish approximately 26 permanent buildings and utility facilities, and demolish or relocate approximately five enclosures (see Figure 2-7). Personnel, functions, and equipment from demolished facilities would be relocated to the following new buildings and storage areas:

- new shipyard support building
- two new buildings within the CIA
- two new buildings and storage area at an existing NAVBASE Kitsap-Bremerton parking lot
- four new buildings and storage area at the expanded Radio Hill complex at NAVBASE Kitsap-Bangor
- the Navy may continue to fund existing off-installation leases to accommodate previously displaced functions.

The Navy would replace lost parking spaces on NAVBASE Kitsap-Bremerton with a new parking garage on Navy property. The 4-story garage would include 400 vehicle parking spots.

2.3.3.5 Mooring Modification for Relocation of Stored Inactive Ships

Alternative 3 would demolish Mooring A, which provides long-term floating protective storage of inactivated, defueled nuclear-powered ships. Inactivated, nuclear-powered ships would be relocated to Moorings E, F, and G, which are currently used for storing inactivated conventional-powered vessels both inside and outside the PSB (see Figure 2-1).

Inactivated ships currently located at Moorings E, F, and G would be relocated to other suitable locations.

Modifications would be required at Moorings E, F, and G, including, but not limited to, buoys, dolphins, and camels. Dolphins are marine structures that extend above the water level that are not connected to shore. Structural dolphins guide the berthing or mooring ships. A camel is a structure used to maintain standoff or separation between a ship and a waterfront facility. Camels are required when berthing and mooring submarines to prevent damage to the submarine hull. A combination of in-water and overwater construction and temporary measures (such as breasting barges and camels) would be required.

The Navy would install or upgrade services to moor inactivated nuclear-powered ships at all of the proposed locations, including fire and flooding systems, a dehumidification system, cathodic protection, lighting, and associated electrical power distribution.

Use of Moorings E, F, and G would occasionally require a temporary opening and closing of the PSB. This activity is routine for all vessels that enter and depart PSNS & IMF. Moving inactivated, defueled nuclear-powered ships to any of these locations would not require modification of the PSB or dredging. Operation of Moorings E, F, and G will require construction of up to three new upland guard booths, upland fencing, and a Ship Services Support Building in the vicinity of Moorings E, F, and G. The design and location of the Ship Services Support Building could include re-use of existing facilities, relocation of existing trailers from Mooring A, or construction of a new upland facility.

2.3.3.6 Radio Hill Complex Expansion at NAVBASE Kitsap-Bangor

To replace some PSNS & IMF space and functions lost due to construction of M2D2 at Mooring A, the Navy would permanently expand the existing mission support area at NAVBASE Kitsap-Bangor. An existing gravel road to the mission support area would be improved and paved, and utilities (water, sewer, electric, and telecommunications) would be extended to serve the existing and expanded area. The Radio Hill complex expansion would include paving the existing gravel area, as well as constructing new paved areas for storing and moving equipment and material. Four new buildings with employee parking areas would be constructed: services building, woodworking shop, and two storage facilities.

2.3.3.7 Caisson Transport

The new caissons would be transported as described under Alternative 2.

2.3.3.8 Contractor Multi-use Site(s)

The contractor multi-use site(s) would be utilized as described under Alternative 2.

2.4 Construction Schedule and Preliminary Design Quantities

This section provides details of construction actions and quantities such as schedule, building demolition, dredging, and pile driving that is used as the foundation for environmental impact analysis in Chapter 3.

2.4.1 Construction Sequencing and Methods

Each construction site would be excluded from the CIA during construction, including moving the PSB and installing a temporary CIA fence on the upland site. Table 2-7 shows construction sequencing for both action alternatives. The construction schedules are based on the following assumptions:

- Construction and demolition would be conducted primarily during daylight hours for 6 days a week but double shifts may be required.
- Dredging would be conducted up to 24 hours per day, 6 days a week.
- The in-water work window occurs each year between July 16 and February 15 of the following year, up to 214 days.
- Most construction equipment and material would be transported by barge with some transported by road or rail.

Table 2-7 Construction Sequencing

Bremerton Waterfront Infrastructure Improvements Construction Sequencing		*2027*	*2028*	*2029*	*2030*	*2031*	*2032*	*2033*	*2034*	*2035*	*2036*	*2037*	*2038*	*2039*	*2040*	*2041*
Alternative 2 (Preferred Alternative)	Pier 2 construction (includes dredging)	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No
	Radio Hill complex expansion at NAVBASE Kitsap-Bangor	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No
	Forge shop construction at NAVBASE Kitsap-Bangor	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No
	• Demolition of DD3, Hammerhead Crane, Pier 6, Pier 7, select pile foundations of former Pier 8, shipfitter-welder shop, forge shop, and other upland buildings • Construct new shipfitter-welder shop • Construct new shipyard support building • Dredging at DD3 and Piers • Construction of M2D2 at DD3 • 18 temporary mooring buoys	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
	Pier 4 demolition + replacement (includes dredging)	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Alternative 3	Mooring A demolition (includes dredging) Upland building demolition	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No
	Radio Hill complex expansion at NAVBASE Kitsap-Bangor	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No
	M2D2 construction at Mooring A 18 temporary mooring buoys	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
	Mooring E, F, and G modifications and Relocation of stored inactive ships	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No
	Hammerhead Crane deconstruction and removal	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Pier 4 demolition + replacement (includes dredging)	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Note: * = NAVBASE Kitsap-Bremerton location would include a 4-story vehicle parking garage. "Yes" indicates construction.

Legend: DD = dry dock; M2D2 = multi-mission dry dock; NAVBASE = Naval Base

2.4.1.1 Construction Workers

Since there are no on-installation parking sites for construction workers, the Navy expects the construction contractor to establish off-site contractor parking sites. Workers would arrive at the site by land transportation or by water. By land, construction workers would park at off-site locations and reach the worksite by foot or be transported by private construction-personnel buses or public transportation. By water, construction workers would arrive by commercial ferry or private construction-personnel ferries from Port Orchard and other locations within Puget Sound. Construction at NAVBASE Kitsap-Bremerton would require two shifts of construction personnel per day, with up to 1,000 workers per shift with one shift change per day. Construction at NAVBASE Kitsap-Bangor would require up to 100 workers per day for the forge shop and up to 50 workers per day for the Radio Hill complex expansion.

2.4.1.2 Construction Staging

Staging and laydown space would fall into three categories: on-site upland, on-site offshore, and off-site. The location and size of the on-site upland construction laydown areas would vary by construction activity but would be located within the CIA at NAVBASE Kitsap-Bremerton and disturbed areas at NAVBASE Kitsap-Bangor. Site locations would be restored when the laydown areas are no longer needed. On-site offshore staging and laydown space would be accomplished using barges and the temporary pile-supported multi-use fixed access pier east of Pier 7. The location and quantity of barges would be highly variable depending on the type of construction activities occurring at any given time. Construction staging and laydown would also occur off-site and is expected to be at existing industrial areas within the Puget Sound area, as described in Section 2.3.2.13.

2.4.1.3 Construction Material Delivery

Most construction equipment, construction materials, and waste would be delivered to and from NAVBASE Kitsap-Bremerton by barge to minimize congestion at shipyard gates and roads. However, the Navy expects some construction equipment, construction materials, and dredge and waste materials will arrive/depart by road through the Bremerton Gate and the vehicle inspection gate. The number of vehicles using these two gates would range from 25 to 50 truck trips per day per gate.

2.4.1.4 Temporary Mooring Buoys

During construction of either Alternative 2 or 3, the Navy would install approximately 18 temporary mooring buoys (each approximately 14 feet in diameter) in a nearby location (to be determined) to support construction of M2D2. The temporary mooring buoys would be installed in pairs and configured to moor two barges side by side. Each mooring buoy would be secured to the seafloor with a steel plate anchor and an anchor chain.

Installation of the steel plate anchor would be accomplished via one or a combination of the following techniques:

- suction embedment, where a hollow pile is lowered to the seafloor, water is pumped out of it, and the resulting suction and pile's own weight will allow the pile and anchor to embed into the sediment
- dynamic embedment, using a rocket- or dart-shaped anchor that free-falls through the water column and embeds itself into the seafloor
- traditional pile driving

After construction is complete, the temporary mooring buoys, anchors, piles, and anchor chains would be removed.

2.4.2 Pile Installation and Removal

2.4.2.1 Pile Installation Methods

The Navy will implement appropriate measures to avoid and minimize impacts during pile installation and removal. Anticipated pile installation methods for the construction of M2D2, Piers, mooring dolphins, and temporary mooring buoys (if required) are assumed as follows:

- Steel pipe and sheet piles would be driven using vibratory and impact driving. Pre-drilling may be required for some piles.
- Prestressed concrete piles would be driven using an impact hammer only; vibratory hammers would not be used. Pre-drilling may be required for some piles.
- Piles would be used for upland portal crane track foundations and would be installed using a rotating hollow shaft auger advanced into the soil to the desired pile depth. Concrete or grout would then be pumped into the void as the auger is slowly removed. A reinforcement cage would then be placed in the freshly poured concrete or grout. This method is typically used for smaller piles (12- to 24-inch diameters).
- Upland shoring/cutoff walls will be installed using clam shells, hydromills, or combination of equipment. The clam shell process uses hydraulic buckets to remove material, while the hydromill uses a rotary head with a fluid slurry mixture to facilitate pumping out the excavated material.
- Multiple crews may be driving piles concurrently.

2.4.2.2 Pile Removal Methods

- Existing timber piles proposed for removal during pier demolition would either be extracted using a vibratory driver or cut off below the mud line and removed from the water using mechanical methods and BMPs outlined in Washington State Department of Natural Resources (WDNR) (2017) and EPA (2016).
- Existing and temporary steel piles would be extracted using a vibratory driver or cut off below the mud line.

2.4.2.3 Pile Installation Equipment

Pile elements would include steel pipe piles, steel sheet piles, precast prestressed concrete piles (square, octagonal, or round), precast prestressed concrete fender piles, clamshell or hydromill (for upland shoring/cutoff walls), and auger cast concrete piles. Equipment used to install in-water piles would be located on barges or floating platforms, while equipment installing upland piles would be located on land. The respective installation equipment required for each pile element type is listed below.

Auger Cast Pile Installation (Upland)

Auger drilling would be performed primarily with marine derricks but could include tracked cranes.

Steel Sheet Pile Installation (Some In-water)

Work would be performed primarily with marine derricks but could include tracked cranes. Installation would be performed with vibratory and impact drivers to the design elevation. Pre-drilling may be required for some piles.

Steel Pipe Pile Installation (Some In-water)

Work would be performed primarily with marine derricks but could include tracked cranes. Installation would be performed with vibratory and impact drivers for initial and some final installation efforts. An impact hammer would be used for final installation efforts and pile proofing.

Precast Concrete Pile Installation (In-water)

Work would be performed with marine derricks. Installation would be performed using a diesel impact hammer for installation efforts.

Cranes

Upland work would be performed with mobile cranes.

2.4.2.4 Piles Removed and Installed

Under Alternative 2, a total of up to 4,891 existing in-water piles would be removed during demolition of piers and wharves. Up to 29 of the total in-water piles removed would be creosote-treated timber piles. To construct all components of Alternative 2, permanent in-water piles installed would be up to 5,410 concrete and steel pipe piles and 1,950 linear feet of steel sheet piles. Temporary in-water piles installed and removed would be up to 800 steel pipe piles and 350 linear feet of steel sheet piles. Upland piles would also be installed and would include a total of 2,800 concrete and steel pipe piles and 800 linear feet of sheet piles.

Under Alternative 3, a total of 796 existing in-water piles would be removed during demolition of piers and wharves. Up to 27 of the total in-water piles removed would be creosote-treated timber piles. To construct all components of Alternative 3, permanent in-water piles installed would be up to 3,303 concrete and steel pipe piles and 1,665 linear feet of steel sheet piles. Temporary in-water piles installed and removed would be up to 740 steel pipe piles and 900 linear feet of steel sheet piles. Upland piles would also be installed and would include a total of 1,774 concrete and steel pipe piles and 3,184 linear feet of steel sheet piles. Table 2-8 provides a summary of piles removed and installed for each alternative.

Table 2-8 Permanent, Temporary, and Removed Piles

Permanent Piles Installed			*Existing Piles Removed*		*Temporary Piles (Installed and Removed)*	
Alternative	*Total Number of Piles*[1]	*Total New Sheet Piles (linear feet)*	*Total Piles Removed*	*Creosote-Treated Timber Piles Removed*	*Number of Steel Pipe Piles*	*Sheet Piles (linear feet)*
Alternative 2 In-Water	5,410	1,950	4,891	29	800	350
Alternative 2 Upland	2,800	800	-	-	-	-
Alternative 3 In-Water	3,303	1,665	796	27	740	900
Alternative 3 Upland	1,774	3,184	-	-	-	-

Notes: [1]Total number of piles includes steel and concrete pipe. Sheet piles are not included and are presented in their own column in linear feet.

2.5 Dredging, Overwater Coverage and Fill

2.5.1 Dredging

The material to be dredged generally consists of soft silty overburden (5 to 20 feet thick) overlying dense to very dense sand and gravel (course-grained glacially overridden deposits) as indicated in geotechnical boring information. Dredging would occur per Table 2-9 to accommodate pier demolition and to facilitate construction of the cofferdams and drydock foundation. The existing water depths are not adequate in front of proposed M2D2 at Mooring A and Wharf 2, and these areas would require dredging. These proposed dredge areas vary by alternative, but would include a CVN Turning Basin, CVN Berthing Basin, and Auxiliary Berthing Basin.

Dredging operations would be performed using a combination of mechanical equipment (clamshell, backhoe, excavator). This may be supplemented by mechanical pretreatment equipment (chisel, hoe-ram, and/or drag ripper). The dredging of the coarse grained glacially overridden deposits would extend to a maximum depth of approximately 40 feet below the overburden. Pretreatment of the coarse grained glacially overridden deposits may be required to loosen and break up very dense coarse grained glacially overridden deposits prior to dredging with mechanical methods. A hydraulic (cutter head) method can be used to pre-treat the coarse grained glacially overridden deposits by cutting the material and leaving the broken material in-situ. Dredged material would be characterized to evaluate appropriate handling, treatment (if necessary), transport, and disposal requirements. All dredged material would be processed and disposed of in accordance with federal, state, and local regulations. As part of the permitting process for in-water projects that include dredging, dredged material is characterized by chemical testing to determine disposal options. Sediment sampling results in dredge areas are compared to Dredged Material Management Program (DMMP) screening levels. Sediment that exceeds the DMMP screening levels is not suitable for open water disposal. Dredged material that is not suitable for open water disposal would be disposed of at upland permitted landfills. Dredged material suitable for open water disposal would be transported via barge to the permitted, non-dispersive open water disposal site in Elliott Bay, located approximately 14.3 nautical miles from NAVBASE Kitsap-Bremerton (see Figure 2-4).

Dredge volumes were calculated based on the existing mud line defined using the most recent hydrographic survey data (WSP 2021) and assuming either a 1-foot (Pier 2) or 2-foot (M2D2) overdredge allowance. Overdredge allowance is project-specific and defined based on a number of considerations, including anticipated type and size of dredging equipment, depth of dredging, equipment access, and dredging production schedule. Table 2-9 lists the approximate dredge quantities.

Table 2-9 Dredging, Overwater Coverage and Excavation at NAVBASE Kitsap-Bremerton

Action	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
Total dredging quantity (cubic yards)	867,450	1,651,000
Total dredging area (acres)	36.92	69
Dredging area – in areas with water depth <-30 feet (acres)	5.88	3.67
Dredging area – intersection with mapped aquatic vegetation (acres)	1.74	1.50
Dredging in areas with water depth < 30 feet – intersection with mapped aquatic vegetation (acres)	1.28	0.92
Net change in overwater coverage (acres)	1.37	5.47
Net change in overwater coverage (square feet)	88,427	238,273

Action	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
Temporary fill area (acres)	2.02	0
Temporary fill discharged below MHHW (cubic yards)	136,900	0
Permanent fill area (acres) – below MHHW	11.25	19.59
Permanent fill discharged below MHHW (cubic yards)	550,600	1,179,800
Upland excavation (cubic yards)	896,250	713,450
Fill discharged above MHHW (cubic yards)	484,000	693,800

Legend: < = less than; MHHW = mean higher high water

2.5.2 Excavation and Fill

Excavated material and construction debris from pier demolition would be processed and disposed of in accordance with federal, state, and local regulations. Excavation for Alternative 3 would be wider and deeper than Alternative 2. The project site would be excavated to construct the new M2D2 foundation, walls, and floor. Utility trenching would be required. Following dry dock completion, fill material would be excavated and disposed of at an approved landfill. No excavated material would be reused on-site or offsite. Table 2-9 provides preliminary design estimates of excavation quantity and fill for all components of each action alternative.

2.6 Best Management Practices

The Navy utilizes BMPs, policies, practices, and measures to reduce environmental impacts. Although BMPs are implemented to avoid, minimize, and/or reduce/eliminate impacts, BMPs are distinguished from potential mitigation measures because BMPs are: (1) existing requirements for the Proposed Action; (2) ongoing, regularly occurring practices; or (3) not unique to this Proposed Action. In other words, the BMPs identified in this document are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the NEPA environmental review or regulatory approval process. Appendix A includes a list of BMPs as well as other environmental commitments, monitoring and reporting requirements.

3 Affected Environment and Environmental Consequences

3.1 Approach to Analysis

This chapter presents a description of environmental baseline conditions and environmental consequences of each alternative, including the no-action alternative. Sections 3.1.1 and 3.1.2 summarize the approach to defining the affected environment and effects analysis for the resources evaluated in this EIS. Resources that are evaluated in detail are listed in Section 3.1.3.

3.1.1 Affected Environment

The affected environment includes the area where impacts from the Proposed Action or alternatives evaluated in this EIS could occur. This area is defined as NAVBASE Kitsap-Bremerton and the immediate surrounding area. NAVBASE Kitsap-Bangor is included for construction of the forge shop under Alternative 2 and expansion of a laydown area for both action alternatives. In addition, each resource area of the EIS defines a Region of Influence (ROI) for the purpose of effects analysis. The affected environment is characterized by baseline environmental conditions and reasonably foreseeable future actions (RFFAs), described below.

3.1.1.1 Reasonably Foreseeable Future Actions

A future action is considered an RFFA if it is (1) a planned action included in a federal, state, or local planning document; (2) an existing permit application; or (3) a fiscal appropriation that is likely (or reasonably certain) to occur.

Reasonably Foreseeable Future Actions – NAVBASE Kitsap-Bremerton

The RFFAs considered for NAVBASE Kitsap-Bremerton are summarized in Table 3.1-1 and described in further detail below. Navy and City of Bremerton RFFAs are depicted in Figure 3.1-1, and private development RFFAs are depicted in Figure 3.1-2.

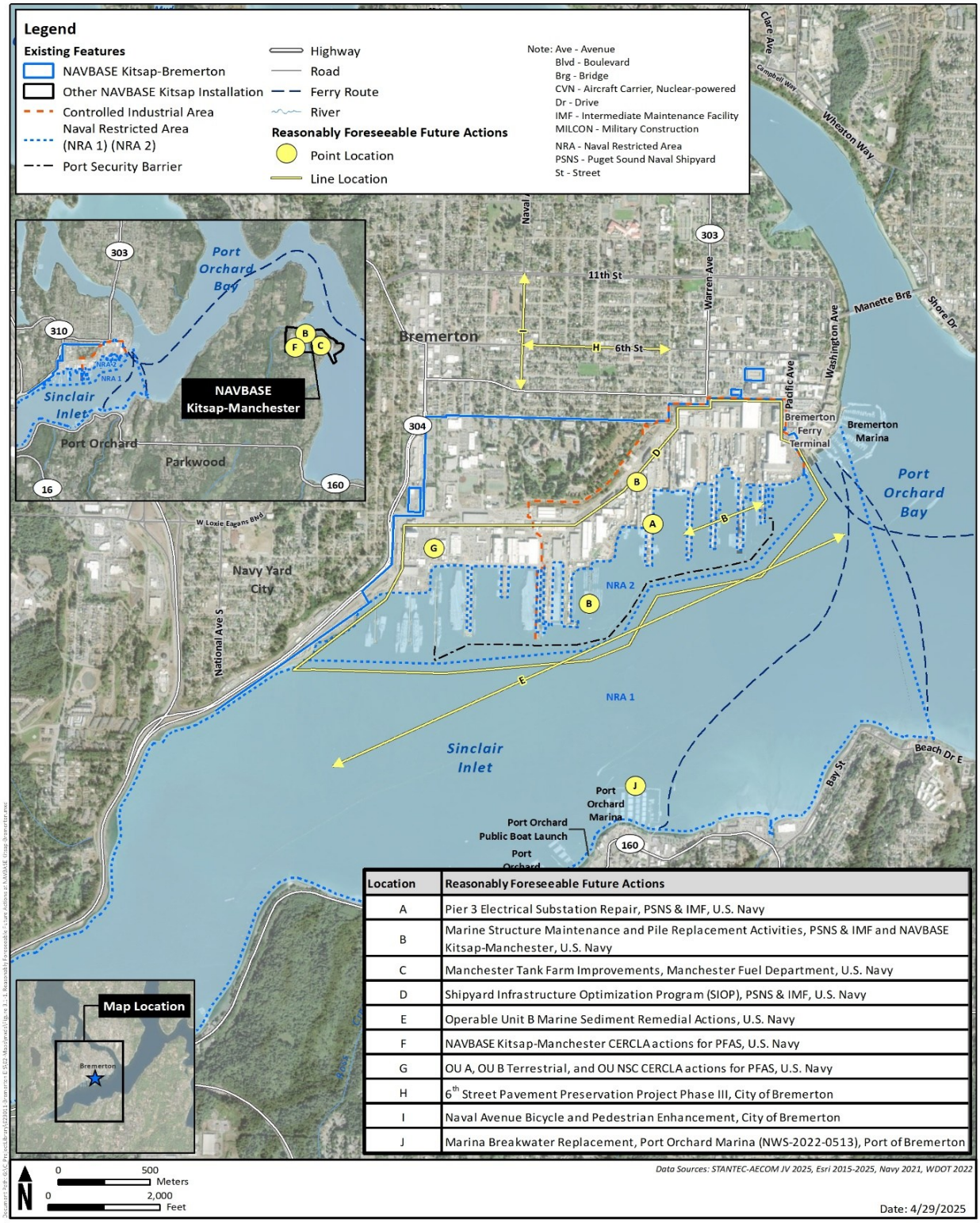
Table 3.1-1 Reasonably Foreseeable Future Actions – NAVBASE Kitsap-Bremerton

Corresponding Figure Location	*Reasonably Foreseeable Future Actions*	*Time Frame*
A	Navy – Pier 3 Electrical Substation Repair, PSNS & IMF	Planned for construction in 2027.
B	Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF and NAVBASE Kitsap-Manchester	Phase 1: ends 2026; Phase 2: 2026–2031.
C	Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	2021–2026.
D	Navy –SIOP, PSNS & IMF	Ongoing.
E	Navy – Operable Unit B Source Removal Actions	Estimated to begin in 2029 (pending SIOP in-water construction activities).
F	Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	Ongoing, initial remedial investigation scheduled to begin in 2025.
G	Navy – NAVBASE Kitsap Bremerton Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	Ongoing, initial remedial investigation scheduled to begin in 2025.

Corresponding Figure Location	*Reasonably Foreseeable Future Actions*	*Time Frame*
H	City of Bremerton – 6th Street Pavement Preservation Project Phase III	To begin in 2025.
I	City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Construction scheduled for 2026–2027.
J	Port of Bremerton - Marina Breakwater Replacement, Port Orchard Marina	2024–2029.
K	Private Development – The Beacon and Beacon II	Construction to begin in 2025.
L	Private Development – McWilliams Apartments	Construction ongoing as of 2025.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; NSC = Naval Supply Center; PFAS = per- and polyfluoroalkyl substances; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; SIOP = Shipyard Infrastructure Optimization Program

Sources: Navy 2018a, 2018b, 2019a, 2019b



Location	Reasonably Foreseeable Future Actions
A	Pier 3 Electrical Substation Repair, PSNS & IMF, U.S. Navy
B	Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF and NAVBASE Kitsap-Manchester, U.S. Navy
C	Manchester Tank Farm Improvements, Manchester Fuel Department, U.S. Navy
D	Shipyard Infrastructure Optimization Program (SIOP), PSNS & IMF, U.S. Navy
E	Operable Unit B Marine Sediment Remedial Actions, U.S. Navy
F	NAVBASE Kitsap-Manchester CERCLA actions for PFAS, U.S. Navy
G	OU A, OU B Terrestrial, and OU NSC CERCLA actions for PFAS, U.S. Navy
H	6th Street Pavement Preservation Project Phase III, City of Bremerton
I	Naval Avenue Bicycle and Pedestrian Enhancement, City of Bremerton
J	Marina Breakwater Replacement, Port Orchard Marina (NWS-2022-0513), Port of Bremerton

Figure 3.1-1 Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

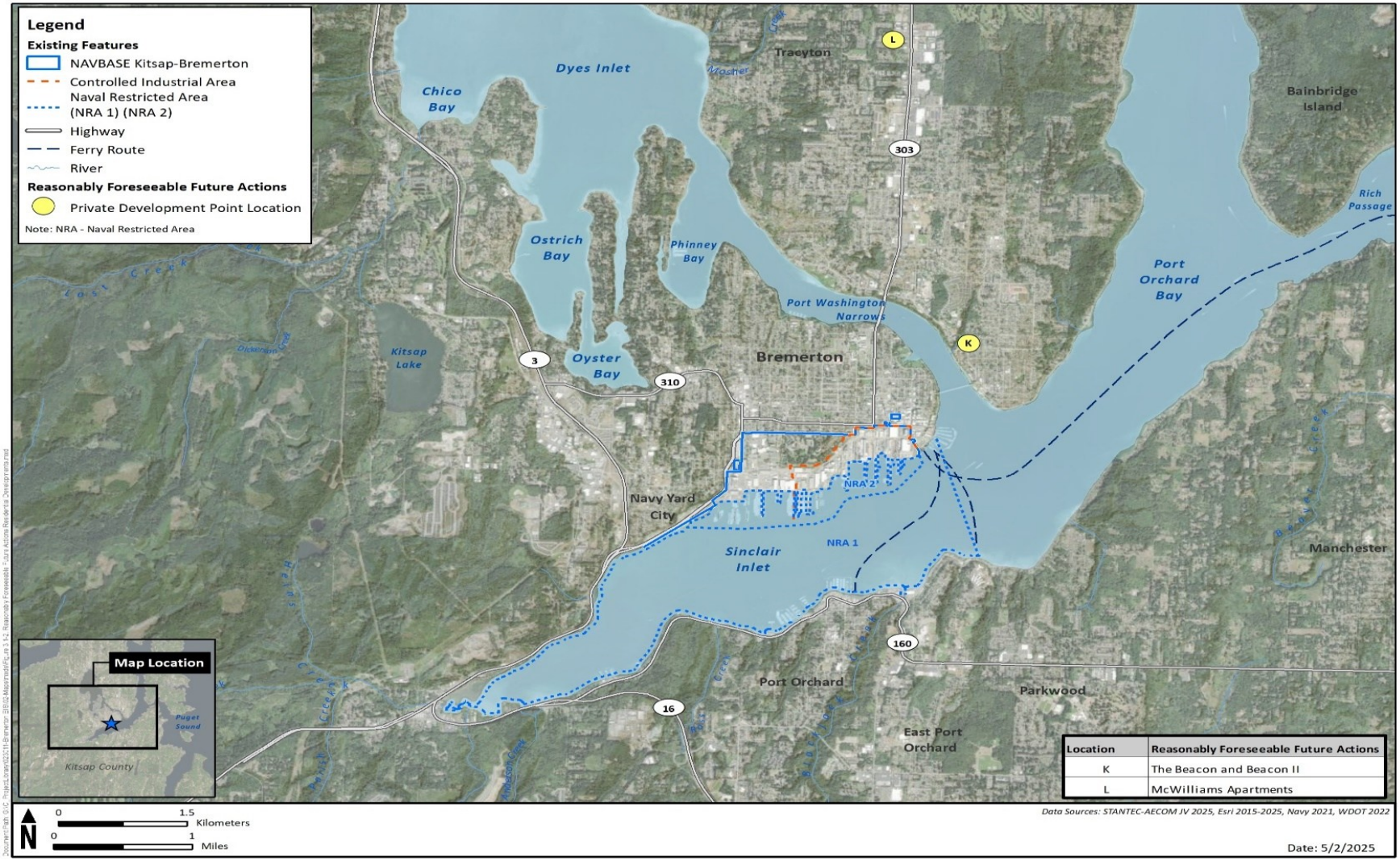


Figure 3.1-2 Reasonably Foreseeable Future Actions for Residential Development

Navy – Pier 3 Electrical Substation Repair

The project would repair an electrical substation at Pier 3 and upgrade existing electrical distribution equipment. This project is planned for construction in 2027.

Navy – Marine Structure Maintenance and Pile Replacement Activities

The Navy would conduct ongoing maintenance and repair activities on the 15 pile-supported structures located at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap Manchester (Navy 2019a). The activities would include pile repair and replacement and general maintenance. General maintenance includes deck resurfacing and recoating corroded metal components; repair activities on wet well concrete spalling, piers (including repairs to piles), and quay walls; and the repair or replacement of damaged or deteriorated guide piles systems, brow floats, pile caps, safety ladders, cable straps, camel and camel connections, and lighting. The location of maintenance and repair activities at NAVBASE Kitsap-Bremerton is depicted in Figure 3.1-1. The Navy signed a finding of no significant impact for the Proposed Action on June 25, 2019 (Navy 2019b). Phase I of these proposed activities at NAVBASE Kitsap-Bremerton is expected to be completed February 15, 2026. Phase II project activities are planned for 2026–2031.

Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester

The project involves constructing six aboveground storage tanks (ASTs) and permanently closing eight existing underground storage tanks (Navy 2018b). The new ASTs would be used for storing and distributing both F-76 and JP-5 fuel. The project location is depicted in Figure 3.1-1. Construction of the new ASTs would occur in three phases (two ASTs constructed per phase). Implementation began in 2021 and will continue for approximately 6 years.

Navy – Shipyard Infrastructure Optimization Program

SIOP is the Navy's comprehensive, long-term effort to invest in shipyard infrastructure and industrial equipment at the Navy's four public shipyards. The effort includes expanding shipyard capacity and optimizing shipyard configuration to meet the Navy's current and future nuclear-powered fleet maintenance requirements. Ongoing efforts at PSNS & IMF include advanced planning, engineering studies, computer models and simulations of shipyard processes, area development plans (ADPs), and installation master plans to optimize facility and equipment layouts. Implementation of SIOP has begun and is expected to continue over several decades.

At PSNS & IMF, several SIOP actions are planned to occur in the near-term, independent of the Proposed Action addressed in this EIS. The Navy is conducting separate NEPA analyses for these near-term actions, which include:

- Building demolitions: ship maintenance facility, hazardous abatement facility, and temporary service warehouse
- Building modifications – industrial skills center, gymnasium/bowling alley, public works support facility, club and personnel support detachment, and fleet support facility.
- Utility upgrades, including upgrade of the shipyard electrical backbone and electrical upgrades to support USS John F. Kennedy (CVN 79)
- Installation of a modular parking facility
- Railroad culvert improvements

- DD4 seismic repair
- Leases of off-site facilities

Future capital improvements, if funded by Congress, would result in numerous changes in upland facilities, buildings, and utilities, including substantial infrastructure demolition, construction, and upgrades. These actions would be addressed under separate NEPA analyses once Congress approves funding.

Navy – Operable Unit B Marine Source Removal Actions

The Navy is currently working with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) stakeholders on a Focused Feasibility Study regarding mercury contamination in sediment within Operable Unit B Marine (OU B Marine) and Sinclair Inlet. The Navy will not start any remedial action until M2D2 is complete, but future remedial actions are expected to include mercury control and in-water remediation actions. Construction of check-valves on three NAVBASE Kitsap Bremerton outfalls (including Outfall 15) is expected to begin in 2027. Check-valves will prevent seawater from advancing up the stormwater line during high tides. Other remedial actions would be designed and implemented in the future.

Navy - NAVBASE Kitsap-Manchester Comprehensive Environmental Response, Compensation, and Liability Act Actions for PFAS

The Navy is conducting ongoing CERCLA investigations at NAVBASE Kitsap-Manchester. The initial remedial investigation is scheduled to begin in 2025, with an additional remedial investigation scheduled for 2028. The necessity and magnitude of a remedial action would be based on per- and polyfluoroalkyl substances (PFAS) delineation and risk evaluation.

Navy – Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC Comprehensive Environmental Response, Compensation, and Liability Act Actions for Per- and Polyfluoroalkyl Substances

The Navy is conducting ongoing CERCLA investigations at OU A, OU B Terrestrial, and OU NSC. Initial remedial investigations are expected to begin in 2025-2026 with additional investigations between 2029 and 2033. The necessity and magnitude of a remedial action would be based on PFAS delineation and risk evaluation. Remedial investigation and remedial action work will be dependent on access during M2D2 associated construction activities.

City of Bremerton – 6th Street Pavement Preservation Project Phase III

The City of Bremerton is planning to re-pave 6th Street between Naval Avenue and Warren Avenue (City of Bremerton 2021). The project will include grinding and overlay, pavement markings, and other related street improvements, including upgrading curb ramps for compliance with the ADA. The project also includes replacement of a signal at Veneta Avenue. The project construction contract has been awarded (City of Bremerton 2025).

City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement

The City of Bremerton will reconfigure the Naval Avenue corridor (1st Street to 11th Street), providing bike lanes, wider sidewalks, and removal of barriers that are not compliant with the Americans with Disabilities Act (City of Bremerton 2021). The project includes pavement resurfacing; bike lanes, boxes, and detection; wider sidewalks; signal timing and phasing; intersection treatments; curb bulbs;

wayfinding signage; pavement markings; and modified storm drainage. Additional project work includes a feasibility study of roundabouts at major Naval Avenue intersections. Project design began in 2020 and the Right-Of-Way phase of the project is ongoing as of 2025.

Port of Bremerton – Marina Breakwater Replacement, Port Orchard Marina

The Port of Bremerton has proposed to replace the North Breakwater, East Breakwater, the approach floats and gangway at Port Orchard Marina in Sinclair Bay. The project would protect the marina and its vessels and provide Americans with Disabilities Act access to the breakwaters by installing an ADA-compliant gangway. The location of the new breakwaters would be within several feet of the existing breakwaters and would keep wave protection of the marina the same at the harbor entrance. After construction of the new breakwaters is complete, the existing breakwaters would be demolished. Construction is ongoing as of 2025 and is expected to be completed in early 2029.

Private Development – The Beacon and Beacon II

The Beacon and Beacon II are located on the east side of Port Washington Narrows (site "K" in Figure 3.1-2). The Beacon received approval permits in 2017. Beacon plans call for a four-story, 111-unit multifamily apartment building built over two levels of parking on 1.39 acres near the intersection of Lower Wheaton Way and Schley Boulevard. Beacon II would be a 186-unit building also on Wheaton Way (Kitsap Sun 2020). Building permits have been issued for both Beacon and Beacon II (Kitsap Sun 2021). Construction is expected to begin in 2025.

Private Development – McWilliams Apartments

McWilliams Apartments is a multiphase 304-unit apartment complex that will include 10 three-story apartment buildings with over 500 parking stalls, located 1 mile north of Kitsap Landing along the Highway 303 corridor in East Bremerton. Construction is ongoing as of 2025 (Kitsap Sun 2025). Expected impact on traffic from the apartment complex would include 121 car trips during morning rush hour and 139 car trips during the afternoon travel peak for a total of 1,936 daily weekday trips (Kitsap Sun 2025).

Reasonably Foreseeable Future Actions – NAVBASE Kitsap-Bangor

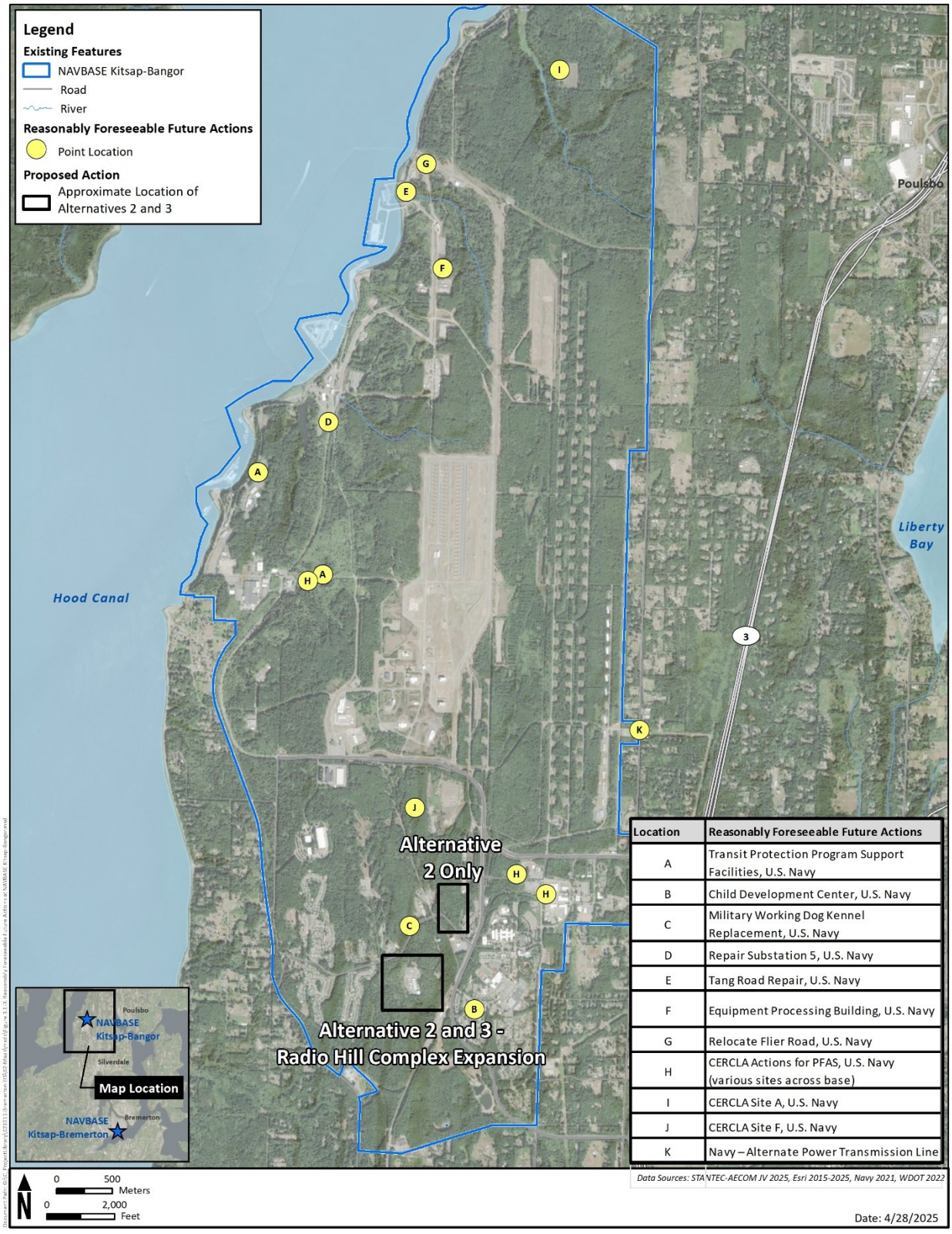
The RFFAs considered for NAVBASE Kitsap-Bangor are summarized in Table 3.1-2, depicted in Figure 3.1-3, and described in further detail below.

Table 3.1-2 Reasonably Foreseeable Future Actions – NAVBASE Kitsap-Bangor

Corresponding Figure Location	*Reasonably Foreseeable Future Actions*	*Time Frame*
A	Navy – Transit Protection Program Support Facilities	2021–2026
B	Navy – Child Development Center	Construction to occur in 2024-2028
C	Navy – Military Working Dog Kennel Replacement	2025
D	Navy – Repair Substation 5	2024–2027
E	Navy – Tang Road Repair	2024–2025
F	Navy – Equipment Processing Building	2025–2027
G	Navy – Relocate Flier Road	2026
H	Navy – CERCLA actions for PFAS	Ongoing, three sites currently undergoing remedial investigation
I	Navy – CERCLA Operable Unit 1 Site A	Remedy construction to begin in 2028

Corresponding Figure Location	*Reasonably Foreseeable Future Actions*	*Time Frame*
J	Navy – CERCLA Operable Unit 2 Site F	Remedy construction to begin in 2032-2033
K	Navy – Alternate Power Transmission Line	2026

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; UXO = unexploded ordnance
Sources: Navy 2019c, Navy 2019d, , Navy 2020a, Navy 2020b, Navy 2022b, Navy 2022c, Navy 2022d



Location	Reasonably Foreseeable Future Actions
A	Transit Protection Program Support Facilities, U.S. Navy
B	Child Development Center, U.S. Navy
C	Military Working Dog Kennel Replacement, U.S. Navy
D	Repair Substation 5, U.S. Navy
E	Tang Road Repair, U.S. Navy
F	Equipment Processing Building, U.S. Navy
G	Relocate Flier Road, U.S. Navy
H	CERCLA Actions for PFAS, U.S. Navy (various sites across base)
I	CERCLA Site A, U.S. Navy
J	CERCLA Site F, U.S. Navy
K	Navy – Alternate Power Transmission Line

Figure 3.1-3 Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

Navy – Transit Protection Program Support Facilities

The project would construct Transit Protection Program (TPP) upland support facilities for berthing TPP blocking vessels and maintaining TPP vessels at NAVBASE Kitsap-Bangor. Diesel fuel marine tanks would be installed upland, connecting the tanks to fueling facilities at the docks area. Other upland facilities to be installed at the site would include an asphalt parking area, an oil-water separator, a sanitary sewer underground storage tank, and a guard station. A Vessel Maintenance Facility (VMF) would be built on a forested site south of the proposed pier site (Navy 2019c). The Navy plans to complete this project in 2026.

Navy – Child Development Center

The Navy would improve the existing Child Development Center (CDC) at NAVBASE Kitsap-Bangor. The Navy would replace the CDC and two Mobile Learning Centers (MLCs) with a larger CDC. The current CDC and the two MLCs would be demolished, and the new CDC would be constructed in the same location. Site preparation would also include site clearing, excavation, grading and tree removal. The new structure would include playgrounds and parking. The area is in an upland area of the installation dedicated to housing and family services. The Navy plans to construct this project between 2024 and 2028 (Navy 2022b and C. Stevenson, pers. comm.).

Navy – Military Working Dog Kennel Replacement

Navy would replace an existing kennel with a new facility on Bangor. The current kennel would be demolished. Site preparation would include site clearing, excavation, and grading. The Navy plans to construct this project in 2025.

Navy – Repair Substation 5

The Navy proposes to repair and construct electrical upgrades of Substation 5 (Navy 2022c). The Navy plans to construct this project in 2024–2027.

Navy – Tang Road Repair

Navy would replace the armoring, upgrade the road, and open the culvert to allow fish passage. Project would ensure the integrity of the road by replacing the armoring and decreasing the hydrostatic pressure resulting from ponding. Project would create a pocket estuary to enhance fish passage and migratory habitat. The Navy plans to complete this project in 2025 (Navy 2022d and Rory Lee, pers. comm.).

Navy – Equipment Processing Building

Navy would construct a single-story equipment processing building, two new storage facilities, and a new parking lot. Site preparation would include tree removal, site clearing, earthwork, grading, and preparation for construction. Paving and site improvements would include driveways, asphalt, and concrete pavement. The Navy plans to construct this project in 2025–2027 (Navy 2020b).

Navy – Relocate Flier Road

Navy would relocate a section of Flier Road (Navy 2019d). The Navy plans to construct this project in 2026.

Navy – Comprehensive Environmental Response, Compensation, and Liability Act Actions for Per- and Polyfluoroalkyl Substances

The Navy is conducting ongoing CERCLA investigation at NAVBASE Kitsap-Bangor. The necessity and magnitude of a remedial action would be based on PFAS delineation and risk evaluation.

Navy – Comprehensive Environmental Response, Compensation, and Liability Act Operable Unit 1 Site A

In 1991, the Navy, EPA, and Ecology signed a Record of Decision (ROD) for Operable Unit 1 Site A to remediate explosives-contaminated groundwater. The parties are starting the process to amend the existing ROD. The existing groundwater treatment system, which extracts and treats explosives-contaminated groundwater, may be phased out and replaced by a bioremediation approach. This could affect soil and subsurface conditions. A pilot study was conducted in 2024. The study results will feed into a Focused Feasibility Study, which may result in a ROD amendment. Remedy construction is anticipated to begin in 2028 and may include advancement of borings for biostimulation injections.

Navy – Comprehensive Environmental Response, Compensation, and Liability Act Operable Unit 2 Site F

In 1994, the Navy, EPA, and Ecology signed a ROD for Operable Unit 2 Site F to remediate explosives-contaminated groundwater. The existing groundwater treatment system extracts and treats explosives-contaminated groundwater. An ongoing pilot study was initiated in 2023. The study results will feed into a Focused Feasibility Study, which may result in a ROD amendment. Remedy construction is anticipated to begin in 2032-2033 and may include advancement of borings for biostimulation injections.

Navy – Alternate Power Transmission Line

The Navy would construct an alternate power transmission line from a commercial electrical power source at Clear Creek Road to a Bangor substation. The project would provide a backup power source for NAVBASE Kitsap Bangor and would include a new transmission line and new equipment. Site preparation would include site clearing, excavation, grading and tree removal. Project is anticipated to occur in 2026.

3.1.2 Effects Analysis

Effects are considered changes to the human environment from the Proposed Action or alternatives that are reasonably foreseeable and can logically be expected to result from the Proposed Action or alternatives. This includes those that occur at the same time and place as the Proposed Action or alternatives and may include effects that are later in time or farther removed in distance from the Proposed Action or alternatives. Each resource defines an ROI for the purpose of effects analysis.

3.1.3 Resources Evaluated in Detail

This EIS reviews potential impacts of the Proposed Action to the following resources: air quality; water resources; geological resources; marine biological resources; cultural resources; American Indian traditional resources; land use and recreation; visual resources; noise; utilities and infrastructure; transportation; marine navigation; public health and safety; hazardous materials and wastes; and socioeconomics.

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3.2 Air Quality

Many factors influence a region's air quality, including the type and amount of pollutants emitted into the atmosphere, the size and topography of the ROI, and the prevailing meteorological conditions.

Most air pollutants originate from human-made sources, including mobile sources (e.g., cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building material and cleaning solvents). Natural sources, such as forest fires and volcanic eruptions, also release air pollutants.

3.2.1 Regulatory Setting

Table 3.2-1 provides a list of the existing regulatory environment for air quality at NAVBASE Kitsap-Bremerton, along with NAVBASE Kitsap-Bangor, where the forge shop and off-site Radio Hill complex expansion are proposed. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.2-1 Regulatory Setting for Air Quality

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
Act to Prevent Pollution from Ships	33 U.S.C. sections 1901-1905
National Primary and Secondary Ambient Air Quality Standards	40 CFR Part 50
Approval and Promulgation of State Implementation Plans	40 CFR Part 52, Subpart WW
Standards of Performance for New Stationary Sources	40 CFR Part 60
National Emission Standards for Hazardous Air Pollutants	40 CFR Part 61
National Emission Standards for Hazardous Air Pollutants for Source Categories	40 CFR Part 63
State Operating Permit Programs	40 CFR Part 70
Protection of Stratospheric Ozone	40 CFR Part 82
Phasedown of Hydrofluorocarbons	40 CFR Part 84
Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines	40 CFR Part 89

Law, Regulation, or Guidance	*Regulatory Citation*
State	
Operating Permit Regulation	WAC Title 173, Chapter 401
Reporting Emissions of Greenhouse Gases	WAC Title 173, Chapter 441
Hydrofluorocarbons	WAC Title 173, Chapter 443
Controls for New Sources of Toxic Air Pollutants	WAC Title 173, Chapter 460
Ambient Air Quality Standards	WAC Title 173, Chapter 476
Ambient Air Quality Standards and Emission Limits for Radionuclides	WAC Title 173, Chapter 480
Emissions Standards and Controls for Sources Emitting Volatile Organic Compounds	WAC Title 173, Chapter 490
Radiation Protection Standards	WAC Title 246, Chapter 221
Radiation Protection, Air Emissions	WAC Title 246, Chapter 247
Local	
Registration; New Source Review; Operating Permits	PSCAA Regulation I, Articles 5, 6, 7
Emission of Air Contaminant: Visual Standard	PSCAA Regulation I, Article 9, Section 9.03
Particulate Matter Emissions Standards	PSCAA Regulation I, Article 9, Section 9.09
Fugitive Dust Control Measures	PSCAA Regulation I, Article 9, Section 9.15
Spray-Coating Operations	PSCAA Regulation I, Article 9, Section 9.16
Nonroad Engines	PSCAA Regulation I, Article 15
Review of Toxic Air Contaminant Sources; Source-Specific Emissions Standards; Asbestos Control Standards	PSCAA Regulation III, Articles 2, 3, 4

Legend: CFR = Code of Federal Regulations; PSCAA = Puget Sound Clean Air Agency; WAC = Washington Administrative Code; U.S.C. = United States Code

The criteria pollutants are a set of common air pollutants that are harmful to human health and the environment and cause property damage (U.S. Environmental Protection Agency [EPA] 2022a). They include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead. Under the Clean Air Act (CAA), the EPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. Washington State has adopted the NAAQS for its state ambient air quality standards (Washington Administrative Code [WAC] Title 173, Chapter 476). If an area meets or is cleaner than the national standard, it is called an attainment area and is designated as attainment or attainment/unclassifiable. Areas that do not meet the national standard are designated nonattainment areas. Nonattainment areas that achieve attainment are designated as maintenance areas. A maintenance area must submit maintenance plans as part of State Implementation Plans for two 10-year periods before becoming a restriction-free attainment area again.

Table 3.2-2 presents the NAAQS for the criteria pollutants, along with their averaging times (i.e., period over which pollutant concentrations are measured for comparison to the NAAQS).

Table 3.2-2 State Adopted Federal Air Quality Standards

Air Pollutant	*Averaging Time [(1)]*	*Federal Primary Standard [(2)]*	*Federal Secondary Standard [(3)]*
CO	1-hour 8-hour	35 ppm 9 ppm	—
NO_2	1-hour Annual	100 ppb 53 ppb	— 53 ppb

Air Pollutant	*Averaging Time [(1)]*	*Federal Primary Standard [(2)]*	*Federal Secondary Standard [(3)]*
PM_{10}	24-hour Annual	150 µg/m^3 —	150 µg/m^3 —
$PM_{2.5}$	24-hour Annual	35 µg/m^3 9 µg/m^3	35 µg/m^3 15 µg/m^3
O_3	8-hour	0.070 ppm	0.070 ppm
SO_2	1-hour 3-hour 24-hour Annual	75 ppb — — —	— 0.5 ppm — —
Pb	Rolling 3-month	0.15 µg/m^3	0.15 µg/m^3

Notes: [(1)] The period over which pollutant concentrations are measured.
[(2)] Primary Standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly.
[(3)] Secondary Standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Legend: — = none; µg/m^3 = microgram per cubic meter; CO = carbon monoxide; NO_2 = nitrogen dioxide; O_3 = ozone; Pb = lead; ppb = parts per billion; ppm = parts per million; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide

Source: EPA 2023a.

The EPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment criteria pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year [tpy]) vary by pollutant, and also depend on the severity of the nonattainment status for the air quality management area in question. EPA classifies Kitsap County as being in attainment for all NAAQS (EPA, 2022a); therefore, a General Conformity evaluation is not required. At the time of this applicability analysis, emissions generated by the construction of the Multi-Mission Dry Dock (M2D2) would not occur within a Federal CAA designated nonattainment or maintenance area for any criteria pollutants. Within these areas, the action is not subject to the General Conformity Rule. It should be noted that Tacoma and parts of Pierce County are in a maintenance area for PM-2.5. As a result, any activities associated with the action that would occur in Tacoma or in Puget Sound within 3 nautical miles of Tacoma would be subject to the General Conformity Rule. These actions could include mooring of ships, staging of equipment, the transport of dredged material or construction waste through the Port of Tacoma, train traffic going through the maintenance area to the Oregon Ridge landfill, or ship/barge traffic within the 3 nautical mile limit.

National standards also exist for hazardous air pollutants (HAPs) for specific source categories regulated under Section 112 of the 1990 CAA Amendments. The WAC Chapter 173, Section 460 also limits ambient air concentrations of approximately 400 toxic air pollutants (TAPs) for stationary sources subject to air permitting, and Regulation III of the Puget Sound Clean Air Agency (PSCAA) regulates sources of TAPs. These HAPs/TAPs are known to cause cancer and other serious health impacts when exposure occurs at sufficient concentrations and durations. Populations most susceptible to exposures include children, the elderly, and those who already suffer from compromised health.

Greenhouse gas (GHG) reporting requirements for facilities that emit 10,000 metric tons per year of GHG reported as carbon dioxide (CO_2) equivalent (11,023 tons per year) or more have been in place in Washington since 2012 (WAC Title 173, Chapter 441). NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-

Bangor are required to report GHG emissions annually. State lawmakers set statewide GHG emission reduction limits for three timeframes: 2030, 2040, and net zero emissions for 2050 (Revised Code of Washington [RCW] 70a.45.020). In March 2020, the governor signed the Zero Emissions Vehicle standard (RCW 70.120A.010 and.050) that supplements Washington's 2005 Clean Car Law and requires automakers to deliver a certain number of zero-emission vehicles to Washington each year. Implementation of this law will serve to reduce vehicle emissions in the state of Washington and help attain the statewide GHG reduction limits, as the transportation sector comprises almost 40 percent of the state's GHG emissions (Ecology 2022).

3.2.2 Affected Environment

The ROI for assessing air quality impacts is Kitsap County, in which both NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor are located, with an additional focus on sensitive populations in the vicinity of the project area that may experience either short- or long-term increases in air pollutant concentrations during Proposed Action construction or operational activities. Figure 3.2-1 identifies susceptible population locations within 1 mile of the project area and the prevailing wind patterns for the area at PSNS & IMF and Figure 3.2-2 depicts these items for NAVBASE Kitsap-Bangor.

3.2.2.1 Existing Conditions

Kitsap County is in attainment for all criteria pollutants (40 CFR 81.32). Table 3.2-3 presents the total criteria pollutant and HAP/TAP emissions for Kitsap County and stationary sources operating at PSNS & IMF as reported by the Navy. PSNS & IMF operates under a Title V permit 21177, issued by the PSCAA for several types of air emissions units, including a radioactive air emissions license from the Washington Department of Health. NAVBASE Kitsap-Bremerton operates under a Synthetic Minor Permit (Registration No. 21138, NOC No. 9608). PSNS & IMF's Title V permit is for stationary sources and fugitive dust emissions such as demolition and construction within the CIA fence line. PSNS & IMF is a major source for HAPs and is subject to multiple National Emission Standards for HAPs, including halogenated solvent cleaning, hard chromium electroplating, radionuclide emissions, and shipbuilding and ship repair (surface coating). Table 3.2-3 presents emissions inventory data for calendar year 2020, the latest year they are available for Kitsap County (as reported through the EPA's National Emission Inventory program), and PSNS & IMF. Many PSNS & IMF stationary source HAP emissions during 2022 resulted from solvent cleaning operations. NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor emissions are presented for 2022, which are the most recent data available.

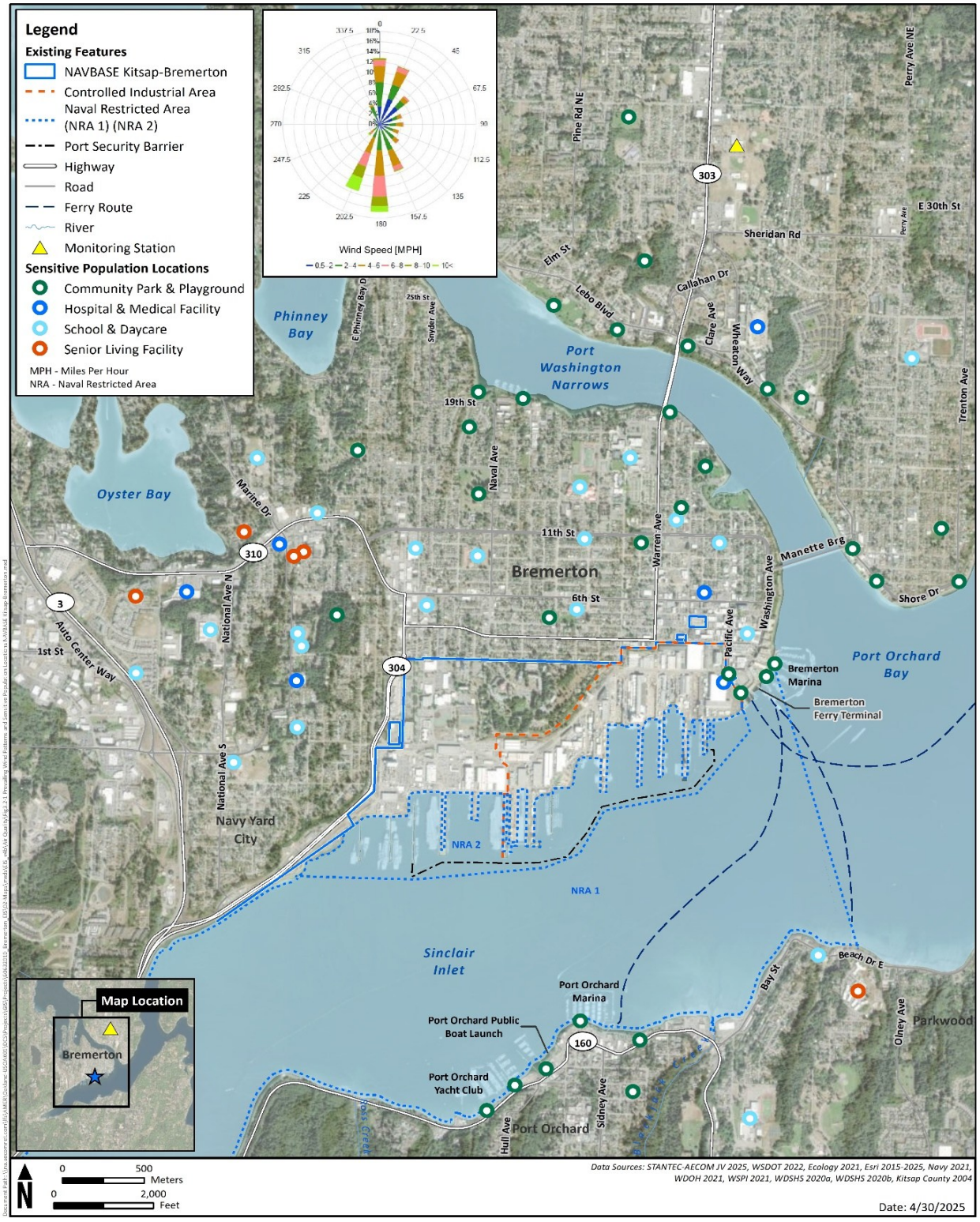

Figure 3.2-1 Prevailing Wind Direction and Sensitive Population Locations NAVBASE Kitsap-Bremerton

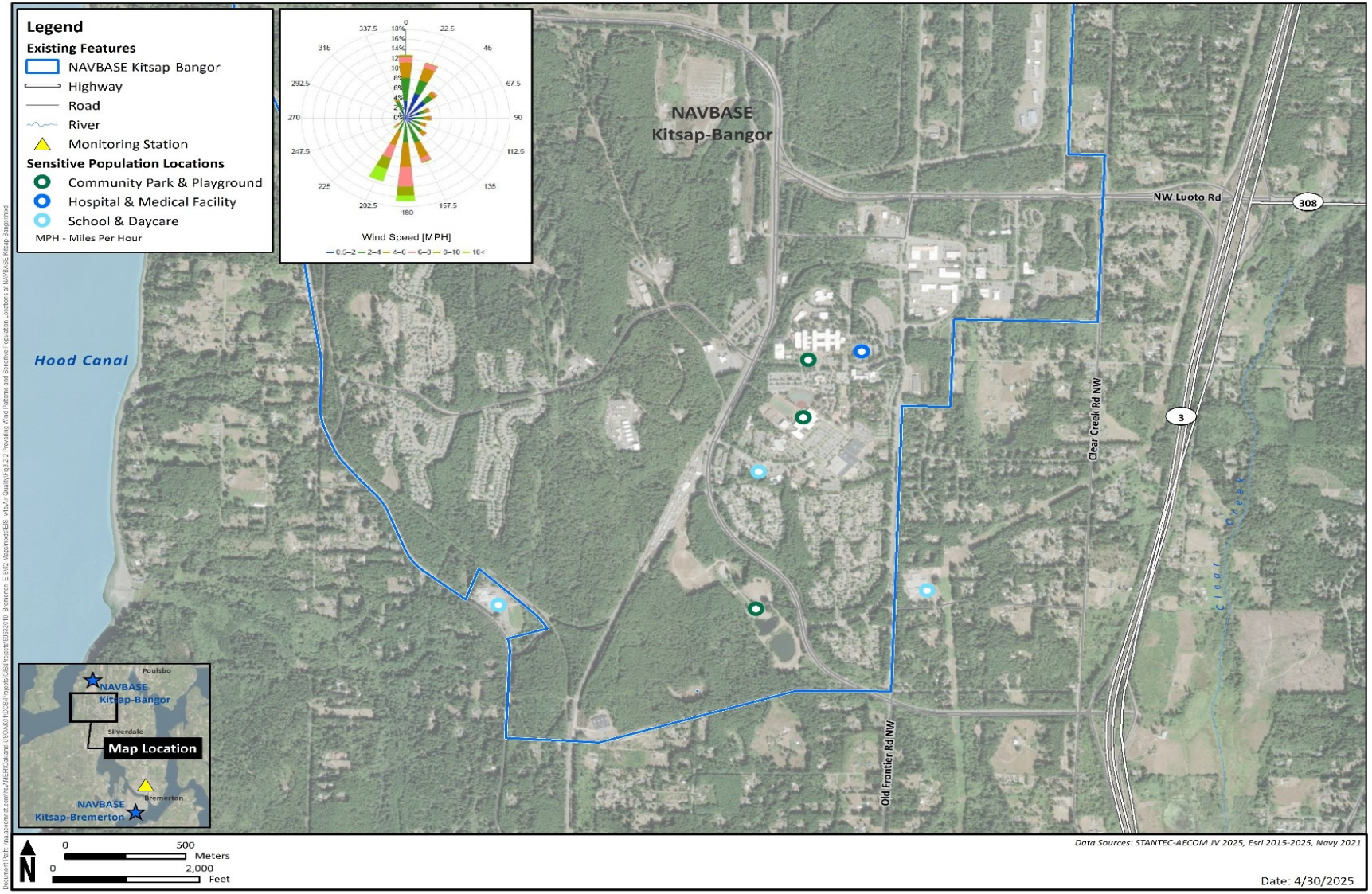

Figure 3.2-2 Prevailing Wind Patterns and Sensitive Population Locations at NAVBASE Kitsap-Bangor

Table 3.2-3 Air Emissions Inventory Data for Kitsap County (2020) and Stationary Source Air Emissions for PSNS & IMF (2022), NAVBASE Kitsap-Bremerton (2023), and NAVBASE Kitsap-Bangor (2023).

Inventory	*VOCs (tpy)*	*CO (tpy)*	*NOx (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*HAPs (tpy)*
Kitsap County Total Emissions (2020)[1]	5,195	25,638	4,395	66	2,155	1,486	1,897
PSNS & IMF Stationary Sources (2022) [2]	173	NR[3]	NR[3]	NR[3]	15.48	2.16	19
NAVBASE Kitsap-Bremerton (2023)[4]	11.0	1.2	42.4	0.2	3.6	3.1	0.6
NAVASE Kitsap-Bangor (2023)[4]	27.1	13.8	14.8	0.2	4.0	1.3	1.5

Notes: [1] Biogenic (vegetation and soil) and wildfire emissions are excluded from the totals.
[2] Stingle, H 2023
[3] NR = not reported. Annual emission inventory requirements define *de minimis* limits for reporting as follows: CO, NOx, SO_2 = 25 tpy for each pollutant; Individual HAP/TAP = 2.5 tpy; Total HAP/TAP = 6.25 tpy.
[4] Hamilton, M. 2025

Legend: CO = carbon monoxide; HAP = hazardous air pollutant; ND = no data available; NO_x = oxides of nitrogen; NR = not reported; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compounds

Sources: EPA 2023b.

Table 3.2-4 provides information on the top two sources of criteria pollutants in Kitsap County, solvent use and mobile sources, based on the EPA's 2020 inventory. Although VOCs and nitrogen oxides other than nitrogen dioxide have no established ambient air quality standards, they are important as precursors to ozone.

Table 3.2-4 Primary Sources of Air Pollution in Kitsap County (2020)

Pollutant	*Source*	*Source Percent of Total (by Pollutant)*
VOCs	Solvent Use	37
	Mobile Sources	33
CO	Mobile Sources	73
	Fuel Combustion	27
NOx	Mobile Sources	89
	Fuel Combustion	11
SO_2	Mobile Sources	47
	Fuel Combustion	51
PM_{10}	Mobile Sources	27
	Fuel Combustion	51
$PM_{2.5}$	Mobile Sources	15
	Fuel Combustion	71

Legend: CO = carbon monoxide; NO_x = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; VOC = volatile organic compounds

Source: EPA 2023a.

The State of Washington operates air monitoring stations throughout the Puget Sound Region for O_3, NO_2, CO, $PM_{2.5}$, and SO_2. The PSCAA operates a station in Bremerton, which measures $PM_{2.5}$ (see Figure 3.2-1). This station monitor is located approximately 2.4 miles north of the waterfront area of PSNS & IMF, across Port Washington Narrows. This station monitors for $PM_{2.5}$; the closest monitoring station for all other pollutants is located in Seattle (Beacon Hill). Table 3.2-5 presents published design values based on the most current ambient monitoring levels (2023) for the region and demonstrates that emission levels are below the most stringent NAAQS. A design value is a statistic that describes the air quality status of a given location relative to the NAAQS. Design values are computed and published annually by EPA's Office of Air Quality Planning and Standards and reviewed in conjunction with the EPA Regional Offices (EPA 2024).

Table 3.2-5 Comparison of 2023 Bremerton-Seattle Region Design Values with NAAQS

Pollutant	*Averaging Time*	*NAAQS*	*Maximum Design Values (Station)*	*Percent of NAAQS*
CO	1-hour	35 ppm	1.6 ppm (Seattle-Beacon Hill)	5
	8-hour	9 ppm	1.3 ppm (Seattle-Beacon Hill)	14
NO_2	1-hour	0.100 ppm	0.042 ppm (Seattle-Beacon Hill)	42
	Annual	0.053 ppm	0.009 ppm (Seattle-Beacon Hill)	17
$PM_{2.5}$	24-hour	35 µg/m^3	17 µg/m^3 (Bremerton – Spruce Avenue)	49
	Annual	9 µg/m^3	5.5 µg/m^3 (Bremerton – Spruce Avenue)	46
O_3	8-hour	0.070 ppm	0.049 ppm (Seattle-Beacon Hill)	70
SO_2	1-hour	0.075 ppm	0.003 ppm (Seattle-Beacon Hill)	4

Note: There are no PM_{10} or lead monitoring sites within PSCAA's jurisdiction, which includes the Bremerton-Seattle Region.

Legend: µg/m^3 =microgram per cubic meter; CO = carbon monoxide; NAAQS = National Ambient Air Quality Standards; NO_2 = nitrogen dioxide; $PM_{2.5}$ = particles with aerodynamic diameters less than or equal to 2.5 micrometers; O_3 = ozone; SO_2 = sulfur dioxide, ppm = parts per million

Source: EPA 2024.

Table 3.2-6 identifies the level of emissions for the seven primary HAPs reported in the National Emission Inventory for the most recent reportable year (2020) and their weighting by percentage relative to total HAP emissions for the year. These HAPs come primarily from mobile sources (EPA 2023b). Additionally, diesel particulate matter overwhelmingly represents the highest potential cancer risk in the Puget Sound area (PSCAA 2011), but diesel particulate matter is not specifically captured in the National Emission Inventory. Instead, it is one of many components of particulate matter that are collectively captured as the criteria pollutants PM_{10} and $PM_{2.5}$. Diesel particulate matter comes from diesel-fueled trucks, cars, buses, construction equipment, rail, marine, and port activities. Particulate matter from wood smoke (a result of burning in woodstoves and fireplaces or outdoor fires) presents the second-highest potential cancer health risk and is also included in PM_{10} and $PM_{2.5}$ data.

Table 3.2-6 Total Kitsap County Emissions from the Top Seven HAPs for 2020

HAP[1]	*Kitsap County Emissions (tpy)*	*Percent of Total HAPs*
Toluene	263	14
Xylenes	168	9
Acetaldehyde	153	8
Formaldehyde	121	6
Ethylene glycol	87	5
2,2,4-trimethylpentane	77	4
Benzene	73	4
Kitsap County Total HAP Emissions[2]	**1,897**	**50**

Notes: [1] HAP emissions represent emissions resulting from human activities and exclude biogenic and wildfire emissions.
[2] Total HAP emissions include all HAPs reported in the 2020 National Emission Inventory, of which the top 7 are a subset representing 50 percent of total HAP emissions.
Legend: < = less than; HAP = hazardous air pollutant; N/A = not applicable; tpy = tons per year
Source: EPA 2023b.

3.2.2.2 Effects Associated with Reasonably Foreseeable Future Actions

This section discusses the air quality changes resulting from the emission of GHGs to the atmosphere. In Kitsap County, the primary GHGs emitted are CO_2, methane, and nitrous oxide. Wildfires have negatively impacted air quality in the region, which is predicted to continue with increasing frequency in future years (May et al. 2018).

For infrastructure projects, GHG emissions are generated in two ways: embodied carbon and operational carbon. Embodied carbon represents the emissions from manufacturing, transportation, installation, maintenance, and disposal of building materials. After an infrastructure project is completed, operational carbon represents the emissions from the infrastructure energy consumption (e.g., buildings and the dry dock/pier operations for PSNS & IMF waterfront infrastructure improvements). Generally, the largest quantity of construction material used is concrete, which contains cement and is one of the largest emitters of CO_2 in the built environment (Carbon Leadership Forum 2020).

GHGs remain in the atmosphere long enough to become well mixed, meaning the amount that is measured in the atmosphere is roughly the same all over the world. To estimate global warming potential (GWP), which is the heat trapping capacity of a gas, the U.S. quantifies GHG emissions using 100-year time frame values and internationally recognized reporting procedures (UNFCCC 2014). CO_2 is assigned a GWP equal to 1 and all other GWPs are expressed relative to CO_2. The carbon dioxide equivalent (CO_2e) is calculated by multiplying the appropriate GWP of a non-CO_2 GHG by the amount of that gas emitted. Table 3.2-7 identifies the primary sources of these GHG emissions in Kitsap County for the year 2020, as reported in the National Emissions Inventory published by the EPA and the Washington State Stationary Source GHGs reported for Kitsap County in 2020. NAVBASE Kitsap-Bremerton and Bangor submit annual GHG reports in accordance with WAC 173-441, and Tables 3.2-8 and 3.2-9 present the GHG emissions from NAVBASE Kitsap-Bremerton and Bangor stationary sources, which include CO_2 generated by a steam plant, for the years 2017–2023, the most recent reporting years available. In 2020, stationary source activities at NAVBASE Kitsap-Bremerton represented 4 percent of

the total GHG emissions for Kitsap County, while stationary sources at NAVBASE Kitsap-Bangor represented 2 percent of the total GHG emissions for Kitsap County

Table 3.2-7 2020 National Emission Inventory Data and 2020 Washington State GHG Inventory Data - GHG Emissions in Kitsap County

GHGs[1]	*Kitsap County 2020 Mobile Source GHG Emissions (tons)[2]*	*Kitsap County 2020 Stationary Source GHG Emissions (tons)[3]*	*Total 2020 GHGs Emissions Reported in Kitsap County*
CO_2	1,104,277	70,713	1,174,990
CH_4	121	34	155
N_2O	26	42	68
Total CO_2e	1,115,215	70,790	1,186,005

Notes: [1] GHG emissions represent emissions resulting from human activities and exclude biogenic and wildfire emissions.
[2] Mobile source emissions from EPA 2020 National Emissions Inventory and includes both on-road and nonroad mobile source emissions.
[3] Kitsap County 2020 stationary source emissions from Washington State GHG Inventory Reporting Program for stationary sources; reportable emissions from two sources: Naval Base Kitsap – Bangor and Naval Base Kitsap – Bremerton. Values shown in tons to be consistent with data from the National Emissions Inventory, which are reported in tons.

Legend: CO_2 = carbon dioxide; CH_4 = methane; CO_2e = carbon dioxide equivalent; GHG = greenhouse gases; N_2O = nitrous oxide

Sources: EPA 2023b and Ecology 2023.

Table 3.2-8 2017–2023 GHG Emissions Reporting for NAVBASE Kitsap-Bremerton

Year	*CO_2e (metric tons [tons])*
2017	46,625 (51,395)
2018	43,240 (47,664)
2019	45,128 (49,745)
2020	44,127 (48,642)
2021	43,005 (47,405)
2022[1]	44,407 (48,950)
2023[2]	41,810 (46,087)

Notes: [1] 2017 – 2020 data from Ecology 2023; 2021 and 2022 data from Hamilton, M.2023.
[2] 2023 data from Hamilton, M. 2025

Legend: CO_2e = carbon dioxide equivalent

Table 3.2-9 2017–2023 GHG Emissions Reporting for NAVBASE Kitsap-Bangor

Year	*CO_2e (metric tons [tons])*
2017	21,875 (24,113)
2018	21,566 (23,772)
2019	19,907 (21,944)
2020	20,092 (22,148)
2021	20,594 (22,701)

Year	*CO_2e (metric tons [tons])*
2022	20,303 (22,380)
2023	19,409 (21,395)

Notes: 2017-2023 data from Hamilton, M. 2025

Legend: CO_2e = carbon dioxide equivalent

In 2021, PSNS & IMF reported 1,002 metric tons (1,105 tons) of CO_2e emissions from natural gas usage from a boiler fueled by natural gas (PSNS & IMF 2022). This, along with many thousands of metric tons of CO2e were cumulatively emitted from all other residential and commercial natural gas combustion within Kitsap County; though individual units were below the reporting threshold of WAC 173-441.

The analysis of CO_2e emissions provided in this EIS is for disclosing the differences between Alternatives 2 and 3 and Alternative 1 (no-action) emissions.

Effects to Air Quality from Reasonably Foreseeable Future Actions

Table 3.2-10 summarizes the potential effects on air quality from RFFAs with a close causal relationship to the project at NAVBASE Kitsap-Bremerton. The RFFAs for NAVBASE Kitsap-Bangor are summarized in Table 3.2-11.

Table 3.2-10 Effects to Air Quality from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Pier 3 Electrical Substation Repair, PSNS & IMF	Reasonably proximate by distance (0.5 miles). The project would repair an electrical substation at Pier 3 at PSNS & IMF and upgrade existing electrical distribution equipment and is planned for construction in 2027, so would occur about the same time activity begins at Pier 2 and M2D2.	Construction would add a minor number of workers, and material deliveries. Some operation of construction equipment could occur, but at a very small scale. Operation of the upgraded electrical system is not anticipated to have impacts on air quality that would interact with or be additive to those from the construction or operation of the Proposed Action.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF and NAVBASE Kitsap-Manchester	Located within the Proposed Action study area and also at NAVBASE Kitsap-Manchester, which is located approximately 5 miles east of PSNS & IMF.	The proposed maintenance activities at NAVBASE Kitsap-Bremerton are planned for 2026-2031. Construction would result in temporary increases in pollutant emissions from use of fuel-burning equipment, and on-road vehicle activities, though these activities are on a small scale. There would be overlap with Proposed Action construction activities and be additive to those from construction of the Proposed Action.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	NAVBASE Kitsap-Manchester, approximately 5 miles east of PSNS & IMF.	This project would occur some distance away from the Proposed Action. Construction would result in temporary increases in air pollutants from fuel-burning equipment, land disturbance, and on-road vehicle activities. Tank farm operations would begin in 2026. Although the old underground storage tanks would be replaced with aboveground tanks, since fuel throughput of the facility is not anticipated to increase from current levels and the fuels stored at the tank farm would continue to have low volatility, no significant increase in operation-related emissions is anticipated.
Navy –SIOP, PSNS & IMF	Located within the study area.	SIOP would involve capital improvements that involve construction-related to existing shipyard elements such as dry docks, infrastructure, and industrial plant equipment at NAVBASE Kitsap-Bremerton. Some SIOP projects could overlap with the Proposed Action and produce additive effects to air quality.
Navy – OU B Marine Source Removal Actions	Located near and within the study area marine environment.	Remedial actions could result in temporary increases in pollutant emissions from fuel-burning equipment and vessels activities. If the remedial actions overlap with the Proposed Action, additive effects to air quality could occur.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of PSNS & IMF.	A CERCLA investigation is ongoing in the Proposed Action area. The initial remedial investigation is scheduled to begin in 2025, with an additional remedial investigation scheduled for 2028. The necessity and magnitude of a remedial action would be based on PFAS delineation and risk evaluation. Remedial actions could result in

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
		emissions from the operation of fossil-fuel burning equipment.
Navy – OU A, OU B Terrestrial, and OU NSC CERCLA Actions for PFAS	Located near and within the study area.	The Navy is conducting ongoing CERCLA investigations at OU A, OU B Terrestrial, and OU NSC. Initial remedial investigations are expected to begin in 2025-2026 with additional investigations between 2029 and 2033. The necessity and magnitude of a remedial action would be based on PFAS delineation and risk evaluation. Remedial investigation and remedial action work will be dependent on access during construction activities associated with the Proposed Action. Remedial actions, if instituted during the same time frame as the Proposed Action, could result in emissions from the operation of fossil-fuel burning equipment.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	Located approximately 1 mile north of the study area.	The repaving of 6th Street between Naval Avenue and Warren Avenue is a minor construction project occurring in 2025. No new air emissions are anticipated to be generated once construction is complete. No additive impacts with the Proposed Action.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Located approximately 1 mile north of the study area.	The Naval Avenue Bicycle and Pedestrian Enhancement is a minor construction project planned to occur in 2026–2027. This would overlap with the Proposed Action in 2027 and be additive with the Proposed Action.
Port of Bremerton – Marina Breakwater Replacement, Port Orchard Marina	Located across the Sinclair Inlet from the study area.	The replacement of the breakwater is ongoing in 2025 and expected to be completed in early 2029. Construction would result in temporary increases in pollutant emissions from construction equipment and on-road vehicle activities. There would be overlap with Proposed Action construction activities and

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
		be additive to those from construction of the Proposed Action.
Private Development – The Beacon and Beacon II	Located approximately 1.5 miles north of the study area.	Construction of a 297-unit apartment complex, expected to begin in 2025. May have short overlap with construction of the Proposed Action and be additive to those from construction of the Proposed Action for the overlapping duration.
Private Development – McWilliams Apartments	Located approximately 5 miles north of the study area.	Construction of a 304-unit apartment complex, ongoing in 2025. May have overlap with construction of the Proposed Action and be additive to those from construction of the Proposed Action for the overlapping duration.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; M2D2 = multi-mission dock; OU = Operable Unit; PFAS = polyfluoroalkyl substances; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; SIOP = Shipyard Infrastructure Optimization Program

Table 3.2-11 Effects to Air Quality from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Transit Protection Program (TPP) Support Facilities	Near the study area (on NAVBASE Kitsap-Bangor).	The project would construct upland support facilities for berthing TPP vessels and would involve minor construction activities that would be complete by 2026. Construction of the forge shop and Radio Hill complex expansion would not begin until 2027, so no overlap would occur. Operations for both the TPP facilities and the Radio Hill complex expansion and the forge shop would be concurrent from 2028 onward.
Navy – Child Development Center	Near the study area (on NAVBASE Kitsap-Bangor).	Demolition of the old Center and construction of a new Center would occur in 2026–2028. This would overlap with construction of the Radio Hill complex expansion and the forge shop. Once constructed, no additional air emissions are anticipated.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Military Working Dog Kennel Replacement	Near the study area (on NAVBASE Kitsap-Bangor).	The demolition of the old kennel and construction of a new kennel is a minor construction project to occur in 2025. No new air emissions are anticipated to be generated once construction is complete. No additive impacts with the Proposed Action.
Navy – Repair Substation 5	Near the study area (on NAVBASE Kitsap-Bangor).	The repair of the substation and construction of electrical upgrades would involve minor construction activity scheduled for 2024–2025. No new air emissions are anticipated to be generated once work is complete. No additive impacts with the Proposed Action.
Navy – Tang Road Repair	Near the study area (on NAVBASE Kitsap-Bangor).	The road repair is a minor construction project scheduled to occur in 2026. This would not overlap with construction of the Radio Hill complex expansion or the forge shop. Once constructed, no additional air emissions are anticipated.
Navy – Equipment Processing Building	Near the study area (on NAVBASE Kitsap-Bangor).	Construction of a single-story equipment processing building, two storage facilities, and a parking lot would require tree removal, site clearing, earthwork, grading and paving. The construction period is planned for 2025–2027 and therefore would overlap with the Radio Hill complex expansion construction and operation and the forge shop construction and operation, with minor additive impacts. Once constructed, no additional air emissions are anticipated. If any equipment processing requires a stationary source, they would undergo permit review before construction of the source.
Navy – Relocate Flier Road	Near the study area (on NAVBASE Kitsap-Bangor).	A small section of Flier Road would be relocated, with construction planned for 2026. This minor construction project would not overlap with

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
		construction of the Radio Hill complex expansion or the forge shop. Once constructed, no additional air emissions are anticipated.
Navy CERCLA Actions for PFAS	Located within the NAVBASE Kitsap-Bangor Radio Hill complex Proposed Action area.	A CERCLA investigation at the Radio Hill complex site determined all PFAS concentrations were below screening levels. Further investigation is not recommended for the Radio Hill site.
Navy – CERCLA Operable Unit 1 Site A	Located approximately 4 miles north of the NAVBASE Kitsap-Bangor Proposed Action area.	No relationship to the Proposed Action and there would be no additive impacts to air resources in the ROI.
Navy – CERCLA Operable Unit 2 Site F	Located within the NAVBASE Kitsap-Bangor Forge Shop Proposed Action area (access road only).	Following an anticipated ROD amendment, remedy construction is planned to begin in 2032-2033 and will include advancement of borings for biostimulation injections.Due to overlap of only a small portion of the forge shop access road, there would be limited relationship to the Proposed Action.
Navy – Alternate Power Transmission Line	Near the study area (on NAVBASE Kitsap-Bangor).	The transmission line is a minor construction project scheduled to occur in 2026. This would not overlap with construction of the Radio Hill complex expansion or the forge shop. Once constructed, no additional air emissions are anticipated.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; TPP = Transit Protection Program; UXO = unexploded ordnance

3.2.3 Environmental Consequences

This analysis estimates direct and indirect emissions associated with the no-action alternative and the action alternatives and compares those emissions with the relevant pollution standards to assess the impact of potential increases in pollutant concentrations. This analysis evaluates short- and/or long-term increases in criteria pollutant and selected HAP emissions in relation to public proximity to the emissions, including sensitive populations and prevailing wind patterns. This analysis quantified GHG emission estimates and referenced those estimates to the most recent GHG emission data for Kitsap County in the context of Washington GHG reduction goals. BMPs are listed in Table 3.2-12 for NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor (also included in Appendix A).

Table 3.2-12 Air Quality Best Management Practices at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
AQ- BREM-1 AQ-BANGOR-1	Impacts from construction activities	Fugitive Dust Reasonable precautions to minimize visible fugitive dust emissions would be implemented, in accordance with PSCAA Regulation I, Article 9, Section 9.15. These include, but are not limited to: 1. The use of control equipment, enclosures, and wet suppression techniques, as practical, and curtailment during high winds; 2. Surfacing roadways and parking areas with asphalt, concrete, or gravel; 3. Treating temporary, low-traffic areas (e.g., construction sites) with water, reducing vehicle speeds, constructing pavement or riprap exit aprons, and cleaning vehicle undercarriages before they exit to prevent the track-out of mud or dirt onto paved public roadways; or 4. Covering or wetting truck loads and providing adequate freeboard to prevent the escape of fugitive dust. Other common aspects of a fugitive dust control plan include: • Use water in the demolition of existing structures, construction operations, and grading or clearing of land. • Apply water on roads. • Whenever feasible, pave ingress and egress points to the site. • Establish and monitor speed limits for project rights-of-way. • Cover all moving, open-bodied trucks transporting materials that can generate fugitive dust. • Promptly remove soil or other “carry out“ materials from roads adjacent to the site. • Install dust screens or wind barriers around construction site. • During earth-moving activities, pre-apply and re-apply water as necessary to maintain soils in a damp condition, limit the amount of exposed areas through planning and timing of project phases, and cover temporarily exposed areas. • Stabilize stockpile materials. • Material stockpiles will be kept far enough offshore to prevent windblown fugitive dust from reaching land. • Cover non-dredge soil/sand/other dust source stockpiles when not in use. • Stockpiles shall have engineered slopes or benches to keep their height as low as possible. • Add or remove soil/sand/other dust sources material from downwind portion of stockpile.	Construction

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
		• For on-site trucks: ▪ Provide water while loading and unloading to prevent fugitive dust. ▪ Maintain at least 6 inches of freeboard on haul vehicles. ▪ Level the height of load. ▪ Limit vehicular speed while traveling on-site. ▪ Cover loads while traveling. Install a gravel pad and grizzly (i.e., rumble grate) at exit. ▪ Reduce carry out with a tire wash or spray system.	
AQ-BREM-2 AQ-BANGOR-2	Impacts from mobile source emissions and construction activities	<u>Mobile Source Emissions</u> • Modify schedules/routes to reduce idling emissions. • Route on-road trucks to avoid areas where sensitive populations are likely to be present (e.g., schools, daycare, nursing homes, residences, playgrounds). • Limit truck idling by posting signage at worksites to serve as a reminder. • To the extent practicable as allowed by space constraints, staging areas/laydown areas shall be located as close as possible to where the construction activity occurs. • Where practicable, require use of newer or higher tier diesel engines during construction. • Require use of ultra low-sulfur diesel fuel. • Perform routine preventive maintenance of diesel engines to minimize emissions. • Where practicable, installing engine exhaust filters, require use of cleaner burning engines, installing diesel oxidation catalysts, and/or use special fuels or fuel additives (e.g., biodiesel) to minimize vehicle emissions.	Construction
AQ-BREM-3 AQ-BANGOR-3	Impacts from demolition	<u>Asbestos Control Standards</u> Asbestos survey, notification, removal, and disposal requirements would be performed in accordance with PSCAA Regulation III, Article 4, including: • Conducting an asbestos survey by an Asbestos Hazard Emergency Response Act building inspector prior to any renovation or demolition activity occurring. • Notifying PSCAA prior to any work on an asbestos project or demolition in accordance with Section 4.03 (Asbestos Notification Requirements = 10 days). • Completing asbestos removal requirements prior to renovation or demolition projects. • Following all required procedures related to training, work practices for friable asbestos removal, and methods of removal for nonfriable asbestos-containing material for asbestos projects.	Construction/ Demolition

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
		• Properly disposing of asbestos-containing waste within 10 days of removal at a waste disposal site authorized to accept such waste, following waste tracking, temporary storage site. • Asbestos cement pipe used on public rights-of-way, public easements, or other places receiving the prior written approval from PSCAA may be buried in place if the pipe is covered with at least 3 feet or more of non-asbestos fill material. All asbestos cement pipe fragments that are 1 linear foot or less and other asbestos-containing waste material shall be disposed of at a waste disposal site authorized to accept such waste.	
AQ-BREM-4 AQ-BANGOR-4	Impacts from GHG	<u>GHG Emissions</u> • To the extent practicable, use propane or electric-powered equipment, including vehicles. • To the extent practicable, use on-site renewable electricity generation and/or grid-based electricity rather than diesel-powered generators or other equipment.	Construction and Operations
AQ-BREM-5 AQ-BANGOR-5	Impacts from GHG and other emissions	<u>GHG and Other Emissions from Operations Power Sources</u> To the extent practicable, support and/or implement resilient energy resources to meet additional power requirements. These actions could include installing photovoltaics on new buildings and existing facilities.	Construction and Operations

Legend: AQ = Air Quality; BMP = best management practices; GHG = greenhouse gases; PSCAA = Puget Sound Clean Air Agency

3.2.3.1 Nature and Type of Effects

This analysis considers whether the Proposed Action would result in any of the following air quality effects:

- Short- and/or long-term changes in ambient concentrations of criteria pollutants or select HAPs and their effects on compliance with ambient air quality standards.
- Risks to populations resulting from the dispersion of air pollutants based on their proximity and prevailing wind patterns.
- Increases in GHG emissions that are not in alignment with Washington's reduction goals as described in Section 3.2.1.

To evaluate potential air quality effects, the Navy identified the following proposed construction and operational activities as primary sources of pollutant emissions:

- Construction activities both upland and in-water generate air emissions through the use of fuel-burning equipment and vessels, these include: clearing and grading; dredging and dredged material processing, and disposal; pile driving and temporary pile removal; placing fill and removal of temporary fill; quay wall construction; pouring concrete material; excavation and excavated material processing for disposal, backfilling, and grading; building, pier, utility,

pavement, and dry dock demolition and new construction; utilities trenching, and excavation and excavated material transport, dewatering and transload for transport to disposal facility.

- Construction workforce commutes via personal vehicles produce short-term effects to air quality.
- Terrestrial activities that generate dust include demolition and trenching activities; transport and management of material activities; activities involving land surface disturbances; excavation, dewatering, and excavated material processing and disposal activities; batch plant operations; activities involving the management of excavated material; activities involving storage of material in piles; and material movement activities.
- New stationary sources of emissions, such as the concrete batch plants during construction, and operational sources such as pumphouse emergency generators, any new stationary sources associated with a forge shop locating at NAVBASE Kitsap-Bangor would all be evaluated per PSCAA Regulation 1, Article 6 (New Source Review). The elevation would determine whether existing air permit(s) would require modifications, or if new permits or other documentation would be required. Long-term changes in air emissions from facility operations post-construction would result from new facilities, including changes in electricity use or fossil fuels.

3.2.3.2 Impact Assessment Methodology

This impact analysis includes a quantitative assessment of air quality impacts from emissions released from the construction and subsequent operational activities associated with the Proposed Action. This analysis quantified, to the extent possible, emissions from the various components comprising each action alternative and summed the emissions in tons per year emitted from the construction activities of all components during each calendar year for an annual total. Refer to Table 2-3 for the components that comprise each action alternative for the data resources used for the air quality analysis.

Kitsap County, where both NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor are located, is in attainment for all the criteria pollutants discussed in Section 3.2.1, which means that the air quality in the region meets or exceeds the NAAQS presented in Table 3.2-1. This analysis evaluates criteria pollutant emissions based on the most recent design values for the region to assess changes in ambient concentrations for criteria pollutants and their effects on compliance with ambient air quality standards.

Section 112 of the CAA addresses National Emission Standards for HAPs (40 CFR part 63) and requires issuance of technology-based standards for major sources and certain area sources. “Major sources” are defined as a stationary source or group of stationary sources that emit or have the potential to emit 10 tons per year or more of a HAP or 25 tons per year or more of a combination of HAPs. An “area source” is any stationary source that is not a major source. As described in Section 3.2.2.1, PSNS & IMF is a major HAP source, while the rest of NAVBASE Kitsap-Bremerton is an area HAP source. If these thresholds are exceeded, then emissions are compared to the regional air emissions to further evaluate significance. Two of the seven HAPs identified in Table 3.2-6 were carried forward for analysis, benzene and formaldehyde. These two pollutants are predominant HAPs emitted by fossil fuel combustion processes, which are the primary sources of emissions associated with the Proposed Action.

Appropriate asbestos abatement measures would be performed on identified asbestos material prior to building demolition and in compliance with PSCAA Regulation III, Article 4, Asbestos Control Standards (refer to BMP AQ-3).

Additionally, this analysis evaluated the overlap between expected locations of pollutant emissions and sensitive receptors to determine exposure potential and how the exposure compares to ambient air quality limits and threshold values. The receptor could be a human, animal, plant, building, or a place of interest. The duration and intensity of pollutant exposure within the adjacent neighborhood of each localized activity area were considered in evaluating air quality impacts from the proposed construction activities. The degree of effect in this analysis is correlated to duration of exposure. A short-term duration lasts from a few minutes to a day or days; for example, transient effects are of brief duration. A long-term duration would occur for a much longer period, on the order of months to years. A marginal effect is limited in extent. Intermittent effects are discontinuous or occasional.

GHG emissions were estimated for both the construction and operation of the Proposed Action alternatives. Sources of direct GHG emissions considered include, but are not limited to, the use of fuel-burning construction equipment; emissions from fuel consumed during operation of the completed docks, including pump operations, machining and repair equipment, maintenance and landscape equipment; terrestrial and in-water vehicles for worker or material transport; and use of portable or permanent backup power generation. Indirect GHG emissions were analyzed through changes in operational emissions associated with utility demand from the new infrastructure (e.g., energy, water, solid waste) and differences in GHG emissions with construction material used under each action alternative. Additionally, embodied carbon estimates to produce concrete for the project have also been estimated, as concrete construction is a significant component of infrastructure improvements.

3.2.3.3 Impact Analysis for Alternative 1: No-Action

Under Alternative 1, the Proposed Action would not occur. The proposed M2D2 would not be built, Pier 4 would not be replaced, and other component actions would not occur. However, the Navy would continue to maintain, repair, and operate existing facilities. Therefore, no impacts would be anticipated with implementation of the no-action alternative.

3.2.3.4 Impact Analysis for Alternative 2 (Preferred Alternative)

Construction-related Impacts at NAVBASE Kitsap-Bremerton

Total direct and fugitive air pollutant emission estimates from proposed construction activities are provided in Table 3.2-13. This includes the construction of the M2D2 at DD3, barge and marine vessel traffic to bring in construction material, install marine components and remove debris (piles, dredged material), transport of the two dry dock caissons via a dedicated vessel from Norfolk, Virginia, stationary sources such as the concrete batch plants, and dust generated from construction equipment and materials movement. The emission estimates also include the expansion and use of the Radio Hill complex expansion area that would be located at NAVBASE Kitsap-Bangor and construction of a forge shop at NAVBASE Kitsap-Bangor. Watering used to reduce fugitive dust emission by 50 percent is reflected in the totals presented in Table 3.2-13; however, BMPs AQ BREM-1 through -5 and AQ BANGOR-1 through -5 would be implemented to further reduce the emissions. Construction activities would comply with applicable BMPs (refer to Appendix A, HAZ MGMT BREM-1 through -6 and HAZ MGMT BANGOR-1 through -6) to minimize potential impacts.

Figure 3.2-3 shows the areas of demolition and construction under Alternative 2 at PSNS & IMF in relation to the sensitive receptors and prevailing winds, which generally blow from the south and southwest. Emissions would result primarily from the operation of engines burning fossil fuels, which are released from equipment exhaust stacks several feet above ground. Fugitive dust at ground level would be generated by on-site trucks transporting material around each worksite, batch plant

operations, and construction equipment operations. Fugitive dust would be minimized to the maximum extent practicable by implementation of BMP AQ BREM-1 and AQ BANGOR-1.

Emissions would occur both at the installation and offsite. Offsite emissions include those that would be generated by marine vessels operating in Puget Sound and further distant as in the case of transport of the two caissons, at offsite material storage and handling locations, and by on-road truck and rail transport of materials and waste to and from offsite storage and handling locations.

Alternative 2 emissions are estimated to be highest in 2028 and 2029, when construction of the M2D2 at DD3 would coincide with the construction of Pier 2.

Table 3.2-13 Alternative 2 (Preferred Alternative) Total Air Pollutant Emission Estimates During Proposed Construction Activities by Year

	tons/year							
Activity by Year	***VOCs***	***CO***	***NO_x***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***	***CO_2e***	***Total HAPs***
2027								
Pier 2	0.70	2.82	13.72	0.01	0.87	0.43	2,146	0.08
Batch Plant Ops	0.34	1.07	5.93	0.01	2.92	0.48	776	0.03
Bremerton Subtotal	**1.04**	**3.89**	**19.65**	**0.02**	**3.79**	**0.91**	**2922**	**0.11**
Radio Hill Expansion	0.20	1.07	2.07	0.00	1.92	0.34	961	0.05
Forge Shop	0.11	0.58	1.12	0.00	0.63	0.13	353	0.01
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.76	5.48	33.67	0.04	0.88	0.86	4,057	0.08
Grand Total	**7.93**	**286.68**	**66.11**	**0.21**	**186.52**	**29.29**	**31,575**	**0.46**
2028								
Pier 2	0.70	2.54	12.83	0.01	0.60	0.40	2,159	0.06
M2D2 @ DD3	0.72	2.32	12.54	0.01	4.83	0.85	3,329	0.07
Bremerton Subtotal	**1.42**	**4.85**	**25.37**	**0.03**	**5.43**	**1.25**	**5,488**	**0.13**
Radio Hill Expansion	0.20	1.07	2.07	0.00	1.92	0.34	961	0.05
Forge Shop	0.11	0.58	1.12	0.00	0.63	0.13	353	0.01
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.74	5.40	33.15	0.04	0.87	0.84	3,994	0.08
Total	**8.29**	**287.56**	**71.30**	**0.22**	**188.15**	**29.61**	**34,077**	**0.48**
2029								
Pier 2	0.03	0.13	0.44	0.00	0.22	0.04	144	0.01
M2D2 @ DD3	4.05	15.77	73.99	0.09	13.63	3.42	16,953	0.43
Bremerton Subtotal	**4.08**	**15.90**	**74.43**	**0.09**	**13.85**	**3.45**	**17,097**	**0.44**
Radio Hill Expansion	0.20	1.07	2.07	0.00	1.92	0.34	961	0.05
Forge Shop	0.11	0.58	1.12	0.00	0.63	0.13	353	0.01
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.39	4.33	26.61	0.03	0.70	0.68	3,207	0.07
Total	**10.60**	**297.53**	**113.84**	**0.27**	**196.41**	**31.65**	**44,900**	**0.77**
2030								
M2D2 @ DD3-Bremerton	**8.06**	**36.21**	**169.72**	**0.17**	**15.27**	**5.70**	**25,549**	**1.30**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	0.88	2.74	16.80	0.02	0.44	0.43	2,024	0.04
Total	**13.77**	**314.61**	**196.11**	**0.34**	**195.01**	**33.18**	**50,853**	**1.56**
2031								
M2D2 @ DD3-Bremerton	1.90	8.46	41.67	0.04	6.16	1.57	4,856	**0.31**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21

	tons/year							
Activity by Year	***VOCs***	***CO***	***NO_x***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***	***CO_2e***	***Total HAPs***
Materials Movement - Barges	1.00	3.10	19.03	0.02	0.50	0.48	2,293	0.05
Total	**7.73**	**287.22**	**70.30**	**0.21**	**185.96**	**29.11**	**30,429**	**0.56**
2032								
M2D2 @ DD3	1.90	8.46	41.67	0.04	6.16	1.57	4,855	0.31
Bremerton Subtotal	**1.90**	**8.46**	**41.67**	**0.04**	**6.16**	**1.57**	**4,855**	**0.31**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	0.99	3.08	18.94	0.02	0.50	0.48	2,282	0.05
Total	**7.72**	**287.20**	**70.21**	**0.21**	**185.96**	**29.11**	**30,417**	**0.56**
2033								
M2D2 @ DD3	1.79	7.82	38.58	0.04	2.90	1.19	4,855	0.30
Bremerton Subtotal	**1.79**	**7.82**	**38.58**	**0.04**	**2.90**	**1.19**	**4,855**	**0.30**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.02	3.16	19.38	0.02	0.51	0.49	2,335	0.05
Total	**7.63**	**286.63**	**67.56**	**0.21**	**182.70**	**28.74**	**30,470**	**0.56**
2034								
M2D2 @ DD3	1.79	7.82	38.58	0.04	2.90	1.19	4,505	0.30
Bremerton Subtotal	**1.79**	**7.82**	**38.58**	**0.04**	**2.90**	**1.19**	**4,505**	**0.30**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.76	5.47	33.57	0.04	0.88	0.85	4,046	0.08
Caisson Delivery	0.32	1.00	6.16	0.01	0.16	0.16	751	0.02
Total	**8.70**	**289.95**	**87.91**	**0.23**	**183.24**	**29.25**	**32,583**	**0.61**
2035								
M2D2 @ DD3	0.42	1.94	7.17	0.008	0.57	0.31	2,256	0.07
Bremerton Subtotal	**0.42**	**1.94**	**7.17**	**0.01**	**0.57**	**0.31**	**2,256**	**0.07**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.69	5.24	32.20	0.04	0.84	0.82	3,880	0.08
Total	**6.94**	**282.84**	**48.96**	**0.20**	**180.72**	**28.18**	**29,416**	**0.36**
2036								
Pier 4 Demolition	0.01	0.05	0.12	0.00	0.13	0.02	73	0.00
M2D2 @ DD3	0.18	0.72	3.36	0.003	0.18	0.11	594	0.02
Bremerton Subtotal	**0.19**	**0.77**	**3.49**	**0.00**	**0.31**	**0.13**	**667**	**0.02**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.66	5.17	31.75	0.04	0.83	0.81	3,825	0.08
Total	**6.68**	**281.59**	**44.83**	**0.19**	**180.44**	**27.99**	**27,772**	**0.31**
2037								
Pier 4 Demolition	1.00	4.05	18.85	0.02	0.96	0.60	3,478	0.11
M2D2 @ DD3	1.33	5.87	28.51	0.027	3.14	0.99	3,595	0.22
Bremerton Subtotal	**2.33**	**9.92**	**47.35**	**0.05**	**4.10**	**1.59**	**7073.43**	**0.32**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.76	5.47	33.62	0.04	0.88	0.86	4,051	0.08
Total	**8.92**	**291.05**	**90.57**	**0.24**	**184.28**	**29.50**	**34,405**	**0.62**
2038								
Pier 4 Demolition	0.75	3.14	14.30	0.02	0.70	0.45	2,629	0.09
M2D2 @ DD3	1.33	5.87	28.51	0.027	3.14	0.99	3,595	0.22
Bremerton Subtotal	**2.08**	**9.01**	**42.81**	**0.04**	**3.84**	**1.44**	**6224.32**	**0.30**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.80	5.60	34.39	0.04	0.90	0.88	4,143	0.09
Total	**8.71**	**290.26**	**86.79**	**0.23**	**184.04**	**29.37**	**33,648**	**0.60**

	tons/year							
Activity by Year	***VOCs***	***CO***	***NO_x***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***	***CO_2e***	***Total HAPs***
2039								
Pier 4 Demolition	0.78	3.23	14.74	0.02	0.71	0.47	2,709	0.09
Bremerton Subtotal	**0.78**	**3.23**	**14.74**	**0.02**	**0.71**	**0.47**	**2,709**	**0.09**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.80	5.60	34.39	0.04	0.90	0.88	4,143	0.09
Total	**7.41**	**284.49**	**58.72**	**0.21**	**180.91**	**28.40**	**30,133**	**0.38**
2040								
Pier 4 Construction-Bremerton	**0.55**	**2.02**	**9.78**	**0.01**	**0.52**	**0.33**	**1,852**	**0.05**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Total	**5.38**	**277.67**	**19.38**	**0.16**	**179.82**	**27.38**	**25,132**	**0.26**
2041								
Pier 4 Construction-Bremerton	**1.11**	**4.09**	**19.87**	**0.02**	**1.06**	**0.67**	**3,761**	**0.11**
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	3,329	0.21
Total	**5.94**	**279.75**	**29.47**	**0.17**	**180.36**	**27.72**	**7,090**	**0.32**

Legend: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; DD = dry dock; HAP = hazardous air pollutant; M2D2 = multi-mission dock; N/A = not applicable; NO_x = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; VOC = volatile organic compounds

Alternative 2 would generate emissions of criteria pollutants and GHGs from in-water and upland construction activities. This analysis assumes a maximum of 1,000 construction workers per shift would be on-site during the construction period. Emissions for each component may span multiple calendar years. Emissions are presented by calendar year and are further categorized by activity location, and the location, duration, and intensity of emissions are evaluated in respect to the adjacent sensitive receptors. Construction activities within the project area would fluctuate throughout the day and day-to-day at both upland and in-water construction areas. Wind conditions would vary throughout the day while construction sources would move around the site such that potential pollutant concentration increases would not persist in any single location, with the exception of up to two batch plants, one on-land and one located on a barge.

The largest contributor of air emissions would be from the operation of mobile sources, which includes on-road vehicles and marine vessels. On-road vehicle emissions would be generated by two primary sources, commuting construction workers and on-road trucks involved in the hauling of materials to and from construction areas. Of these, the largest contributor to emissions would be the commuting workers, which have been evaluated at their peak level of two shifts of 1,000 construction workers per day for all years as a conservative assumption and also does not account for any growth in the use of electric vehicles by workers over time. Materials movement using barges would be the predominant use of marine vessels, and this activity would mostly be confined to Puget Sound as materials are moved to and from the transload site and as suitable dredged material is transported to the Elliot Bay disposal site (there would also be two barge trips to deliver a caisson from Norfolk, VA to Bremerton, WA with each trip being separated by months or years).

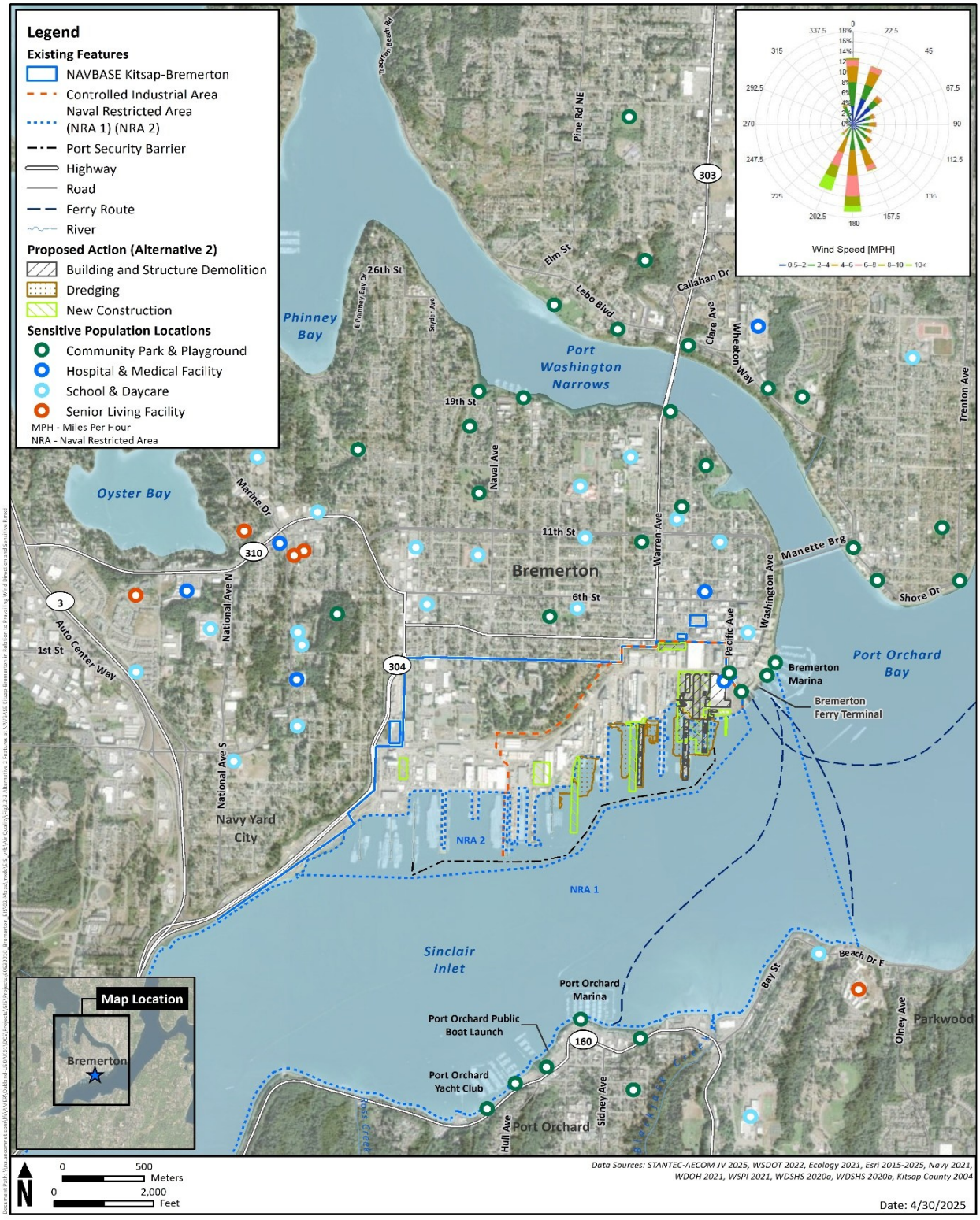

Figure 3.2-3 Alternative 2 Features at NAVBASE Kitsap-Bremerton in Relation to Prevailing Wind Direction and Sensitive Population Locations

Fugitive dust at ground level would be generated by on-site trucks transporting material, batch plant operations, and construction equipment activity. Implementation of BMP AQ BREM-1 would reduce visual fugitive dust emissions, and the calculations for fugitive dust assume a 50 percent reduction from watering.

As described in Section 3.3.3.4, *Groundwater*, most construction activity at NAVBASE Kitsap-Bremerton would occur within OU-B Terrestrial and would encounter soil and groundwater contamination. To minimize potential hazards to human health and the environment from organic vapors, excavated material would be stockpiled and dewatered, tested, and treated as necessary as described in construction BMPs (WATER MGMT BREM-1 through 3). Other sources of airborne contaminated dust include general ground disturbances from equipment and vehicle operations and materials transfer. Procedures to address contaminated dust are included in BMPs in Appendix A (HAZ MGMT BREM-1 through -6). These BMPs comply with LUCs and excavation management plan requirements (NAVFAC NW 2020).

The nearest locations of sensitive/public receptors at NAVBASE Kitsap-Bremerton include a park along the eastern edge of the shipyard (located approximately 0.11 mile east of the nearest construction activity), Peninsula Community Health Services located approximately 0.32 miles north of DD3, Our Lady Star of the Sea Catholic School, and Kiwanis Park located approximately 0.5 mile north of Mooring A. Ambient air concentrations of pollutants would increase during the construction period at these locations, as well as north of the construction area at Pier 2, due to the direction of the prevailing winds. The ground level emissions are anticipated to be quickly entrained downwind with potential impacts similar to vehicle emissions along a highway, where concern would be focused on sensitive receptors immediately adjacent (within 0.25-mile) to the emission sources. No increase in human health risks is expected from HAP exposure in areas where sensitive receptors and/or the public are located. As the ambient criteria pollutant concentrations in the region are well below the NAAQS (see Table 3.2-5), anticipated air quality changes from construction activities are not expected to interfere with the attainment of NAAQS. Any activities related to the Action occurring in a nonattainment or maintenance area would require preparation of a General Conformity Applicability Analysis to verify that emissions would be exempt from general conformity. This analysis would be necessary if materials are shipped through the Hampton Roads Virginia ozone maintenance area or the Tacoma $PM_{2.5}$ maintenance areas, as examples.

Most of the marine activity would involve barge transit of goods in Sinclair Inlet to deliver material to the construction sites and transport of construction debris and excavated/dredged material to Seattle-area terminals for subsequent delivery to approved disposal locations by rail (see Figure 3.13-2). A smaller amount of marine activity would involve the transport of suitable dredged material to the Elliot Bay disposal site. Due to the geography and roadway network leading to the NAVBASE Kitsap-Bremerton, transport of material and debris by barge is generally deemed more efficient and free-flowing than transport by truck on local roads. Additionally, the barge routes are farther removed from the upland locations of sensitive receptors. Emissions would be transient, as vessels would come and go, and emissions would disperse in various directions depending on wind conditions. Anticipated air quality changes from marine vessel usage are not expected to interfere with the attainment of NAAQS, as the ambient criteria pollutant concentrations in the region are well below the NAAQS. No increase in human health risks to sensitive receptors and/or the public are expected from HAP exposure in the areas where barges and other marine traffic will transit. Vessel activity at the transload facility is estimated at approximately seven trips per day. Vessel emissions would be reduced upon arrival at the facility for

offloading/onloading of the barge as the barge will be secured at the dock and not need maneuvering until the return trip is initiated. This low level of activity is not anticipated to cause an increase in human health risks from HAP exposure in the contractor multi-use area.

Construction-related Impacts at NAVBASE Kitsap-Bangor

Emissions at NAVBASE Kitsap-Bangor during construction would include the expansion and use of the Radio Hill complex expansion and the construction of the forge shop. Emissions would result primarily from the operation of engines burning fossil fuels, which are released from equipment exhaust stacks several feet above ground. Fugitive dust at ground level would be generated by on-site trucks and construction equipment operations. Fugitive dust would be minimized to the maximum extent practicable by implementation of BMP AQ BANGOR-1, -2, and -3.

Figure 3.2-4 shows these areas and wind patterns for NAVBASE Kitsap-Bangor. The nearest sensitive receptors to the Radio Hill complex expansion would be a Navy housing area located approximately 0.25 miles west and another Navy housing area located approximately 0.28 miles southeast. The nearest sensitive receptors to the forge shop location would be a Navy housing area located approximately 0.5 miles southwest and another Navy housing area located approximately 0.8 miles to the southeast. Winds in this area also primarily come from the south and southwest. Thus, ambient air concentrations of pollutants would not be anticipated to increase at the sensitive receptor locations during the construction period. Operations at the Radio Hill complex expansion, including moving of materials and equipment between NAVBASE Kitsap-Bangor and PSNS & IMF, would occur throughout the duration of construction and beyond. The Radio Hill complex expansion would be sized to accommodate functions that would be impacted by construction of M2D2 at a 1:1 ratio. Two new buildings with employee parking areas would be constructed (employee building and work building). The construction at NAVBASE Kitsap-Bangor would result in the loss of forested areas, which store carbon.

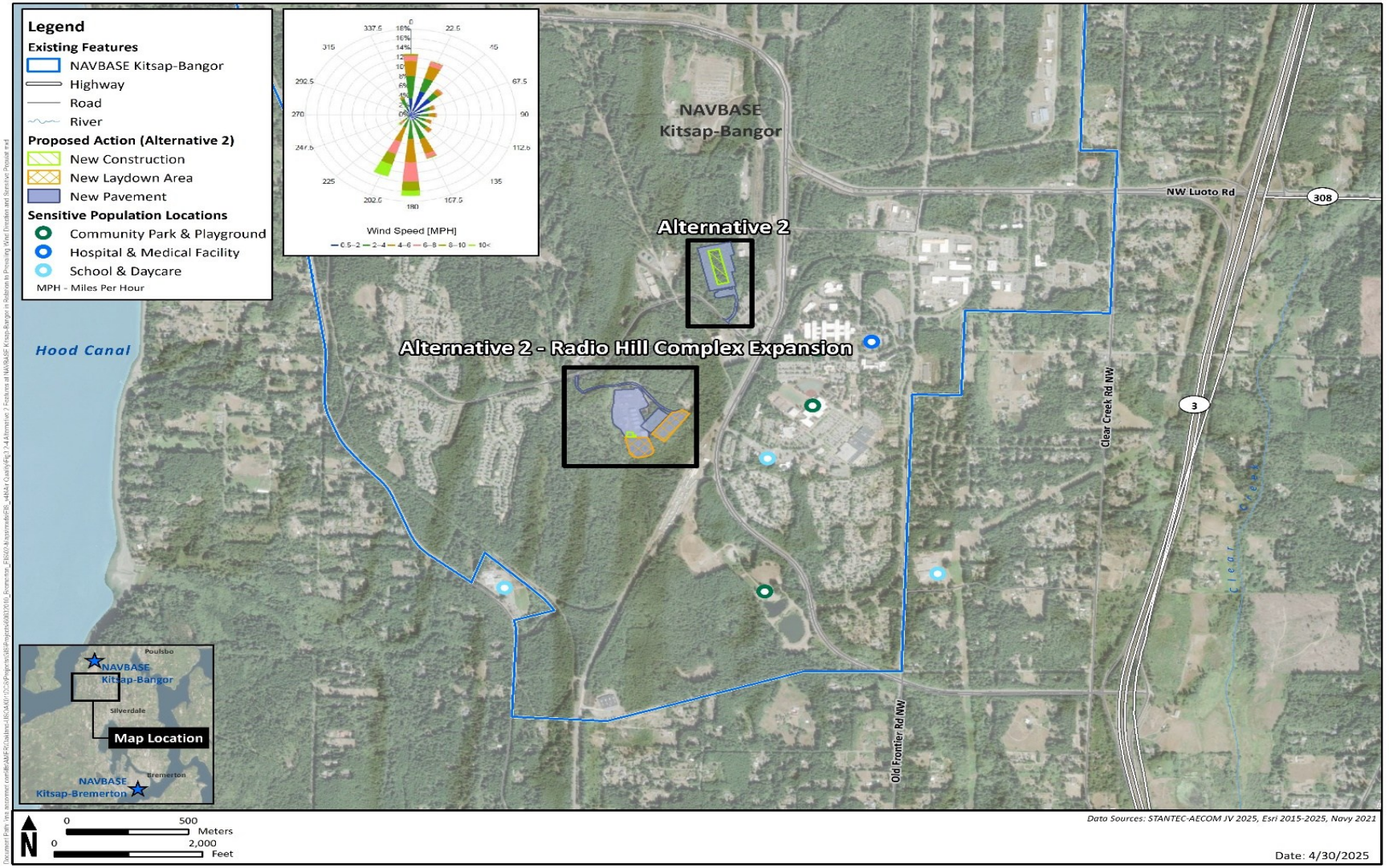

Figure 3.2-4 Alternative 2 Features at NAVBASE Kitsap-Bangor in Relation to Prevailing Wind Direction and Sensitive Population Locations

GHG Emissions from Construction Under Alternative 2 (Preferred Alternative)

GHG emissions generated from the Proposed Action activities contribute to the global atmosphere, regardless of the specific location within the ROI that they are produced. Alternative 2 would generate direct GHG emissions of approximately 472,901 tons of CO_2e between 2027 and 2041. Indirect GHG emissions would be generated by the short-term increase in utilities demand (e.g., water and energy – see Section 3.11, Utilities), from embodied carbon in the use of construction material, and debris from both construction and demolition activities sent to local landfills that will eventually decompose and release methane. The construction material used in the largest quantity would be concrete to construct project features like the M2D2 at DD3. Embodied carbon from concrete production is estimated at 110,427 tons of CO_2e. The total direct and indirect CO_2e generated between 2027 and 2041 is estimated to be 583,328 tons, and the average annual indirect and direct GHG emissions are estimated at 41,666 tons of CO_2e. This would be the equivalent of adding 7,604 cars to local roadways, each driving the national average of 13,476 miles per year. In order to estimate a worst-case scenario, these emissions do not consider the increased use of vehicles and equipment that are electric or use other forms of renewable energy. In 2020, Washington passed the Climate Commitment Act to curtail GHG emissions to below 1990 levels at an increasing rate over three decades. The legislation has a goal to ultimately achieve net zero emissions and a reduction to 95 percent below 1990 levels by 2050, with interim reduction goals of 45 percent by 2030 and 70 percent by 2040 based on the 1990 baseline. The GHGs that would be emitted as a result of the 14 to 15 years of construction would be a net increase but would not be sufficient to significantly impede the state's effort towards these goals. These GHG emissions will cease upon conclusion of the construction project.

Application of BMPs AQ BREM-1 through -5 would reduce emissions and thus reduce pollutant concentrations at any given location. Emissions under Alternative 2 would not cause a violation of the NAAQS or increase health risks to the public.

Operation-related Impacts at NAVBASE Kitsap-Bremerton Under Alternative 2 (Preferred Alternative)

The facilities constructed under Alternative 2 would be more energy efficient than the buildings they would replace. Indirect GHG emissions would result from changes in energy use from other systems, but an overall decrease in indirect GHG emissions is expected because new systems would be more energy efficient. Additionally, the Clean Energy Transformation Act of 2019 requires Washington's electric utilities to eliminate carbon emissions from their energy resources by 2045 and requires these utilities to be GHG neutral by 2030 through offsets, energy efficiencies, carbon reduction investments, or payments funding low income assistance. As a result, GHG emissions from utility power use at NAVBASE Kitsap-Bremerton would be significantly reduced in future years compared to current power utility emissions. Impacts from operational activities emissions under Alternative 2 would not cause a violation of the NAAQS or increase health risks to the public as compared to the No Action Alternative.

Operation-related Impacts at NAVBASE Kitsap-Bangor Under Alternative 2 (Preferred Alternative)

Operation-related impacts for Alternative 2 would increase at NAVBASE Kitsap-Bangor due to the use of the Radio Hill Complex Expansion that would replace the existing Laydown Area at NAVBASE Kitsap-Bremerton. Use of the Radio Hill complex expansion would begin in 2027-2028 and continue after all construction is completed as a permanent operational change. Emissions from the Radio Hill complex operations are not expected to be substantially different from those occurring presently at the NAVBASE Kitsap-Bremerton Laydown Area. The only operational change is an increase in on-road traffic for trucks delivering materials stored at NAVBASE Kitsap-Bangor to NAVBASE Kitsap-Bremerton for use.

The forge shop would also be an operational increase at NAVBASE Kitsap-Bangor. The emissions would not be different from those occurring at NAVBASE Kitsap-Bremerton but would simply change locations. This location change would require NAVBASE Kitsap-Bangor to submit an air permit construction application to PSCAA and would revise their source permit. Operational emissions under Alternative 2 would not cause a violation of the NAAQS or increase health risks to the public as compared to the No Action Alternative.

Impacts from Reasonably Foreseeable Future Actions under Alternative 2 (Preferred Alternative)

Reasonably foreseeable future actions are listed in Tables 3.2-10 (for NAVBASE Kitsap-Bremerton) and 3.2-11 (for NAVBASE Kitsap Bangor). Some of these actions could have minor additive impacts from construction and demolition activities if they take place concurrently with Alternative 2. These impacts would not cause a violation of the NAAQS or increase health risks to the public as compared to the No Action Alternative.

3.2.3.5 Impact Analysis for Alternative 3

Construction-related Impacts at NAVBASE Kitsap-Bremerton

Total direct and fugitive air pollutant emission estimates from proposed construction activities under Alternative 3 are provided in Table 3.2-14. This includes the construction of the M2D2 at Mooring A, barge and marine vessel traffic to bring in construction material, install marine components and remove debris (piles, dredged material), transport of the dry dock caissons via a dedicated vessel from Norfolk, Virginia, stationary sources such as the concrete batch plants located on barges off Mooring A, the expansion and use of the Radio Hill complex expansion at NAVBASE Kitsap-Bangor, and dust generated from construction equipment and materials movement. Watering used to reduce fugitive dust emission by 50 percent is reflected in the totals below; however, BMPs AQ BREM-1 through -5 would be implemented to further reduce the emissions presented in Table 3.2-14.

Figure 3.2-5 shows the areas where demolition and construction, occur under Alternative 3 at PSNS & IMF in relation to the sensitive receptors and prevailing winds, which generally blow from the south and southeast; Figure 3.2-6 shows these areas and wind patterns for NAVBASE Kitsap-Bangor. As described for Alternative 2, emissions at the site would result primarily from the operation of engines burning fossil fuels, which are released from equipment exhaust stacks several feet above ground. Fugitive dust at ground level would be generated by on-site trucks transporting material around the worksite, batch plant operations, and construction equipment operations. Fugitive dust would be managed as described under Alternative 2. Management of contaminated soil and dust would be the same as described under Alternative 2.

As described under Alternative 2, emissions would occur both at the installation and offsite.

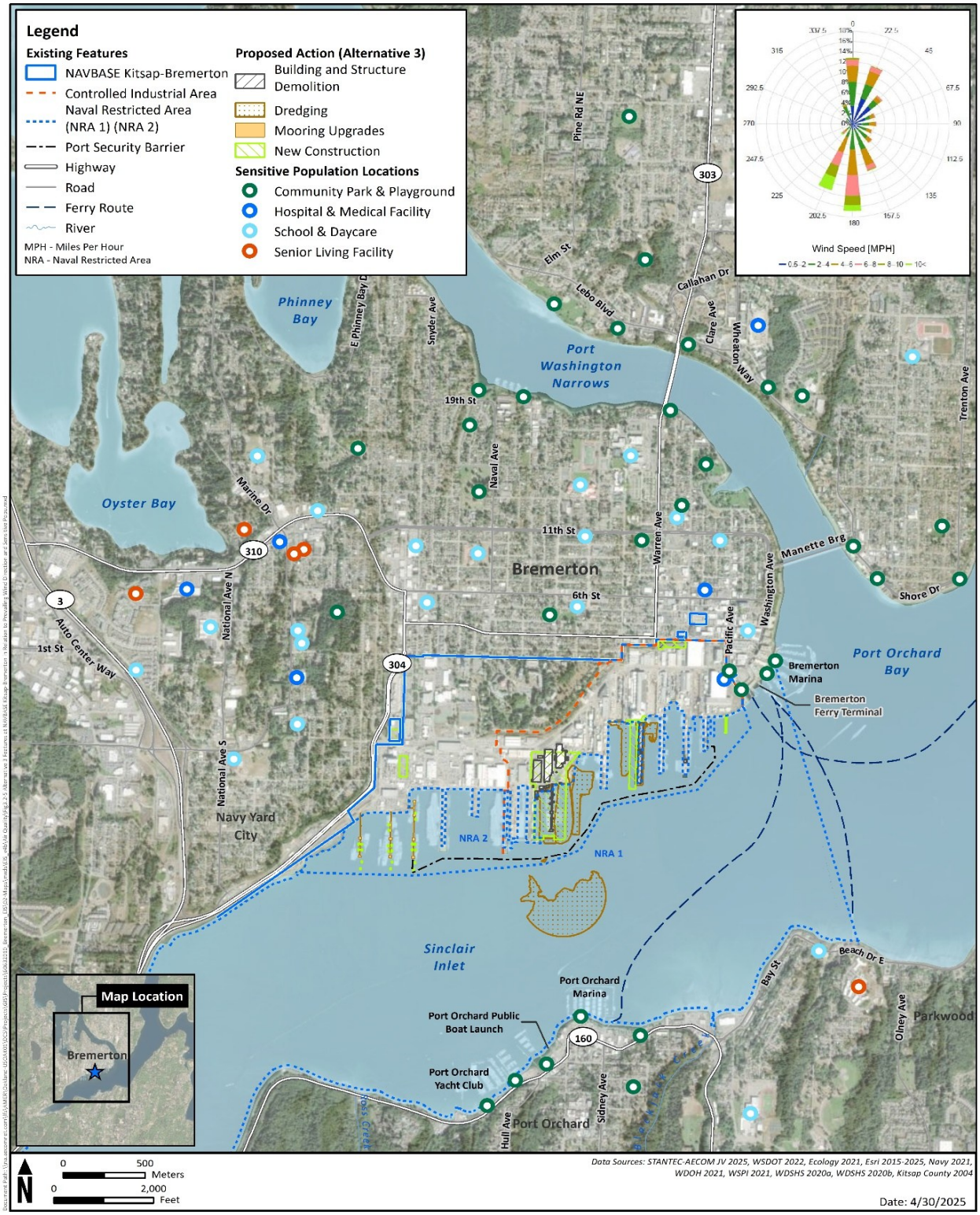

Figure 3.2-5 Alternative 3 Features at NAVBASE Kitsap-Bremerton in Relation to Prevailing Wind Direction and Sensitive Population Locations

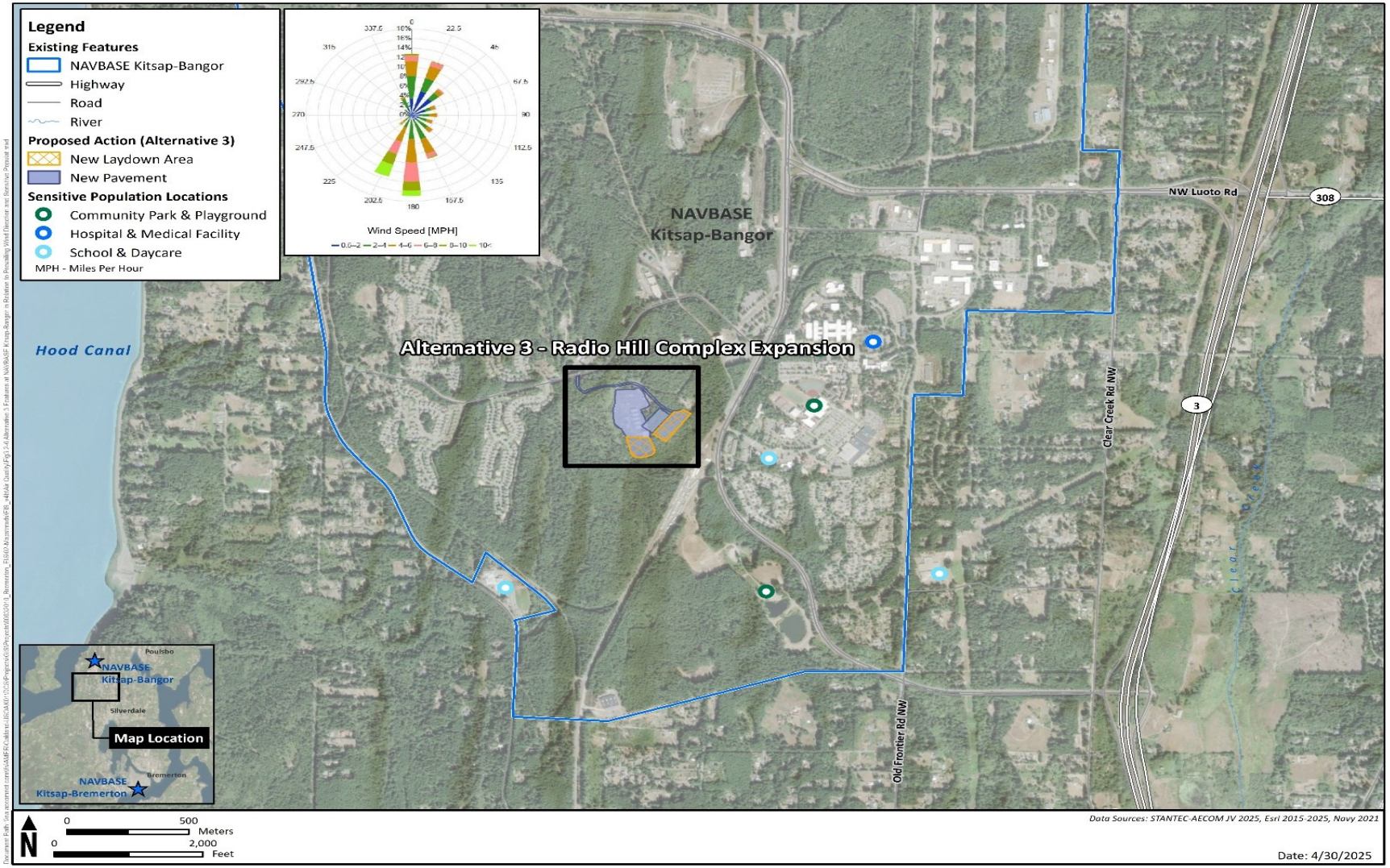

Figure 3.2-6 Alternative 3 Features at NAVBASE Kitsap-Bangor in Relation to Prevailing Wind Direction and Sensitive Population Locations

Under Alternative 3, emissions are estimated to be highest in 2028 during demolition of the existing Mooring A and associated building demolition, followed by 2035 during construction of the M2D2 at Mooring A. Construction activity would be concentrated primarily in the center of PSNS & IMF around Mooring A. Construction activities would fluctuate throughout the day, and day-to-day at both upland and in-water construction areas, with the exception of the barge-based concrete batch plant that would remain at the same in-water location south of Mooring A. The nearest sensitive/public receptors are Kiwanis Park and Our Lady Star of the Sea Catholic School located 0.5 mile north of Mooring A. Ambient air concentrations of pollutants would increase during the construction period at these locations due to the prevailing wind patterns. Impacts would be similar to those described for Alternative 2.

Construction-related Impacts at NAVBASE Kitsap-Bangor

The expansion and use of the Radio Hill complex expansion at NAVBASE Kitsap-Bangor and changes to ambient air quality at nearby sensitive receptors would be the same as described under Alternative 2. Figure 3.2-6 shows the areas where demolition construction occur under Alternative 3 at NAVBASE Kitsap-Bangor in relation to the sensitive receptors and prevailing winds, as described under Alternative 2.

GHG Emissions from Construction Under Alternative 3

Direct GHG emissions from all years of construction under Alternative 3 (2027 to 2041) would be slightly lower than those from Alternative 2, at 465,337 tons of CO_2e. Indirect GHG emissions would be generated from the same sources described for Alternative 2. Alternative 3 would require approximately twice as much concrete to construct the M2D2 at Mooring A and embodied carbon from concrete production is estimated at 225,146 tons of CO_2e. However, Alternative 3 would involve less demolition than Alternative 2, thereby sending less construction and demolition debris to local landfills to eventually decompose and release methane. The total direct and indirect GHGs emitted between 2027 and 2041 would be an estimated maximum of 690,483 tons of CO_2e, or an average of 46,032 tons of CO_2e per year under Alternative 3. This would be the equivalent of adding 8,401 cars to local roadways, each driving the national average of 13,476 miles per year. Similar to the impact from GHGs under Alternative 2, the GHGs that will be emitted as a result of the 14 to 15 years of construction would be a net increase but would not be sufficient to significantly impede the state's effort towards these goals. These GHG emissions will cease upon conclusion of the construction project.

The analysis of CO_2e emissions in this EIS is for disclosing the differences between Alternatives 2 and 3 and Alternative 1 (no-action) emissions. For Alternatives 2 and 3, construction activities would increase GHG emissions as compared to Alternative 1. GHG emissions from construction under Alternative 3 would be approximately 18 percent higher than for Alternative 2.

Table 3.2-14 Alternative 3 Total Air Pollutant Emission Estimates from Proposed Construction Activity By Year

	tons/year							
Activity by Year	***VOCs***	***CO***	***NO_x***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***	***CO_2e***	***Total HAPs***
2027								
M2D2 @ Mooring A	0.70	2.23	12.32	0.01	6.29	1.02	1,725	0.06
Mooring A Demolition	0.36	1.38	6.71	0.01	0.24	0.21	1,118	0.04
Bremerton Subtotal	**1.07**	**3.61**	**19.03**	**0.02**	**6.53**	**1.23**	**2,844**	**0.10**
Radio Hill Expansion	0.20	1.07	2.07	0.00	1.92	0.34	961	0.05
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23281	0.21

	tons/year							
Activity by Year	***VOCs***	***CO***	***NO_x***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***	***CO_2e***	***Total HAPs***
Materials Movement - Barges	1.76	5.48	33.67	0.04	0.88	0.86	4,057	0.08
Total	**7.86**	**285.82**	**64.37**	**0.21**	**188.64**	**29.47**	**31,142**	**0.44**
2028								
M2D2 @ Mooring A	1.53	5.11	27.50	0.03	14.54	1.75	7,256	0.16
Mooring A Demolition	0.36	1.38	6.71	0.01	0.24	0.21	1,118	0.04
Bremerton Subtotal	**1.90**	**6.49**	**34.21**	**0.04**	**14.78**	**1.96**	**8,374**	**0.19**
Radio Hill Expansion	0.20	1.07	2.07	0.00	1.92	0.34	961	0.05
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.74	5.40	33.15	0.04	0.87	0.84	3,994	0.08
Total	**8.66**	**288.61**	**79.03**	**0.23**	**196.87**	**30.19**	**36,610**	**0.53**
2029								
M2D2 @ Mooring A-Bremerton	**3.75**	**16.58**	**80.07**	**0.07**	**10.99**	**2.58**	**12,060**	0.58
Radio Hill Expansion	0.20	1.07	2.07	0.00	1.92	0.34	961	0.05
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.39	4.33	26.61	0.03	0.70	0.68	3,207	0.07
Total	**10.18**	**297.64**	**118.35**	**0.26**	**192.90**	**30.65**	**39,509**	**0.90**
2030								
M2D2 @ Mooring A-Bremerton	**2.73**	**13.37**	**61.97**	**0.05**	**5.89**	**1.97**	**7,335**	0.57
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	0.88	2.74	16.80	0.02	0.44	0.43	2,024	0.04
Total	**8.44**	**291.77**	**88.37**	**0.22**	**185.63**	**29.45**	**32,639**	**0.82**
2031								
M2D2 @ Mooring A-Bremerton	**1.47**	**5.91**	**30.32**	**0.03**	**4.81**	**1.13**	**4,383**	0.17
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.00	3.10	19.03	0.02	0.50	0.48	2,293	0.05
Total	**7.30**	**284.66**	**58.95**	**0.20**	**184.61**	**28.67**	**29,956**	**0.43**
2032								
M2D2 @ Mooring A-Bremerton	0.62	2.26	11.48	0.01	0.70	0.44	2,331	0.08
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	0.99	3.08	18.94	0.02	0.50	0.48	2,282	0.05
Total	**6.44**	**281.00**	**40.02**	**0.19**	**180.49**	**27.98**	**27,893**	**0.34**
2033								
M2D2 @ Mooring A-Bremerton	0.52	1.81	9.71	0.01	1.76	0.42	1,841	0.05
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.02	3.16	19.38	0.02	0.51	0.49	2,335	0.05
Total	**6.36**	**280.63**	**38.68**	**0.18**	**181.57**	**27.97**	**27,456**	**0.31**
2034								
M2D2 @ Mooring A-Bremerton	0.66	2.43	12.02	0.01	2.02	2.00	2,515	0.07
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.76	5.47	33.57	0.04	0.88	0.85	4,046	0.08
Caisson Delivery	0.32	1.00	6.16	0.01	0.16	0.16	751	0.02
Total	**7.57**	**284.56**	**61.35**	**0.21**	**182.36**	**30.07**	**30,593**	**0.38**
2035								
M2D2 @ Mooring A-Bremerton	1.52	6.85	32.23	0.03	2.67	1.05	4,668	0.23
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.69	5.24	32.20	0.04	0.84	0.82	3,880	0.08
Total	**8.04**	**287.75**	**74.02**	**0.22**	**182.81**	**28.92**	**31,829**	**0.52**

	tons/year							
Activity by Year	***VOCs***	***CO***	***NO_x***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***	***CO_2e***	***Total HAPs***
2036								
M2D2 @ Mooring A-Bremerton	0.74	2.93	13.13	0.02	1.98	0.59	3,219	0.09
Pier 4 Demolition	0.01	0.05	0.12	0.00	0.13	0.02	73	0.00
Bremerton Subtotal	**0.75**	**2.98**	**13.25**	**0.02**	**2.11**	**0.61**	**3,292**	0.10
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.66	5.17	31.75	0.04	0.83	0.81	3,825	0.08
Total	**7.24**	**283.80**	**54.60**	**0.20**	**182.24**	**28.47**	**30,398**	**0.39**
2037								
Pier 4 Demolition	1.00	4.05	18.85	0.02	0.96	0.60	3,478	0.11
Bremerton Subtotal	**1.00**	**4.05**	**18.85**	**0.02**	**0.96**	**0.60**	**3,478**	0.11
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.76	5.47	33.62	0.04	0.88	0.86	4,051	0.08
Total	**7.59**	**285.18**	**62.06**	**0.21**	**181.14**	**28.51**	**30,810**	**0.40**
2038								
Pier 4 Demolition	0.75	3.14	14.30	0.02	0.70	0.45	2,629	0.09
Bremerton Subtotal	**0.75**	**3.14**	**14.30**	**0.02**	**0.70**	**0.45**	**2,629**	0.09
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.80	5.60	34.39	0.04	0.90	0.88	4,143	0.09
Total	**7.38**	**284.39**	**58.29**	**0.21**	**180.90**	**28.38**	**30,053**	**0.38**
2039								
Pier 4 Construction	0.78	3.23	14.74	0.02	0.71	0.47	2,709	0.09
Bremerton Subtotal	**0.78**	**3.23**	**14.74**	**0.02**	**0.71**	**0.47**	**2,709**	0.09
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.80	5.60	34.39	0.04	0.90	0.88	4,143	0.09
Total	**7.41**	**284.49**	**58.72**	**0.21**	**180.91**	**28.40**	**30,133**	**0.38**
2040								
Pier 4 Construction	0.55	2.02	9.78	0.01	0.52	0.33	1,852	0.05
Bremerton Subtotal	**0.55**	**2.02**	**9.78**	**0.01**	**0.52**	**0.33**	**1,852**	0.05
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Materials Movement - Barges	1.80	5.60	34.39	0.04	0.90	0.88	4,143	0.09
Total	**7.18**	**283.27**	**53.77**	**0.20**	**180.72**	**28.26**	**29,276**	**0.35**
2041								
Pier 4 Construction - Bremerton	1.11	4.09	19.87	0.02	1.06	0.67	3,761	0.11
Onroad Vehicles	4.83	275.66	9.60	0.15	179.30	27.05	23,281	0.21
Total	**5.94**	**279.75**	**29.47**	**0.17**	**180.36**	**27.72**	**27,041**	**0.32**

Legend: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; HAP = hazardous air pollutant; M2D2 = multi-mission dry dock; NO_x = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; VOC = volatile organic compounds

Operation-related Impacts at NAVBASE Kitsap-Bremerton Under Alternative 3

Operation-related impacts under Alternative 3 are the same as impacts under Alternative 2, with the exception that there would be no changes to the forge shop under Alternative 3. As with Alternative 2, operational emissions under Alternative 3 would not cause a violation of the NAAQS or increase health risks to the public as compared to the No Action Alternative.

Impacts from Reasonably Foreseeable Future Actions under Alternative 3

Reasonably foreseeable future actions are listed in Tables 3.2-10 (for NAVBASE Kitsap-Bremerton) and 3.2-11 (for NAVBASE Kitsap Bangor). As with Alternative 2, some of these actions could have minor additive impacts from construction and demolition activities if they take place concurrently with Alternative 3. These impacts would not cause a violation of the NAAQS or increase health risks to the public as compared to the No Action Alternative.

Operation-related Impacts at NAVBASE Kitsap-Bangor Under Alternative 3

Operation-related impacts under Alternative 3 are the same as impacts under Alternative 2 with the exception that there would be no changes to the forge shop under Alternative 3. As with Alternative 2, operational emissions under Alternative 3 would not cause a violation of the NAAQS or increase health risks to the public as compared to the No Action Alternative.

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3.3 Water Resources

Water resources include groundwater, surface water, marine waters, floodplains, wetlands, and shorelines (Table 3.3-1). Section 3.4 addresses bathymetry and marine sediment, Section 3.5 addresses water-based wildlife and vegetation, Section 3.11 addresses drinking water, and Section 3.15 addresses contaminated sites.

Table 3.3-1 Definition and Description of Water Resources

Water Resource	*Definition/Description*
Groundwater	Groundwater is water that flows or seeps downward and saturates soil or rock, supplying springs and wells. Groundwater is important for ecological functions and is used for water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition.
Surface Water	Surface water resources generally consist of wetlands, lakes, ponds, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale.
Marine Waters	Marine waters typically include estuaries, waters seaward of the historic height of tidal influence, and offshore high salinity waters (i.e., the ocean). Marine water quality can be described as the chemical and physical composition of water (e.g., temperature, acidity [pH], turbidity, dissolved oxygen levels, salinity, contaminant concentrations) as affected by natural conditions and human activities. Marine waters may also include areas within a National Marine Sanctuary requiring an action proponent to avoid adverse water quality impacts to prevent damage to resources within the sanctuary.
Floodplains	Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality and are often home to a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the descending overland flow reaches the main water body. Floodplain boundaries are most often defined in terms of frequency of inundation, that is, the 100- and 500-year flood.

Water Resource	*Definition/Description*
	Floodplain delineation maps are produced by the FEMA and provide a basis for comparing the locale of the Proposed Action to the floodplains.
Wetlands	Wetlands are jointly defined by EPA and USACE as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Wetlands that are considered "Waters of the United States" are currently regulated by the USACE under Section 404 of the CWA. As defined in *Revised Definition of "Waters of the United States"* (USACE and EPA 2023a) and *Revised Definition of ''Waters of the United States''; Conforming* (USACE and EPA 2023b) jurisdictional waters of the U.S. include (1) traditional navigable water, the territorial seas, or an interstate water; (2) impoundments of waters otherwise defined as waters of the U.S. with a continuous surface connection to those waters; (3) tributaries of waters identified in 1 or 2; (4) wetlands adjacent to or with a continuous surface connection to waters of the U.S.; or (5) intrastate lakes and ponds that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to waters of the U.S. Adjacent means having a continuous surface connection.
Shorelines	Shorelines are located along marine waters, brackish estuaries, or freshwater bodies. Physical dynamics affecting shorelines include tidal influences, channel movement and hydrological systems, flooding or storm surge areas, and erosion and sedimentation. Shoreline ecosystems are vital habitat for multiple life stages of many fish, birds, reptiles, amphibians, and invertebrates. Different shore zones provide different kinds and levels of habitat, and when aggregated, can significantly influence the life cycle of shoreline utilizing organisms. Organic matter that is washed onto the shore, or "wrack," is an important component of the shoreline ecosystems, providing habitat for invertebrates, and providing soil and organic matter and nutrients to both the upland terrestrial communities and aquatic ecosystems.

Legend: CWA = Clean Water Act; EPA = U.S. Environmental Protection Agency; FEMA = Federal Emergency Management Agency; U.S. = United States; USACE = U.S. Army Corps of Engineers

3.3.1 Regulatory Setting

Table 3.3-2 provides a description of the existing regulatory environment for water resources at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, Washington. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.3-2 Regulatory Setting for Water Resources

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
Clean Water Act Sections 303(d), 305(b) and most recent 304(a) list	40 CFR Part 130
Clean Water Act Section 307	40 CFR Part 129
Clean Water Act Section 316(b)	40 CFR Part 125
Clean Water Act Section 320, National Estuary Program	33 U.S.C. Section 1330
Clean Water Act Sections 401-402	40 CFR Part 121
Clean Water Act Section 404	40 CFR Parts 230-233
Energy Independence and Security Act	P.L. 110-140 Section 438, 42 U.S.C. Ch 152
Rivers and Harbors Act of 1899	Section 10, 33 U.S.C. 403
USACE Section 10 and Section 404 Regulatory Program	33 CFR Parts 320-332
Coastal Zone Management Act	16 U.S.C. Section 1451, 15 CFR Part 930
Submerged Lands Act (as amended)	43 U.S.C. Sections 1301-1315 (2002)

Law, Regulation, or Guidance	*Regulatory Citation*
Federal compliance with pollution control standards	Executive Order 12088
Protection of Wetlands	Executive Order 11990
Floodplain Management	Executive Order 11988
DMMP	U.S. Army Corps of Engineers
State	
Washington State Water Resources Act of 1971	Chapter 90.54 RCW
Shoreline Management Act of 1971	Chapter 90.58 RCW
Water Code	Chapter 90.03 RCW
Water Pollution Control	Chapter 90.48 RCW
Sediment Management Standards	Chapter WAC 173-204
Water Quality Standards for Groundwaters of the State of Washington	Chapter WAC 173-200
Water Quality Standards for Surface Waters of the State of Washington	Chapter WAC 173-201A and 40 CFR 131.45
Minimum Standards for Construction and Maintenance of Wells	Chapter WAC 173-160

Legend: CFR = Code of Federal Regulations; DMMP = Dredged Material Management Program; EO = Executive Order; P.L. = Public Law; RCW = Revised Code of Washington; U.S. = United States; USACE = U.S. Army Corps of Engineers; U.S.C. = United States Code; WAC = Washington Administrative Code

Ecology sets pollution limits for groundwater and surface water to help protect and regulate the quality of water in Washington State. The surface water quality standards apply to designated uses, such as fishing, swimming, drinking water supply, and aquatic life; numeric and narrative water quality criteria; and policies to protect waters from future pollution. Designated uses, sometimes called beneficial uses, describe uses specified in water quality standards for each water body or water body segment.

According to the CWA, each state must develop Total Maximum Daily Loads (TMDLs) for all the waters identified on their Section 303(d) list of impaired waters. A TMDL is a numerical value that represents the highest amount of a pollutant a surface water body can receive and still meet the water quality standards. A water body can be deemed impaired if water quality analyses conclude water quality standards have been exceeded. An impaired water body may have a reduced ability to support biological function and/or could cause harm to users of the water body. Washington State classifies water bodies by water quality according to the following quality assessment Categories (with definitions provided):

- Category 1 – Waters that meet tested standards for clean waters
- Category 2 – Waters of concern (some evidence of a problem but not enough to require a water quality improvement [WQI] project)
- Category 3 – Insufficient data
- Category 4A – Waters that have a TMDL in place and actively implemented
- Category 4B – Waters that have a pollution control program
- Category 4C – Waters impaired by a non-pollutant (impaired by causes that cannot be addressed by a TMDL)
- Category 5 – Polluted waters that require a TMDL or other WQI (303(d) list)

3.3.2 Affected Environment

The ROI for water resources includes the terrestrial project footprint at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, Sinclair Inlet, watersheds of direct tributaries to Sinclair Inlet, Clear Creek

watershed, the Open-Water Dredged Disposal Site route out to Elliott Bay, and Contractor Multi-Use Site(s) Route. Water resources in the ROI are shown in Figure 3.3-1 and Figure 3.3-2 and the Open-Water Dredged Disposal Site Route are shown in Figure 2-4. The following discussions provide a description of the existing conditions for water resources at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor. This section addresses chemical and physical water quality parameters that affect the suitability of the water body as habitat for marine organisms and other beneficial uses.

3.3.2.1 Existing Conditions

NAVBASE Kitsap-Bremerton

Groundwater

Groundwater tends to flow from the higher areas of NAVBASE Kitsap-Bremerton toward the dry docks and Sinclair Inlet (NAVFAC NW 2022). Continuous pumping of groundwater is required in the vicinity of the dry docks to relieve hydrostatic pressures that would otherwise tend to lift and potentially damage the dry docks (Navy et al. 2004). The water table throughout most of central and eastern portions of OU B Terrestrial (Figure 3.3-3) is significantly lowered by the operation of these dry dock drainage relief systems (see Section 3.15 for details on OUs). Operation of the drainage relief systems adds to the natural rate of intrusion of seawater into the soil along the shoreline in the vicinity of the dry docks. Most shallow groundwater and intruding seawater in central and eastern portions of OU B Terrestrial pass through the dry dock drainage relief systems before being discharged to Sinclair Inlet (Navy et al. 2004). Miscellaneous wastes included in fill materials used in developing the shoreline area; historical spills and releases from industrial operations and aboveground/underground storage tanks; and offsite, upgradient sources of contaminants have resulted in soil and groundwater contamination in OU A, OU B Terrestrial, OU C, OU D, and OU NSC (Figure 3.3-3) (NAVFAC NW 2022). As identified in the OU B Terrestrial ROD, remedial actions to address contamination at NAVBASE Kitsap-Bremerton include restricting groundwater use to monitoring purposes (Navy et al. 2004). Groundwater at NAVBASE Kitsap-Bremerton is not used for and is prohibited from being used as a drinking water source.

The City of Bremerton provides public drinking water from several surface water sources and production wells located outside the project area (City of Bremerton 2020). Category II critical aquifer recharge areas are located in the project area along the western portion of NAVBASE Kitsap-Bremerton (Kitsap County 2021).

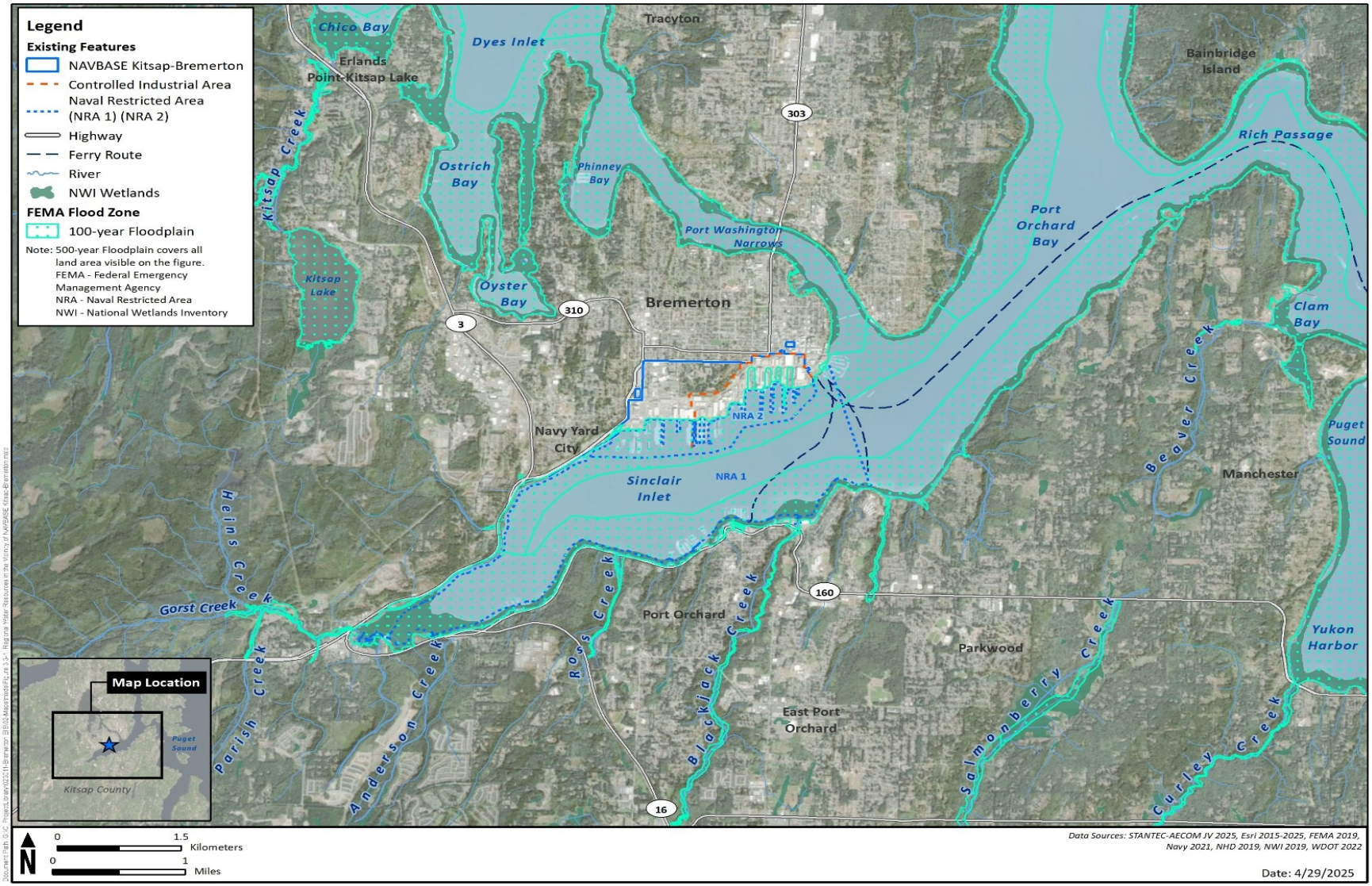

Figure 3.3-1 Regional Water Resources in the Vicinity of NAVBASE Kitsap-Bremerton

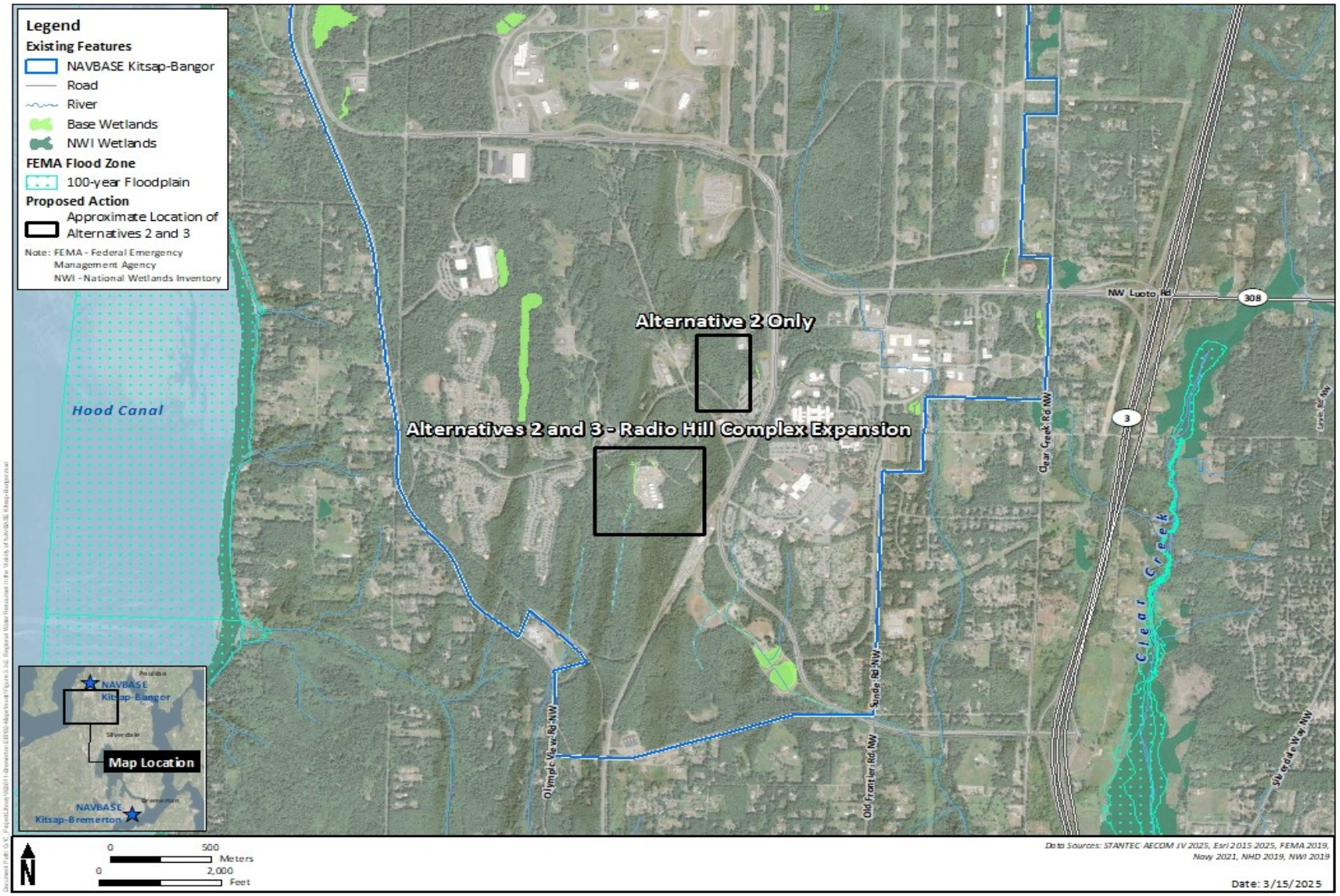

Figure 3.3-2 Regional Water Resources in the Vicinity of NAVBASE Kitsap-Bangor

Surface Waters

Within NAVBASE Kitsap-Bremerton project area, there are no streams, natural ponds, lakes, or wetlands (Figure 3.3-1). The installation is situated along Sinclair Inlet, which is part of the larger central basin of the Puget Sound that includes the major urban and industrial areas, Seattle, Tacoma, and Bremerton. Sediment and other contaminants transported by runoff from these lands have impacted water quality and sediment quality in Sinclair Inlet (see *Marine Waters* and Section 3.4, respectively, for additional details).

OU B Terrestrial remedial actions to address contamination at NAVBASE Kitsap-Bremerton included installing pavement or clean soil cover with vegetation in unpaved areas and repairing existing damaged pavement to limit potential infiltration of water into site soil (Navy et al. 2004). OU NSC remedial actions to address contamination at NAVBASE Kitsap-Bremerton include maintaining site pavement and cleaning storm drains (Navy et al. 1996). As a result, the majority of NAVBASE Kitsap-Bremerton is covered by impervious surfaces.

There is an extensive stormwater collection system with numerous stormwater outfalls that all drain to Sinclair Inlet (Navy 2018a). PSNS & IMF is currently operating under the 1994 National Pollutant Discharge Elimination System (NPDES) Industrial Discharge Permit Number WA0002062 (administratively extended since 1998) for discharge to Sinclair Inlet (EPA Region 10 1994) and 2020 State Waste Discharge Permit (SWDP) Number ST0007374 for discharges of wastewater to the City of Bremerton Wastewater Treatment Plant via the sanitary sewer (Ecology 2020). The Navy is working with EPA Region 10 to renew the NPDES Industrial Discharge Permit Number WA0002062. Operational discharges from the existing outfalls at NAVBASE Kitsap-Bremerton will comply with the new permit once it is issued.

Marine Waters

The project area is within and adjacent to Sinclair Inlet (Figure 3.3-1), which is part of the Puget Sound. The Puget Sound has been designated as one of 28 estuaries of National Significance under CWA Section 320. The goal of the National Estuary Program is to attain and maintain water quality in designated estuaries that will assure protection of public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife and allows recreational activities in and on the water. For the Puget Sound area, the Action Agenda for Puget Sound – the Comprehensive Conservation and Management Plan under CWA Section 320 – is a key regional plan (Puget Sound Federal Task Force 2022). The Action Agenda for Puget Sound charts the course to recovery of the nation's largest estuary by volume and complements and incorporates the work of many partners from around Puget Sound to describe regional strategies and specific actions needed to recover Puget Sound (Puget Sound Partnership 2023a).

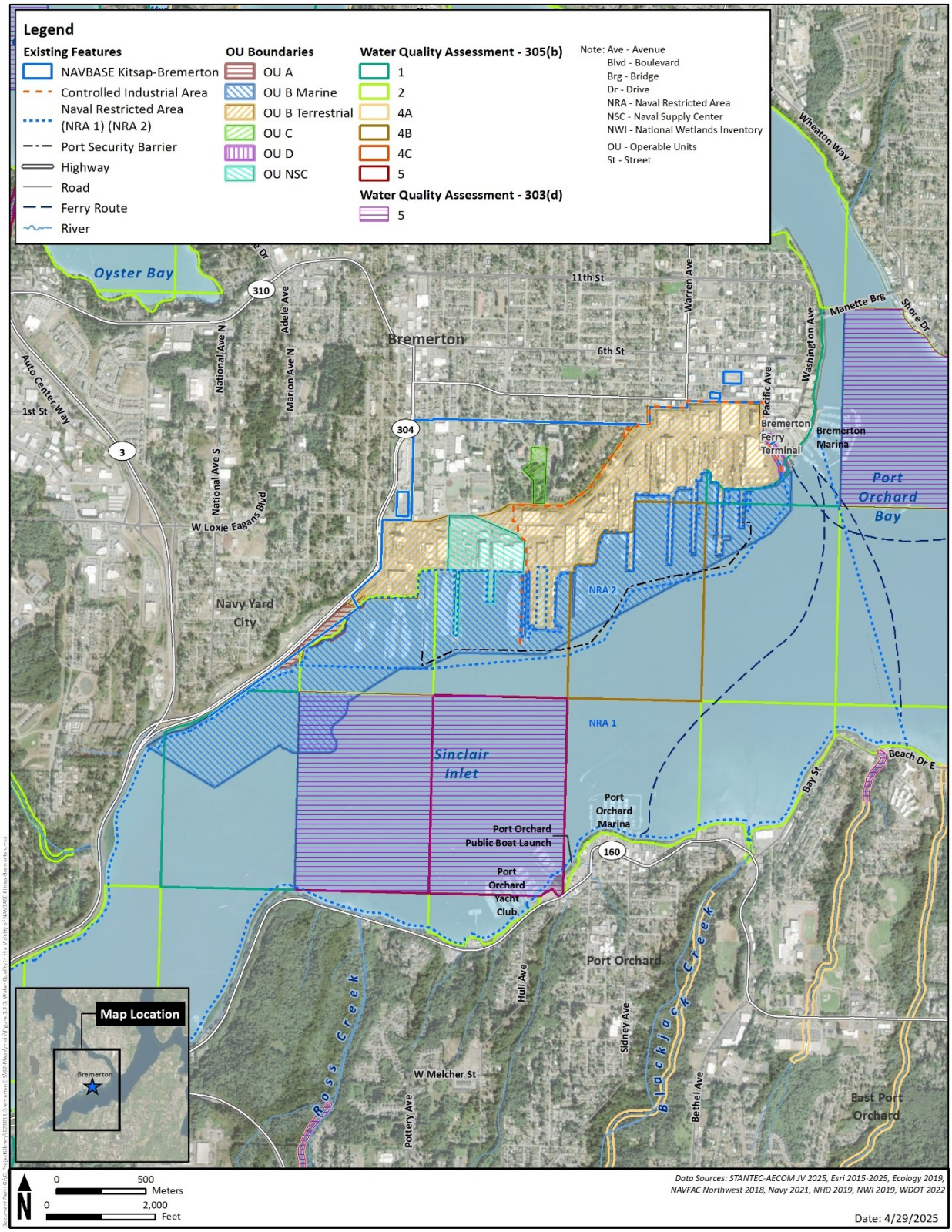

Figure 3.3-3 Water Quality in the Vicinity of NAVBASE Kitsap-Bremerton

Sinclair Inlet is approximately 4.3 miles long and 1.2 miles wide and relatively shallow, with water depths in the center of the inlet generally between 35 and 65 feet (Noble et al. 2013). The salinity of seawater in Sinclair Inlet is approximately 29 parts per thousand (NAVFAC NW 2002), compared to about 34 parts per thousand for the nearby Pacific Ocean. Water circulation patterns in Sinclair Inlet are a consequence of its complex bathymetry and have impacted water quality (see Section 3.4 for discussion of bathymetry). The USGS estimates that Sinclair Inlet tidal exchange with a medium tide (i.e., mean low water to mean high water) is approximately 950 million cubic feet (Noble et al. 2013). Sinclair Inlet generally remains thermally stratified (Noble et al. 2013) and the residence time for water within a stratified basin can be an order of magnitude longer than for a well-mixed basin. Water retention times in Sinclair Inlet can exceed 1 month.

Freshwater input to Sinclair Inlet is from stream runoff, direct precipitation, and groundwater flow. Additional intermittent freshwater input comes from point and non-point sources through controlled stormwater infrastructure, publicly owned treatment works, and uncontrolled urban/terrestrial runoff. The Sinclair Inlet watershed includes forested land; highways; urban and suburban areas; and residential, commercial, and industrial development. Surface runoff from these areas contains a mix of contaminants including pathogens, toxic metals, and organics; nutrients; and sediment. Historical over-water shipyard activities; transport of contaminants present in upland fill materials to the marine environment via groundwater, stormwater, and erosion have resulted in human health risks associated with the presence of polychlorinated biphenyls (PCBs) and mercury in marine tissues (NAVFAC NW 2022). In addition, discharges of pressure relief groundwater, direct discharge of groundwater, and stormwater systems from NAVBASE Kitsap-Bremerton are a known source of mercury, which comes from contaminated soil (USGS 2018). Sinclair Inlet periodically experiences low dissolved oxygen associated with elevated nutrient concentrations and phytoplankton blooms (Navy 2019a). Low dissolved oxygen can result in fish die-offs (see Section 3.5 for additional discussion on impacts to biological resources in Sinclair Inlet).

WAC 173-201A-612 has established the following designated uses for Sinclair Inlet: aquatic life uses; recreational use; harvest use; and miscellaneous uses of aesthetics, boating, commerce/navigation, and wildlife habitat. However, Sinclair Inlet is closed to shellfish harvest due to pollutant levels and limitation of consumption of fish from Sinclair Inlet is recommended by the Washington State Department of Health (Washington State Department of Health 2015, 2016).

Multiple streams emptying into the southern and western reaches of Sinclair Inlet exceed water quality standards and are subject to or will require reductions in pollutant loads (Ecology 2022). Figure 3.3-3 depicts the water quality assessment 305(b) and 303(d) listed Washington State waters in the NAVBASE Kitsap-Bremerton project area; these are defined in Section 3.3.1. Waters between Mooring A and Pier 5 are Category 4B for PCBs in tissue and have a pollution control plan (i.e., OU B Marine Remedial Action) (Navy 2019a; Ecology 2022). Waters between Mooring E and Mooring A, and from Pier 6 eastward, are not classified in any category for water quality. Several areas within Sinclair Inlet but outside the project area(s) have a pollution control plan for fecal coliform, dissolved oxygen, and temperature (Ecology 2022). A TMDL is in place for fecal coliform in Sinclair Inlet and Dyes Inlet, for which PSNS & IMF conducts a voluntary fecal coliform monitoring program to detect and resolve discharges containing bacteria. The City of Bremerton has undertaken a multi-year project to reduce combined sewer overflows, which has drastically reduced the number of sewer discharges from the City's sanitary system. Direct discharges to Sinclair Inlet under the PSNS & IMF NPDES Industrial Discharge Permit do

not contain significant amounts of nutrients or other materials that would reduce dissolved oxygen in Sinclair Inlet. See Section 3.4 for discussion of marine sediment quality.

Floodplains

The waterfront area in the project footprint that includes the existing dry docks, piers, wharves, and quay walls is in Federal Emergency Management Administration (FEMA) Zone AE (see Figure 3.3-1), which indicates the area is subject to 100-year flooding events. The FEMA Zone AE in the project area has a base flood elevation of 13 to 14 feet mean sea level (FEMA 2017a, 2017b) or approximately 20 to 21 feet mean lower low water (MLLW). These values were adjusted by 6.79 feet to account for the difference between mean sea level and MLLW. Tsunami inundation areas are discussed in Section 3.4.

Wetlands and Other Waters of the United States

Sinclair Inlet is a navigable water of the U.S. with limits up to areas subject to inundation by the mean high tide waters. There are no wetland areas identified at NAVBASE Kitsap-Bremerton (see Figure 3.3-1). However, estuarine wetlands within the ROI are present, but not abundant along the south and southwest shorelines of Sinclair Inlet. These wetlands are identified and mapped by the U.S. Fish and Wildlife Service (USFWS) in the National Wetlands Inventory (NWI) (USFWS 2021). Figure 3.3-1 shows the NWI-mapped wetlands, combining for a total of approximately 334 acres around Sinclair Inlet (USFWS 2021). See Section 3.5 for description of marine habitats.

Shorelines

The Sinclair Inlet shoreline is a heavily developed area that ranges from 0 to 32 feet MLLW. The shoreline of NAVBASE Kitsap-Bremerton is steeply sloping; armored with riprap and concrete quay walls; includes several pile-supported piers, dry docks, and other in-water structures typical of an industrialized waterfront; and contains a limited amount of shallow subtidal and intertidal habitat (Fresh et al. 2006; Lowry et al. 2013). Much of the littoral zone (nearshore, shallow water) has been eliminated due to fill and armoring of the shoreline associated with the shipyard (Fresh et al. 2006). Fill that overlies beach and estuarine soils at varying depths have substantially altered the waterfront area at NAVBASE Kitsap-Bremerton. See Section 3.5 for more information on how shoreline alterations have affected marine habitats and species.

NAVBASE Kitsap-Bangor

Groundwater

Three distinct aquifer systems have been identified at NAVBASE Kitsap-Bangor: perched, shallow, and sea level aquifers (Navy 2018a). Groundwater moves from inland areas of higher elevation toward streams or nearshore areas of lower elevation with little influx from Hood Canal (Navy 2018a). NAVBASE Kitsap-Bangor uses groundwater from sea level aquifers as a potable water source. The drinking water program is managed by the Public Works Department with direct oversight by NAVBASE Kitsap-Bangor Environmental staff. To protect the aquifer, NAVBASE Kitsap-Bangor maintains a Wellhead Protection Plan which limits activities within certain distances of the wells and establishes several wellhead protection areas around each well (Navy 2018a). The project area on NAVBASE Kitsap-Bangor is not located within any critical aquifer recharge areas (Kitsap County 2021).

Surface Waters

NAVBASE Kitsap-Bangor drainage consists of five small streams entering Hood Canal and two tributaries of Clear Creek and Strawberry Creek exiting to the southeast, which empty into Dyes Inlet. The project

areas are located within the Clear Creek and Strawberry Creek watersheds (Kitsap County 2017). Navy staff delineated four wetlands located within the vicinity of the proposed PSNS laydown expansion area (base wetlands) (Figure 3.3-2). The wetlands are isolated and do not have a continuous surface connection to any tributaries or other jurisdictional waters of the United States. There are no freshwater bodies within the project area on NAVBASE Kitsap-Bangor that are on the most recent 303(d) list (Ecology 2022).

Stormwater discharges from urbanized, non-industrial areas are covered under a Phase II municipal separate storm sewer system (MS4) permit, EPA permit WAS026646 (EPA Region 10 2021). Under the permit, the Navy must develop and implement a stormwater management program for covered facilities and include the following control measures: public education and outreach, public participation and involvement, illicit discharge detection and elimination, new development and redevelopment requirements, construction site runoff control, post-construction runoff control, pollution prevention, and good housekeeping.

Industrial stormwater discharges on NAVBASE Kitsap-Bangor are covered under EPA's Multi-Sector General Permit (EPA 2021). This permit requires preparation of a Stormwater Pollution Prevention Plan (SWPPP) (NAVFAC NW 2021) that identifies sources and potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges associated with industrial activities at NAVBASE Kitsap-Bangor, defines practices and measures for minimizing and controlling pollutants in discharges, establishes a plan for implementing the practices and measures, establishes a mechanism for ensuring implementation, and establishes a plan for evaluating effectiveness of controlling and reducing pollution of stormwater discharges.

Marine Waters

Marine waters at NAVBASE Kitsap-Bangor are not considered because the project area is located inland and away from Hood Canal (see Figure 3.3-2).

Floodplains

There are no floodplains in the project area on NAVBASE Kitsap-Bangor (see Figure 3.3-2) (FEMA 2017c).

Wetlands and Other Waters of the United States

There are no wetlands in the project area on NAVBASE Kitsap-Bangor according to the USFWS NWI tracker (USFWS 2021). However, wetland surveys conducted in the project area on NAVBASE Kitsap-Bangor in November 2022, February 2023, and October 2023 identified wetlands within and adjacent to the project footprint (see Figure 3.3-2). Specifically, wetlands are abutting either side of the gravel roadway that provides access to the existing laydown area. The onsite wetlands are isolated and do not have a continuous surface connection to any tributaries or other jurisdictional waters of the United States.

Shorelines

Shorelines at NAVBASE Kitsap-Bangor are not considered because the project area is located inland and away from Hood Canal (see Figure 3.3-2).

3.3.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Table 3.3-3 and Table 3.3-4 summarize the potential effects on water resources from RFFAs with a close causal relationship to the project at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, respectively.

Table 3.3-3 Effects to Water Resources from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Pier 3 Electrical Substation Repair, PSNS & IMF	Reasonably proximate by distance (1.3 miles) but scheduled to be complete before the Proposed Action construction is initiated. No overlap.	No relationship to the Proposed Action. No impacts to water resources in the ROI.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF and NAVBASE Kitsap-Manchester	Occurs in waters adjacent to Proposed Action components.	Removal of treated piles and contaminated sediment at the project area would decrease toxicity. Could increase turbidity in the short-term. Appropriate BMPs would be implemented to manage turbidity in the project area.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	Runoff may drain to Clam Bay and Rich Passage.	Could increase stormwater runoff entering Clam Bay and Rich Passage; new construction would be designed to include appropriate BMPs to manage runoff, erosion, and waste.
Navy – SIOP, PSNS & IMF	Could occur in upland areas and waters adjacent to Proposed Action components. Runoff may drain to Sinclair Inlet.	Could increase potential pollutant and sediment load entering Sinclair Inlet; new construction would be designed to include appropriate BMPs to manage runoff, erosion, and waste. Water quality monitoring would be implemented throughout the project to ensure compliance with state water quality standards. Beneficial effects to water quality would occur with improving stormwater treatment throughout other areas of the shipyard. Beneficial effects on sediment quality and water quality in Sinclair Inlet by removing large volumes of contaminated sediment from Sinclair Inlet.
Navy – OU B Marine Source Removal Actions	Occurs in waters adjacent to Proposed Action components within Sinclair Inlet.	While remedial actions include removal of contaminated sediment in Sinclair Inlet, this could increase turbidity in the short term during dredging activities unless appropriate BMPs are implemented to manage turbidity in the project area. Beneficial effects on sediment quality and water quality in Sinclair Inlet by removing large volumes of contaminated sediment from Sinclair Inlet.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	A CERCLA investigation is ongoing in the Proposed Action area. An initial remedial investigation is scheduled to begin in 2025, with an additional remedial investigation scheduled for 2028. The necessity and magnitude of a remedial action would be based on PFAS delineation and risk evaluation.
Navy – OU A, OU B Terrestrial, and OU NSC CERCLA actions for PFAS.	Located within or adjacent to NAVBASE Kitsap-Bremerton Proposed Action area.	A CERCLA investigation is ongoing in the Proposed Action area. The Navy is conducting ongoing CERCLA investigations at OU A, OU B Terrestrial, and OU NSC. Initial remedial investigations are expected to begin in 2025-2026 with additional investigations between 2029 and 2033. The necessity and magnitude of a remedial action would be based on PFAS delineation and risk evaluation. Remedial investigation and remedial action work will be dependent on access during construction activities associated with the Proposed Action.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	Runoff could drain to Sinclair Inlet.	Could increase potential pollutant and sediment load entering Sinclair Inlet; new construction would be designed to appropriate BMPs to manage runoff, erosion, and waste.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Runoff may drain to Sinclair Inlet.	Could increase potential pollutant and sediment load entering Sinclair Inlet; new construction would be designed to include appropriate BMPs to manage runoff, erosion, and waste.
Port of Bremerton - Marina Breakwater Replacement, Port Orchard Marina	In-water construction in the Port Orchard Bay.	Turbidity could increase in the short-term in the Port Orchard Bay during replacement of the marina breakwater.
Private Development – The Beacon and Beacon II	Located approximately 0.9 mile northeast of the NAVBASE Kitsap-Bremerton Proposed Action Areas in East Bremerton.	No relationship to the Proposed Action. No impacts to water resources in the ROI.
Private Development – McWilliams Apartments	Located approximately 4 miles north of the NAVBASE Kitsap-Bremerton Proposed Action Areas in East Bremerton.	No relationship to the Proposed Action. No impacts to water resources in the ROI.

Legend: BMP = best management practice; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; DD = Dry Dock; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; OU = Operable Unit; PFAS = per- and polyfluoroalkyl substances; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; SIOP = Shipyard Infrastructure Optimization Program

Table 3.3-4 Effect to Water Resources from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Transit Protection Program Support Facilities	Located approximately 4 miles north of the NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to water resources in the ROI.
Navy – Child Development Center	Located approximately 2,200 feet southeast and 3,700 feet south of the NAVBASE Kitsap-Bangor Proposed Action Areas.	Could increase potential pollutant and sediment load entering surface waters; new construction would be designed to appropriate BMPs to manage runoff, erosion, and waste.
Navy – Military Working Dog Kennel Replacement	Located approximately 1,300 feet north and southeast of the NAVBASE Kitsap-Bangor Proposed Action Areas.	Could increase potential pollutant and sediment load entering surface waters; new construction would be designed to appropriate BMPs to manage runoff, erosion, and waste.
Navy – Repair Substation 5	Located approximately 3 miles north of the NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to water resources in the ROI.
Navy – Tang Road Repair	Located approximately 4.5 miles north of NAVBASE Kitsap-Bangor Proposed Action areas.	No relationship to the Proposed Action. No impacts to water resources in the ROI.
Navy – Equipment Processing Building	Located approximately 4 miles north of NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to water resources in the ROI.
Navy – Relocate Flier Road	Located approximately 5 miles north of NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to water resources in the ROI.
Navy – CERCLA actions for PFAS	Located within the NAVBASE Kitsap-Bangor Radio Hill Proposed Action Area.	A CERCLA investigation at the Radio Hill site determined all PFAS concentrations were below screening levels. Further investigation is not recommended for the Radio Hill site.
Navy – CERCLA OU 1 Site A	Located approximately 4 miles north of the NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to water resources in the ROI.
Navy – CERCLA OU 2 Site F	Located within the NAVBASE Kitsap-Bangor Forge Shop Proposed Action Area (access road only).	Beneficial effects to groundwater quality from extraction and treatment of explosives constituent-contaminated groundwater. Due to overlap of only a small portion of the Forge Shop access road, there would be limited relationship to the Proposed Action.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Alternate Power Transmission Line	The transmission line would extend from a commercial electrical power source at Clear Creek Road to a Bangor substation. Exact location TBD.	TBD

Legend: BMP = best management practice; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; OU = Operable Unit; PFAS = per- and polyfluoroalkyl substances; ROI = Region of Influence; TBD = to be determined; UXO = unexploded ordnance

3.3.3 Environmental Consequences

This section discusses the potential short- and long-term effects to water resources that could result from implementation of the no-action alternative and the action alternatives. The effects analysis evaluated the potential for beneficial or adverse impacts in consideration of BMPs summarized in Table 3.3-5 for NAVBASE Kitsap-Bremerton and Table 3.3-6 for NAVBASE Kitsap-Bangor.

3.3.3.1 Nature and Type of Effects

Effects to surface and marine water resources could occur due to discharge of untreated and/or improperly managed groundwater, stormwater, or process water to Sinclair Inlet during construction or operations. Effects to marine waters, wetlands, and shorelines from increased turbidity and mobilization of contaminated sediment could also occur due to dredging, transport and disposal of dredged material, in-water demolition/construction, and pile driving. Overall, this could result in temporary and localized impacts to water quality, including an increase in turbidity or change in dissolved oxygen content, pH, or water temperature. Effects to marine water quality, wetlands, and shorelines from effluent discharge and sediment resuspension could result in increases in toxic metal concentrations in marine waters. Vessel operations during construction and operations could have the potential to impact water quality by introducing contaminants (e.g., petroleum, oils, and lubricants [POLs]) and waste into the water and through sediment resuspension from propeller scour. Effects to floodplains could occur if development alters the overall function of the floodplain.

Table 3.3-5 Water Resources Best Management Practices for NAVBASE Kitsap-Bremerton

BMP	*Impacts Reduced/Avoided*	*Description*	*Applicability*
WATER MGMT BREM-1	Impacts to water quality	Stormwater Pollution Prevention Plan Prior to any ground disturbing activities at NAVBASE Kitsap-Bremerton, the Navy will comply with all NPDES permitting requirements for discharges of construction-generated water associated with construction activities. Construction activities at NAVBASE Kitsap-Bremerton would be covered under a construction stormwater NPDES permit. This would include the preparation of a SWPPP and associated BMPs, a dewatering plan, and dewatering contingency plan.	Construction
WATER MGMT BREM-2	Impacts to water quality	Stormwater Management Approach During Construction Stormwater would be diverted to dedicated diversion channels and on to a treatment system designed to remove turbidity (suspended solids) and contaminants regulated by a construction stormwater NPDES permit (see WATER MGMT BREM-1). Treated stormwater would be discharged to Sinclair Inlet. During high flow conditions (i.e., up to 10-year, 24-hour frequency storm) or when stormwater flows exceed treatment rates, water would be stored in holding tanks or an engineered sump prior to treatment and discharge. Construction activities around the site will, to the extent practicable, sequence impervious surface demolition to minimize the area of exposed soil. The following measures and features would be provided as part of the upland stormwater treatment system: • Provide temporary erosion and sediment control measures (common to all components), including perimeter silt fence, construction entrances with wheel wash, interceptor dikes and swales, catch basin inlet protection, plastic sheeting, and erosion blankets. • Provide a treatment system targeting total suspended solids and known contaminants. • Provide pumps and settling tanks.	Construction
WATER MGMT BREM-3	Impacts to groundwater and water quality	Groundwater Management Approach During Construction • *Excavation* – A series of large-diameter deep dewatering wells and shallow sumps would be installed around the inside of the shoring wall and sumps within the excavations. The sumps will capture groundwater and drain the excavation and the deep wells will capture and prevent groundwater at the bottom of the cutoff from moving into the excavation. • *Cofferdams* – Groundwater recovery wells would be installed within the area enclosed by the cofferdam system to limit seawater intrusion into the excavation. The cofferdam wells will draw primarily seawater. • *Water Treatment* – Treatment would be provided prior to discharge to Sinclair Inlet in compliance with a construction stormwater NPDES permit (see WATER MGMT BREM-1).	Construction

BMP	*Impacts Reduced/Avoided*	*Description*	*Applicability*
WATER MGMT BREM-4	Impacts to water quality	Erosion Avoidance Practice Soil exposed as part of the project in the upland construction footprint shall be protected from erosion (with plastic sheeting, filter fabric) after exposure, in compliance with the construction stormwater NPDES permit (see WATER MGMT BREM-1).	Construction
WATER MGMT BREM-5	Impacts to marine waters	Materials- Pollutants Material placed in the water shall first be thoroughly inspected to ensure they are free of hazardous materials.	Construction
WATER MGMT BREM-6	Impacts to marine waters	Equipment Cleaning - Pollutants Project-related equipment (dredges, barges, backhoes) used in the water would be decontaminated prior to use.	Construction
WATER MGMT BREM-7	Impacts to marine waters	Materials and Equipment Cleaning – Aquatic Invasive Species To prevent the spread of aquatic invasive species, decontamination of vessels and marine equipment (other than equipment that undergoes chemical decontamination) shall follow the Washington State Department of Fish and Wildlife decontamination guidance (https://wdfw.wa.gov/species-habitats/invasive/prevention). Note that per Washington State Department of Fish and Wildlife guidance, all non-Washington registered vessels are required to purchase an annual Aquatic Invasive Species "permit."	Construction
WATER MGMT BREM-8	Impacts to marine waters and shorelines	Stockpiling • No imported materials (fill, riprap, pipe) would be stockpiled or rehandled in the water or along the shoreline. • Stockpiled material would be placed upland, away from marine waters.	Construction
WATER MGMT BREM-9	Impacts to marine waters	Debris Containment and Removal • All trash shall be secured to ensure it does not enter adjacent surface waters. Any floating debris generated during construction shall be retrieved. Debris removed from the marine/aquatic environment shall be disposed of per local, state, and federal regulations at an approved upland disposal facility. • A debris containment boom shall be deployed around marine equipment. Any debris in the containment boom shall be removed immediately and disposed of at an approved upland disposal facility. • Following completion of in-water construction activities, a side scan or hydrographic survey will be conducted to locate any lost construction debris and it will be removed by mechanical means or divers at the end of each component and/or at the end of the work season, as appropriate.	Construction

BMP	*Impacts Reduced/Avoided*	*Description*	*Applicability*
WATER MGMT BREM-10	Impacts from dredging and discharges to waters of the U.S.	CWA Section 404 Permitting • The Navy will implement project-specific BMPs as required by USACE-issued permit(s) under the CWA Section 404 and Rivers and Harbors Act Section 10 permit, and Ecology's CWA Section 401 Water Quality Certification. • The Navy will implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under CWA Section 404.	Construction
WATER MGMT BREM-11	Impacts to marine water quality	Turbidity Reduction Practice – Cofferdams Exterior sheet pile wall or cofferdam would be placed around the M2D2 excavation area, providing a barrier between the excavation area and Sinclair Inlet thus eliminating or substantially reducing turbidity in Sinclair Inlet.	Construction
WATER MGMT BREM-12	Impacts to marine water quality	Turbidity Reduction Practice – Closed Environmental Clamshell Dredge Bucket Mechanical dredging with a closed environmental clamshell dredge bucket would be used to remove dredged material, where practicable. The environmental clamshell dredge bucket is designed to minimize turbidity during dredging and as the bucket is raised through the water column and to minimize spillage during transfer of dredged material to barges.	Construction
WATER MGMT BREM-13	Impacts to marine water quality	Turbidity Reduction Practice – Dredging Production Rate The dredging production rate shall be reduced, as appropriate, to reduce turbidity.	Construction
WATER MGMT BREM-14	Impacts to marine water quality	Turbidity Reduction Practice – Debris Sweeps Debris sweeps prior to dredging would be conducted and can minimize loss of dredged material from dredge bucket and turbidity during dredging.	Construction
WATER MGMT BREM-15	Impacts to marine water quality	Turbidity Reduction Practice – Barge Overflow Barges will be loaded to less than full capacity to prevent overflow of dredged material or water discharge from dredged material barges. Decant water will be removed from barges prior to movement off site to prevent overflow during transport. Barges will not be transported off site during inclement weather. Frequency of decant water removal will match precipitation.	Construction
WATER MGMT BREM-16	Impacts to marine water quality	Turbidity Reduction Practice – Dredging Dredging shall be suspended during adverse weather conditions to prevent the accidental release of dredged material.	Construction
WATER MGMT BREM-17	Impacts to marine water quality	Turbidity Reduction Practice – Grounding of Marine Equipment No grounding of marine equipment shall be permitted.	Construction

BMP	Impacts Reduced/Avoided	Description	Applicability
WATER MGMT BREM-18	Impacts to marine water quality	Marine Construction Equipment All equipment shall be inspected daily by the contractor for cleanliness and leaks. If a leak is detected, the contractor will immediately notify the Navy and construction Contracting Officer's Representative, the equipment will be removed from the water, and the equipment will be repaired in place by the end of the shift or removed from the construction area and will not be used until the leak is repaired and equipment cleaned. For any equipment repaired in place, measures would be implemented to contain leaks and minimize impacts to marine waters.	Construction
WATER MGMT BREM-19	Impacts to water quality	Pile Placement/Removal Perform work in accordance with the best management practices outlined in the EPA Region 10 Best Management Practices for Piling Removal and Placement in Washington State (EPA, 2016) and Washington State Department of Natural Resources Derelict Creosote Piling Removal BMPs for Pile Removal and Disposal (Washington State Department of Natural Resources, 2017).	Construction
WATER MGMT BREM-20	Impacts to water quality	General – Petroleum, Oils, Lubricants • All equipment shall be inspected daily by the contractor. If a leak is detected, the contractor will immediately notify the Navy and construction Contracting Officer's Representative, the equipment will be removed from the water, and the equipment will be repaired in place by the end of the shift or removed from the construction area. An oil boom shall be deployed; equipment will not be reused until it has been repaired, cleaned, and is fully operational. • Wash water resulting from washdown of equipment or work areas shall be contained and collected for treatment prior to disposal in compliance with the construction stormwater NPDES permit (see WATER MGMT BREM-1). • Equipment that enters surface waters shall be maintained to prevent any visible sheen from petroleum products. If a visible sheen occurs, the contractor will immediately notify the Navy. • No oil, fuels, or chemicals shall be discharged to surface waters or onto land where there is a potential for re-entry into surface waters to occur. • No cleaning solvents or chemicals used for tools or equipment cleaning shall be discharged to ground or surface waters. • When possible, hydraulic fluids shall be vegetable-based. • Contractor shall be responsible for development of a Spill Plan for approval by the Government to include immediate steps following identification of a spill, spill response materials that would be maintained onboard in-water equipment, the chain of command to be contacted in the event of a spill, and third-party spill response provider that would be responsible for cleanup.	Construction

BMP	*Impacts Reduced/Avoided*	*Description*	*Applicability*
WATER MGMT BREM-21	Impacts to water quality	General – Refueling (upland) Refueling of equipment shall only be permitted at approved fueling facilities and at least 50 feet from the water.	Construction
WATER MGMT BREM-22	Impacts to water quality	General – Refueling (in-water) Fueling of vessels shall be done at approved fueling facilities. For equipment that cannot be fueled out of the water (e.g., barge crane), spill prevention booms shall be employed.	Construction
WATER MGMT BREM-23	Impacts to water quality	General – Concrete Only tremie, precast (marine grade), or cast-in-place (marine grade) concrete shall be used. No lime, chemicals, or other toxic or harmful materials related to non-marine grade concrete shall be permitted to be discharged to surface waters.	Construction
WATER MGMT BREM-24	Impacts to marine water quality and shorelines	Turbidity Reduction Practice – Propeller Scour • Tug propeller revolutions will be minimized to the extent practicable. • Where appropriate, propeller wash will be positioned into deep water (i.e., reposition tug). • Vessel movements will be minimized to the extent practicable. • Vessel thrust will be minimized to the extent practicable while understanding exemptions may be needed for safety considerations. • Vessel propeller wash will be minimized to the extent practicable, with preference to mooring to spudded/anchored vessels or structures when applicable.	Operations
WATER MGMT BREM-25	Impacts to water quality	Work Area Cleanliness • Personnel working in the drydock must clean their work areas at the end of each shift. Each project must have a cleaning crew assigned to maintain the overall cleanliness of the drydock. Keep work areas outside of the drydocks clean to minimize loss into Sinclair Inlet or the storm drain system. • Environmental personnel conduct monthly cleanliness inspections of outdoor areas. Remove debris to minimize loss into Sinclair Inlet or the storm drain system. • Do not clean paved areas, equipment, buildings, or other structures using wet methods (hosing down) without approval from Navy environmental personnel.	Operations
WATER MGMT BREM-26	Impacts to water quality	OHS Storage and Handling • Store liquid OHS in containers with tight fitting lids and inside secondary containments. Material stockpiles must be covered or stored inside. Covers or other methods to prevent material exposure to stormwater must be in place at all times when work with the stockpiles is not occurring.	Operations

BMP	Impacts Reduced/Avoided	Description	Applicability
		• Drip pans, secondary containment, or other protective devices must be used at hose connections when transferring oil, fuel, solvent, oily wastewater, and paint. Leaking connections, valves, pipes, and hoses carrying wastewater, fuel, oil, or other hazardous fluids must be immediately repaired, replaced, or isolated. • Conduct regular inspections of storage areas so leaks and spills are detected as soon as possible. Clean all spills and leaks immediately.	
WATER MGMT BREM-27	Impacts to water quality	<u>Containment and Control of Dust and Overspray</u> • Abrasive blasting operations are conducted inside sealed, leak-tight containments. Blasting operations are secured immediately if any containment dust or grit leaks are identified, and all leaks must be repaired before blasting resumes. • Pressure washing and hydroblasting wastewater must be captured inside a leak-tight containment and collected for treatment. Blasting operations are secured immediately if any containment water leaks are identified, and all leaks must be repaired before blasting resumes. • All spray painting application of copper antifouling paint is conducted inside sealed, leak-tight containments. Spray paint operations using other than antifouling paint must be performed within an enclosure to prevent overspray and spillage. Roller or brush applications of antifouling paint must include use of tarps or containments positioned underneath the work area. Painting operations are secured immediately if any containment paint leaks are identified, and all leaks must be repaired before painting resumes. • Other activities that generate pollutants (e.g., metal particles, sawdust, paint chips, slag from hot-work processes) must be contained.	Operations
WATER MGMT BREM-28	Impacts to water quality	<u>Vehicle and Equipment Preventive Maintenance</u> • Leaks from vehicles and equipment must be contained using a drip pan or absorbent. Leaking equipment must have the leak secure and cleaned up by the end of the shift. • Vehicles and equipment may be washed only in designated, approved cleaning areas with wastewaters recycled or routed to the City of Bremerton sanitary sewer. • Government vehicles and equipment must be checked for leaks before use. Vehicles and equipment must be maintained in good condition at all times. Routinely inspect infrequently used vehicles and equipment for leaks.	Operations
WATER MGMT BREM-29	Impacts to water quality	<u>Material Loading and Unloading</u> • Discharges to the drydock floor or the drydock drainage system must have prior approval from Navy environmental staff. Use tarps, secondary containments, or other protective	Operations

BMP	Impacts Reduced/Avoided	Description	Applicability
		devices during operations that could spill significant materials (e.g., liquid hazardous materials, wastes, wastewater, and fuels) on the drydock floor. • Mix paints in a secondary containment designed to prevent spills to the drydock floor. • Equipment and supplies must be on hand for control and cleanup of liquid or debris spills. Design the spill kit for the material being used. Examples of spill kit items are drop cloths, absorbents, rubber mats, tape, tarps, brooms, or vacuums. • When loading and unloading liquids and fine-granulated materials at outdoor loading areas, prevent potential spills to storm drains by using a valved storm drain line, covering drains with a rubber mat, or placing a temporary berm around vulnerable storm drains. Loading and unloading areas must have a stocked spill kit designed for the material being loaded or unloaded at transfer site.	
WATER MGMT BREM-30	Impacts to water quality	<u>Solid Waste</u> Solid waste containers must be covered. Waste containers with drains must have the drains plugged. Solid waste containers must be closed at all times except when waste is being added.	Operations
WATER MGMT BREM-31	Impacts to water quality	<u>Treated Lumber Products</u> Treated wood must only be used when required by Navy fire prevention requirements. Collect all treated lumber debris including sawdust and drill shavings or dust. Whenever possible, make cuts and perform machining operations in the shop or under cover.	Operations
WATER MGMT BREM-32	Impacts to water quality	<u>Discharges Into Storm Drains</u> Do not discharge anything to a storm drain unless authorized by Navy environmental staff, any discharges not authorized by the PSNS & IMF NPDES permit will not be approved.	Operations
WATER MGMT BREM-33	Impacts to water quality	<u>Outdoor Work Areas</u> • Mix paints indoors or in a cofferdam designed to prevent spills to Sinclair Inlet or storm drains. • Equipment and supplies must be on hand for control and cleanup of liquid or debris spills. Examples of items needed in a spill kit include drop cloths, absorbents, rubber mats, tape, tarps, brooms, or vacuums. Design the spill kit for the material being used. • Metal work areas on piers must be constructed to prevent rainwater from contacting the work process or debris or both. Navy environmental staff can grant an exemption if the size of the work piece reasonably precludes conducting the work undercover. • Metal work areas on piers intended for use for more than 1 month must be completely enclosed. The enclosure must be constructed such that debris cannot be washed out of the enclosure. Exhaust vents from work areas must be filtered to capture particulates.	Operations

BMP	Impacts Reduced/Avoided	Description	Applicability
WATER MGMT BREM-34	Impacts to water quality	Storm Sewer Systems Cleaning Inspect catch basins and stormwater treatment systems at least yearly. Clean oils, debris, sludge from catch basins, settling and detention basins, oil and water separators, conveyance systems, and stormwater treatment systems regularly, to prevent stormwater contamination. Clean and maintain stormwater treatment systems per the manufacturers' specifications. Clean catch basins when there is fewer than 6 inches clearance from the debris surface to the invert of the lowest pipe. Label stormwater drains with a warning similar to: "Dump no waste. Drains to the bay."	Operations
WATER MGMT BREM-35	Impacts to water quality	Fueling Operations • All equipment and vehicles must be moved to the inshore end of the pier or mooring for fueling evolutions. • Except in transit to or from a ship or dry dock, portable fuel tanks are not allowed on piers or barges. • All over-water OHS transfers must follow the PSNS & IMF requirements, which includes applicable Coast Guard requirements. Over-water OHS transfers should be performed during daylight and normal working hours. After-hours transfers must meet staffing and lighting requirements and receive concurrence from Navy environmental staff.	Operations

Note: Consistent with the Action Agenda for Puget Sound, the Navy would comply with all permit requirements; implement construction and operations BMPs; and follow avoidance, minimization, and mitigation measures during construction to minimize impacts to marine waters. Specifically, construction would be consistent with the following strategies identified in the 2022-2026 Action Agenda for Puget Sound (Puget Sound Partnership 2023b): Strategy 8 - Toxic Chemical Pollution, Strategy 9 - Water Pollution Source Identification & Correction, Strategy 10 - Stormwater Runoff & Legacy Contamination, and Strategy 14 - Invasive Species.

Legend: BMP = best management practice; CWA = Clean Water Act; EPA = U.S. Environmental Protection Agency; M2D2 = Multi-Mission NAVBASE = Naval Base; NPDES = National Pollutant Discharge Elimination System; OHS = oil and hazardous substances; PIC = Person in Charge; psi = pounds per square inch; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; SWPPP = Stormwater Pollution Prevention Plan; U.S. = United States; USACE = U.S. Army Corps of Engineers

Table 3.3-6 Water Resources Best Management Practices for NAVBASE Kitsap-Bangor

BMP	Impacts Reduced/Avoided	Description	Applicability
WATER MGMT BANGOR-1	Impacts to water quality	Stormwater Pollution Prevention Plan Prior to any ground disturbing activities at NAVBASE Kitsap-Bangor, the Navy will establish compliance with the current EPA Construction Stormwater General Permit. The Construction Stormwater General Permit includes requirements for management and treatment of stormwater and the preparation of a SWPPP and associated BMPs.	Construction

BMP	*Impacts Reduced/Avoided*	*Description*	*Applicability*
WATER MGMT BANGOR-2	Impacts to water quality	Erosion Avoidance Practice Soil exposed as part of the project shall be protected from erosion (with plastic sheeting, filter fabric) after exposure, in compliance with the construction stormwater NPDES permit (see WATER MGMT BANGOR-1).	Construction
WATER MGMT BANGOR-3	Impacts to water quality	General – Petroleum, Oils, Lubricants • All equipment shall be inspected daily by the contractor. If a leak is detected, the contractor will immediately notify the Navy and construction Contracting Officer's Representative, and the equipment shall be removed from the construction area and shall not be used until the leak is repaired and equipment cleaned and shall only be returned once it is repaired and fully operational. • Wash water resulting from washdown of equipment or work areas shall be contained for proper disposal and shall not be discharged unless authorized. • No oil, fuels, or chemicals shall be discharged to surface waters or onto land where there is a potential for re-entry into surface waters to occur. • No cleaning solvents or chemicals used for tools or equipment cleaning shall be discharged to ground or surface waters. • When possible, hydraulic fluids shall be vegetable-based. • Contractor shall be responsible for development of a Spill Plan for approval by the Government to include immediate steps following identification of a spill, spill response materials that would be maintained onboard in-water equipment, the chain of command to be contacted in the event of a spill, and third-party spill response provider that would be responsible for cleanup.	Construction and Operations
WATER MGMT BANGOR-4	Impacts to water quality	General – Refueling Refueling of equipment shall only be permitted at approved fueling facilities and at least 50 feet from any surface water.	Construction and Operations

Legend: BMP = best management practice; EPA = U.S. Environmental Protection Agency; NAVBASE = Naval Base; NPDES = National Pollutant Discharge Elimination System; SWPPP = Stormwater Pollution Prevention Plan

3.3.3.2 Impact Assessment Methodology

The analysis of water resources examines the potential impacts on groundwater, surface water, marine waters, floodplains, wetlands, and shorelines. Groundwater analysis focuses on the potential for impacts to the quality, quantity, and accessibility of the water. The analysis of surface water quality considers the potential for impacts that may change the water quality, including both improvements and degradation of current water quality. Marine waters analysis includes potential changes to physical and chemical characteristics. The analysis of floodplains considers if any new construction is proposed within a floodplain. The impact assessment of wetlands considers the potential for impacts that may change the local hydrology, soils, or vegetation that support a wetland. The analysis of shorelines considers if there is potential to affect shoreline ecological functions, flooding or storm surge areas, areas of erosion and sedimentation, water quality and temperature, and presence of nutrients and pathogens.

3.3.3.3 Impact Analysis for Alternative 1: No-Action

Under the no-action alternative, neither of the two action alternatives would occur at NAVBASE Kitsap-Bremerton or NAVBASE Kitsap-Bangor. Therefore, no project-related impacts to water resources would occur. RFFAs involving construction activities (see Table 3.3-3) would implement appropriate BMPs to manage runoff, erosion, and waste to minimize impacts to water quality. With implementation of the RFFAs *Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF* and *OU B Marine Remedial Actions* (see Table 3.3-3), overall improvement to marine water quality and surface sediment quality would occur due to the positive long-term impact of removing creosote-treated piling and structures and contaminated sediment from Sinclair Inlet.

3.3.3.4 Impacts Analysis for Alternative 2 (Preferred Alternative)

NAVBASE Kitsap-Bremerton

Construction-related Impacts

Groundwater

This groundwater analysis predicts that upland construction activities at NAVBASE Kitsap-Bremerton would interact with groundwater at variable depths. Deeper excavation would intercept the shallow groundwater table and hydrostatic pressure would allow groundwater to seep into the excavated areas and cofferdams. Upland construction activities associated with trenching for utilities would have limited interaction with groundwater and therefore limited impacts. Groundwater used for drinking water would not be affected by the proposed construction at NAVBASE Kitsap-Bremerton as groundwater use at NAVBASE Kitsap-Bremerton is limited to groundwater monitoring only. Replacement of impervious surfaces disturbed during construction, as required by the OU B Terrestrial ROD (Navy et al. 2004), would minimize stormwater infiltration and subsequent mobilization of contaminants in groundwater.

Upland construction activities at NAVBASE Kitsap-Bremerton would occur within OU B Terrestrial with known soil and groundwater contamination (see Section 3.15). As a result, groundwater may transport contaminants into excavated areas. Construction activities would comply with the NAVBASE Kitsap-Bremerton Excavation Management Plan (NAVFAC NW 2020) and applicable Land Use Controls. Construction personnel would stockpile and dewater excavated material on-site within the excavation extents, allowing decanted water to drain to excavation dewatering sumps. Construction personnel would manage groundwater through dewatering, collection, testing, and treatment in excavation areas and cofferdams, as described in Table 3.3-5, BMPs WATER MGMT BREM-1 and -3. Specifically, a treatment system designed to remove turbidity (suspended solids) and contaminants regulated by a

construction stormwater NPDES permit would treat groundwater collected during construction prior to discharge into Sinclair Inlet to meet permitted discharge limits.

Construction within the OU B Terrestrial has the potential to affect or limit access to existing groundwater monitoring wells. Affected monitoring wells would be decommissioned in accordance with Ecology regulations (Chapter WAC 173-160-381) and replaced in the same location (as close to as practically possible) with the same well construction. Replacement monitoring well requirement would be identified in the construction drawings and specifications.

With implementation of construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 and -3) and compliance with applicable CWA permits and other regulatory requirements, short-term adverse effects to groundwater from construction of Alternative 2 are not expected.

Surface Water

Upland construction activities at NAVBASE Kitsap-Bremerton would have the potential to impact surface water resources. Because the proposed construction activity would exceed 1 acre in size, implementation of Alternative 2 would require coverage under a construction stormwater NPDES permit. The NPDES permit would contain requirements for management and treatment of stormwater and include the preparation of a SWPPP and associated BMPs, as described in Table 3.3-5, WATER MGMT BREM-1. Construction personnel would implement these construction BMPs and other general construction measures to minimize impacts from discharges to surface and marine waters (see Table 3.3-5, WATER MGMT BREM-1 through -23). Construction activities would also comply with the NAVBASE Kitsap-Bremerton Excavation Management Plan (NAVFAC NW 2020) and all applicable Land Use Controls.

Implementation of Alternative 2 at NAVBASE Kitsap-Bremerton would include demolition of the existing stormwater system along with impervious surfaces within the construction footprint. The OU B Terrestrial ROD (Navy et al. 2004) requires maintaining/restoring impervious surfaces to minimize mobilization of contaminants that could leach into surface waters. Because this is not possible during periods of the proposed construction, stormwater from the construction site may contain pollutants. Stormwater collection and treatment during construction would minimize water accumulation in the construction site and prevent direct runoff into Sinclair Inlet. Construction BMPs include measures to collect, test, treat, and discharge stormwater and groundwater flows during construction until installation of permanent stormwater and groundwater management systems (see Table 3.3-5, WATER MGMT BREM-1 through -3). These measures would include a treatment system designed to remove turbidity (suspended solids) and contaminants regulated by the construction stormwater NPDES permit prior to discharge to Sinclair Inlet.

With implementation of construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 through -23) and compliance with applicable CWA permits, short-term adverse effects to surface water from construction of Alternative 2 are not expected.

Marine Waters

As discussed under surface water, Alternative 2 would include BMPs to manage and treat stormwater and groundwater prior to discharge to Sinclair Inlet (see Table 3.3-5, WATER MGMT BREM-1 through -3). The treatment system would remove turbidity (suspended solids) and contaminants regulated by a construction stormwater NPDES permit. Discharges to Sinclair Inlet would include only treated stormwater/groundwater that meets permitted discharge limits. Discharges associated with project

construction would not be expected to contain fecal coliform or significant amounts of nutrients or other materials that would reduce dissolved oxygen in Sinclair Inlet. In addition, improvements in stormwater and City of Bremerton sanitary sewer infrastructure, as a result of new construction would likely lead to a decrease in discharges containing fecal coliform (e.g., domestic wastewater leaks). As a result, additional degradation is not expected for waters in Sinclair Inlet covered by TMDLs for fecal coliform and dissolved oxygen.

In-water construction activities (e.g., dredging, pile removal/installation, marine demolition, and construction) would disturb sediment, causing sediment resuspension and an associated increase in turbidity during periods of in-water construction. Water quality impacts would be localized and temporary. Throughout the project, water quality monitoring would be implemented to ensure compliance with state water quality standards. General in-water construction BMPs, where applicable, would minimize impacts from pollutants, aquatic invasive species, construction debris, stockpiling, POLs, and fuel (see Table 3.3-5, WATER MGMT BREM-5 through -9 and -18 through -23). BMPs for dredging would minimize impacts from turbidity and spread of contaminated sediment (see Table 3.3-5, WATER MGMT BREM-10 through -17). Specifically, the (1) use of cofferdams would isolate excavation areas from marine waters; (2) the use of closed environmental clamshell dredge buckets where possible would minimize turbidity during dredging and minimize spillage during transfer of dredged material to barges; and (3) reducing dredging production rates, conducting debris sweeps prior to dredging, preventing overflow of dredged material and decant water from barges, and suspending dredging during adverse weather would minimize impacts from turbidity. Additional water quality BMPs for mechanical dredging methods (clamshell, backhoe, excavator) and mechanical pretreatment methods (chisel, hoe-ram, and/or drag ripper) would be incorporated in the project's Water Quality Monitoring and Protection Plan. Dredging methods and/or BMPs shall be modified to maintain compliance with environmental requirements.

The Navy performed a hydrodynamic and sediment transport modeling analysis to evaluate the potential impacts of the proposed waterfront infrastructure improvements (see Appendix H). None of the modeled activities resulted in the exceedance of the state of Washington's turbidity water quality criteria for aquatic life at the 150-foot compliance boundary. Maximum predicted total suspended solids (TSS) levels for some pile related activities are higher than for dredging; however, the peaks are brief and TSS disperses rapidly from the pile-related activities. TSS from modeled activities is rapidly dispersed and well mixed both laterally and vertically by the time it reaches Port Orchard Marina, Charleston Beach, and the area of marine vegetation along the southern shoreline of Sinclair Inlet near the mouth of Blackjack Creek (maximum TSS below 1.0 milligrams per liter [mg/L]). During the busiest in-water construction years when multiple concurrent activities would occur, turbidity impacts would be localized within the OU B Marine boundary for Alternative 2. In addition, the modeling analysis did not consider the impact that BMPs and controls, such as pre-dredge debris sweeps or early warning monitors, would have on reducing the generation and dispersion of turbidity during in-water construction activities. Thus, the modeling results are considered conservative and impacts under actual operational conditions are expected to be less than predicted.

As part of the permitting process for in-water projects, potential dredged material will be characterized by chemical testing to determine disposal options. Sediment sampling results in dredge areas would be compared to Dredged Material Management Program (DMMP) screening levels. Sediment that exceeds the DMMP screening levels is not suitable for open water disposal and would be disposed of at upland

permitted landfills. Sediment that is below the DMMP screening levels would be suitable for open water disposal. This suitable dredged material would be passively dewatered onsite and decant water removed for treatment and discharge prior to transport for disposal to prevent spillage from the barges. This would minimize impacts to marine waters along the barge transport routes to the Elliott Bay Open Water Disposal Site, Contractor Multi-Use Site(s), or offsite staging area. Decant water would be treated prior to discharge to Sinclair Inlet, as described above. The Elliott Bay Open Water Disposal Site would only be used for disposal of suitable dredged material. Water quality monitoring is not required during disposal of suitable dredged material at the Elliott Bay Open Water Disposal Site.

Consistent with the Action Agenda for Puget Sound, the Navy would comply with all permit requirements; implement construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 through -23); and follow avoidance, minimization, and mitigation measures during construction to minimize impacts to marine waters.

With implementation of construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 through -23) and compliance with applicable CWA permits, short-term adverse effects to marine waters from construction under Alternative 2 are not expected. In addition, dredging and offsite disposal of dredged material that exceeds the DMMP screening levels would improve localized water quality and surface sediment quality conditions in the project area.

Floodplains

Adverse effects to floodplains could result from inundation, mobilization of contaminants, and damage to infrastructure/construction equipment. The entire project footprint at NAVBASE Kitsap-Bremerton is subject to potential flooding, with the nearshore and shoreline having the greatest susceptibility to flooding rain, storm surge, and wave action. Project design, including BMPs to manage stormwater runoff during construction (see Table 3.3-5, WATER MGMT BREM-1 and -2), would minimize the potential for flooding.

Several of the proposed new facilities at NAVBASE Kitsap-Bremerton would occur within the FEMA Zone AE 100-year floodplain (see Figure 3.3-1). Consistent with EO 11988 guidelines, public review will occur as part of the NEPA process (see Section 1.6). Because of the nature of the project (i.e., waterfront infrastructure improvements), there are no practicable alternatives outside the floodplain. The type of facilities and project footprint within the floodplain would be similar to existing conditions and would not affect overall function of the floodplain. The Navy design would raise the coping/pier deck heights of proposed new facilities to account for future sea level rise and be above current 100-year floodplain base elevations along the waterfront.

With implementation of construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 and -2), adverse impacts to floodplains are not expected and Alternative 2 would be in compliance with EO 11988.

Wetlands and other Waters of the United States

The waterfront infrastructure improvements at NAVBASE Kitsap-Bremerton include numerous in-water activities (e.g., dredge/fill, in-water demolition [pile removal] and construction [pile installation, new piers, M2D2]) that would result in temporary and permanent impacts to navigable waters of the U.S. within Sinclair Inlet (Table 3.3-7). The Navy would implement project-specific conditions as required by USACE-issued permit(s) under the CWA Section 404 and Rivers and Harbors Act Section 10 permit, and Ecology's CWA Section 401 Water Quality Certification (see Table 3.3-5, WATER MGMT BREM-10). The

Navy would also implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under CWA Section 404 (see Appendix F, *Compensatory Mitigation*). See Section 3.5 for a discussion of impacts to the benthic environment from the in-water construction.

Table 3.3-7 Impacts to Waters of the United States under Alternative 2 (Preferred Alternative)

Category	*Dredging Quantity (CY)*	*Unsuitable Dredged Material (CY)*	*Dredging Area (acres)*	*Fill Discharged Below MHHW (CY)*	*Fill Area (acres)*
Temporary	NA	NA	NA	136,900	2.02
Permanent	867,450	TBD*	36.92	550,600	11.25

Note: *Pending dredged material suitability determination.
Legend: CY = cubic yards; MHHW = mean higher high water; NA = Not Applicable; TBD = to be determined

Proposed construction would not directly impact any estuarine wetlands in Sinclair Inlet. As discussed above, measures to manage and treat stormwater, groundwater, construction water, and dredged material decant water prior to discharge to Sinclair Inlet would minimize impacts to water quality.

With implementation of construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 through -23 and); compliance with CWA Section 404 permits and CWA Section 401 Water Quality Certification; and implementation compensatory mitigation (see Appendix F, *Compensatory Mitigation*), short-term and long-term adverse effects to wetlands and other waters of the U.S. during construction activities are not expected.

Shorelines

In-water construction activities would mobilize contaminated sediment and increase turbidity, thereby affecting shorelines. However, the Navy hydrodynamic and sediment transport modeling analysis (see Appendix H) found that accumulated sedimentation would be on the order of 0.2 millimeters (mm) or less after 28 days of simulated construction activities, which is similar to the natural amount of sedimentation in Sinclair Inlet over the same 28-day period (Appendix H). The Navy would utilize in-water construction BMPs (see Table 3.3-5, WATER MGMT BREM-11 through -17), as applicable, to minimize impacts from turbidity and disturbance of contaminated sediment. Construction activities also would impact the shoreline directly by removal of existing quay walls and sheet pile walls; construction of the temporary shoreline structures; and replacement of quay walls and sheet pile walls. With implementation of BMPs (see Table 3.3-5, WATER MGMT BREM-11 through -17), localized, short-term adverse effects to shorelines during construction activities are not expected.

Operation-related Impacts

Groundwater

The Navy would continue to manage groundwater at NAVBASE Kitsap-Bremerton during operations of new facilities at PSNS & IMF in the same manner as under current conditions. This includes OU B Terrestrial remedial actions that limit potential infiltration of water into site soil and groundwater recharge through development and implementation of excavation management and land use control plans, groundwater use restrictions, paving of unpaved areas, and repair of damaged pavement (Navy et al. 2004). Under Alternative 2, groundwater relief sump pumps would run as needed to draw down the water table from around the new dry dock, preventing dry dock uplift. The design would include a cutoff

wall around the drydock to isolate upland groundwater from the new pressure release system. Most of the drainage volume within the cutoff wall would be from Sinclair Inlet, resulting in decreased mercury loading to Sinclair Inlet. The pressure relief groundwater would not be treated before discharge to Sinclair Inlet, which is consistent with drydock operations under the current PSNS & IMF NPDES Industrial Discharge Permit.

With management of groundwater in compliance with the current PSNS & IMF NPDES Industrial Discharge Permit WA0002062 (and the renewed permit, when received), long-term adverse effects to groundwater from operations from operation under Alternative 2 are not expected.

Surface Water

The addition of M2D2 would increase the amount of process water at PSNS & IMF by approximately 16 percent. Process water has the potential to impact water quality by releasing contaminants (e.g., toxic metals, POLs, liquid hazardous materials, wastes). However, the Navy would seek coverage for discharges of stormwater, groundwater, dry dock process water, single pass cooling water effluent originating from vessels in M2D2, and M2D2 dry dock dewatering from the new facilities through the existing CWA permitting process. In addition, the Navy would implement operations BMPs to minimize impacts from discharges to marine waters (see Table 3.3-5, WATER MGMT BREM-25 through -35). Discharges to Sinclair Inlet would be in compliance with the NPDES Industrial Discharge Permit and discharges to the City of Bremerton sanitary sewer would be in compliance with the SWDP.

Development of proposed facilities at NAVBASE Kitsap-Bremerton would result in a net gain of up to 354,500 square feet (8 acres) of impervious surface. The increase in impervious surface would result in a minor increase in stormwater runoff. However, new stormwater infrastructure at NAVBASE Kitsap-Bremerton would replace the existing stormwater system demolished as part of construction and provide additional capacity for increases in stormwater runoff associated with this increase in impervious surface area. The Navy would design the new stormwater infrastructure to accommodate treatment of more than 91 percent of the entire runoff volume over a multi-decade period of record (Ecology 2024); 100 percent of total storm event volumes is either diverted to the City of Bremerton sanitary sewer without treatment or treated prior to discharge to Sinclair Inlet or the City of Bremerton sanitary sewer. Design flow rate would be calculated using the Western Washington Hydrology Model (Ecology 2023), as described in the Stormwater Management Manual for Western Washington (Ecology 2024). The stormwater system would collect runoff from the surrounding upstream shipyard area, piers, and wharves. Water quality treatment structures would treat runoff pursuant to CWA permit requirements prior to discharge to Sinclair Inlet.

When vessels enter the dry dock and the caisson is closed, pumps would initially dewater the dry dock by pumping sea water directly back into Sinclair Inlet. After initial dewatering, the process water collection system (PWCS) would collect and manage any water that ends up on the floor of the dry dock, including stormwater and water from dry dock and vessel washdown processes. PWOWTS plants would treat all process water that has the potential to be contaminated as described in Section 2.3.2.5. The Navy currently discharges PWOWTS water treated by existing plants to the City of Bremerton sanitary sewer. The addition of final polishers to the combined process water and oily waste treatment plant will remove additional metals and hydrocarbon organics in treated wastewater to meet discharge requirements of the NPDES permit, allowing it to be discharged to Sinclair Inlet. The combined treatment

plant would discharge to the City of Bremerton sanitary sewer or Sinclair Inlet pursuant to CWA permit requirements.

With implementation of operations BMPs (see Table 3.3-5, WATER MGMT BREM-24 through -35) and the management, treatment, and discharge of stormwater, groundwater, non-contact cooling water, and process water in compliance with the PSNS & IMF NPDES Industrial Discharge Permit WA0002062 (and the renewed permit, when received) and SWDP Number ST0007374 at NAVBASE Kitsap-Bremerton, long-term adverse effects to surface water from operation under Alternative 2 are not expected.

Marine Waters

Post-construction maintenance dredging would not be required. Dry dock dewatering and propeller scour could result in sediment disturbance and cause a localized sediment plume, but this is expected to have little potential for resuspension of contaminated bottom sediment. This is primarily because sediment quality standards for contaminants of concern (COCs) would be met post-construction due to dredging that was completed during construction for M2D2 (refer to Section 3.4.3.4 for volume of unsuitable dredged material removed under Alternative 2). In addition, the Navy would implement measures (Table 3.3-5, WATER MGMT BREM-24) to reduce disturbance from propeller scour.

After initial pumping of sea water that is captured within the dry dock and direct discharge into Sinclair Inlet, any subsequent discharges of stormwater, groundwater, process water, or saltwater cooling effluent would comply with PSNS & IMF NPDES Industrial Discharge Permit requirements as discussed under surface water. The saltwater cooling effluent from DD1, DD2, DD4, and DD5 would continue to discharge from existing Shipyard Outfall 18. Saltwater cooling effluent from M2D2 would discharge to Sinclair Inlet via a new outfall extending from the shoreline east of M2D2. The outfall would end with a diffuser to allow controlled discharge of cooling water into Sinclair Inlet. The new outfall and diffuser would be located and configured to address potential localized impacts to ambient water quality. Effluent quality and quantity would comply with NPDES permit requirements for the new outfall.

Operation of proposed facilities has the potential to release contaminants (e.g., from use of POLs, refueling operations, and on-going maintenance and decommissioning) that could impact marine water quality. However, implementation of general and operations BMPs (see Table 3.3-5, WATER MGMT BREM-24 through -35) would minimize impacts to marine water quality from these general PSNS & IMF operations.

Consistent with the Action Agenda for Puget Sound, the Navy would construct and operate facilities that comply with all permit requirements and implement operational BMPs (see Table 3.3-5, WATER MGMT BREM-24 through -35) to minimize impacts to marine waters. With discharge of water to Sinclair Inlet in compliance the PSNS & IMF NPDES Industrial Discharge Permit and implementation of BMPs (see Table 3.3-5, WATER MGMT BREM-24 through -35), long-term adverse effects to marine waters from operation under Alternative 2 are not expected.

Floodplains

Management and treatment of stormwater under the PSNS & IMF NPDES Industrial Discharge Permit and increased capacity of the new storm drainage system would minimize the potential for adverse impacts from flooding as a result of stormwater runoff. As discussed in Section 2.3, project design would raise the coping/pier deck heights of proposed new facilities to account for future sea level rise and be above current 100-year floodplain base elevations along the waterfront. Through stormwater system

improvements and raised facilities, adverse effects to floodplains are not expected and Alternative 2 would be in compliance with EO 11988.

Wetlands and other Waters of the United States

There are no wetlands in the operation areas under Alternative 2 at NAVBASE Kitsap-Bremerton. Implementation of measures to minimize impacts to marine water quality (see Table 3.3-5, WATER MGMT BREM-24 through -35) would minimize adverse effects to estuarine wetlands along the south and southwest shorelines of Sinclair Inlet. Dredging and offsite disposal of dredged material that exceeds the DMMP screening levels would improve localized marine water quality affecting estuarine wetlands within Sinclair Inlet.

Shorelines

Although the outline of the shoreline would be modified, shorelines would continue to be steeply sloping and armored with riprap and stabilized with sheet pile walls and concrete quay walls. The hardened shoreline's interaction with waves would be similar to existing conditions. The new facilities along the waterfront would improve shoreline stability and reduce the long-term potential for migration of contaminated soil to the marine environment, consistent with the remedial action objectives identified in the OU B Terrestrial ROD (Navy et al. 2004). Little sediment currently accumulates on the shoreline due to its hardened condition (vertical quay walls and sheet pile walls); shoreline modifications would not change that condition. The Navy hydrodynamic and sediment transport modeling analysis (see Appendix H) found that impacts on wave action and longshore drift in Sinclair Inlet as a result of changes to the waterfront configuration would be negligible under Alternative 2.

With improvements to shoreline stabilization and hardening, long-term positive effects are expected with reduced erosion and migration of contaminated soil and from discharge of contaminated groundwater to surface marine waters being cut off. Adverse effects to shorelines during operations under Alternative 2 are not expected.

Effects Associated with Reasonably Foreseeable Future Actions

Construction

RFFAs involving construction activities would implement appropriate BMPs to manage runoff, pollutants, erosion, and waste to minimize impacts to water quality (see Table 3.3-5). With implementation of project BMPs and anticipated BMPs for RFFAs and compliance with applicable CWA permits, short-term adverse effects to water resources are not expected. Effects to water resources from construction under Alternative 2, when combined with effects to surface water from predicted environmental trends, would be greater than under Alternative 1 (No-Action Alternative).

Operation

During operation, the stormwater system would manage and treat periodic increases in stormwater runoff from the increased impervious surfaces in compliance with the PSNS & IMF NPDES Industrial Discharge Permit. However, the stormwater system is not designed to manage and treat high runoff volumes associated with the predicted increased frequency and/or intensity of extreme rain events.

The coping/pier deck heights of proposed new facilities would account for predicted future sea level rise, minimizing potential flooding impacts. Sea level rise would also have an impact on groundwater levels near the coastline, causing groundwater levels to rise in the project area during operation. This would increase the hydrostatic pressure of the water against the exterior of the proposed new dry dock, which

could increase the need for dewatering around the new dry dock. Alternative 2 also includes repairs to improve shoreline stability and to address future sea level rise.

With implementation of RFFAs *Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF*; *OU B Remedial Actions*; and *Shipyard Infrastructure Optimization Program, PSNS & IMF* (see Table 3.3-3), overall water quality in Sinclair Inlet would improve, due to the positive long-term effect of removing creosote treated pilings and structures and of OU B Marine remedial actions in Sinclair Inlet. Adverse effects to marine waters from operation under Alternative 2, when combined with both adverse and beneficial effects to marine waters from RFFAs, would be less than under Alternative 1 (No-Action Alternative).

NAVBASE Kitsap-Bangor

Construction-related Impacts

Groundwater
Construction of the Radio Hill complex expansion at NAVBASE Kitsap-Bangor is not expected to encounter groundwater. However, construction of a new larger forge shop and associated parking area at NAVBASE Kitsap-Bangor is expected to require excavation of 14 feet and may encounter groundwater. If encountered during construction, groundwater would be managed in compliance with the NPDES Construction Stormwater General Permit.

Any construction activities would be implemented in compliance with measures identified in the Wellhead Protection Plan (Navy 2023), including any activities within established wellhead protection areas. Construction activities at NAVBASE Kitsap-Bangor would include stormwater runoff protection measures, as identified in the NPDES Construction General Stormwater Permit (see Table 3.3-6, BMPs WATER MGMT BANGOR-1), which would also serve to protect groundwater quality.

With implementation of construction BMPs (see Table 3.3-6, BMPs WATER MGMT BANGOR-1) and compliance with applicable CWA permits and other regulatory requirements, short-term adverse effects to groundwater from construction under Alternative 2 are not expected.

Surface Water
Construction of the Radio Hill complex expansion and new larger forge shop and associated parking area at NAVBASE Kitsap-Bangor would be implemented in compliance with the NPDES Construction General Stormwater Permit (see Table 3.3-6, BMPs WATER MGMT BANGOR-1). This would include the preparation and implementation of a SWPPP and associated BMPs and other general construction measures (see Table 3.3-6, BMPs WATER MGMT BANGOR-1 through -4) to minimize impacts from discharges to surface and marine waters.

With implementation of construction BMPs (see Table 3.3-6, BMPs WATER MGMT BANGOR-1 through -4) and compliance with applicable CWA permits, short-term adverse effects to surface water from construction under Alternative 2 are not expected.

Floodplains
Construction activities at NAVBASE Kitsap-Bangor would not occur in floodplains (see Figure 3.3-2).

Wetlands and other Waters of the United States

Construction activities associated with the Radio Hill complex expansion at NAVBASE Kitsap-Bangor would occur within and adjacent to isolated, non-jurisdictional wetlands (Figure 3.3-4). The paving of the existing gravel access road is expected to result in less than 0.1 acre of unavoidable fill within the abutting non-jurisdictional wetlands. However, the laydown area expansion site was selected as it would result in the expansion of an existing facility, thereby reducing the overall area of new disturbance. Measures to manage and treat stormwater runoff and minimize release of pollutants (see Table 3.3-6, WATER MGMT BANGOR-1 through -4) from construction activities and use of the offsite staging and laydown area at NAVBASE Kitsap-Bangor would reduce indirect impacts to nearby wetlands.

With implementation of construction BMPs (see Table 3.3-6, WATER MGMT BANGOR-1 through -4), short-term and long-term adverse effects to wetlands and other waters of the U.S. during construction activities are not expected.

Operation-related Impacts

Groundwater

Compliance with the NAVBASE Kitsap-Bangor's coverage under EPA's Multi-Sector General Permit and MS4 Permit, and Energy Independence and Security Act (EISA) Section 438 would limit potential increase in stormwater pollutant loading and thus limit potential increase in pollution loading to the underlying groundwater aquifers (see Surface Water section for additional details on stormwater management and treatment). Impacts to groundwater recharge at NAVBASE Kitsap-Bangor would be minimized through implementation of Low Impact Development (LID) strategies that would accommodate a 10-year storm frequency and ensure predevelopment hydrology is maintained.

With management of groundwater in compliance with the EPA's Multi-Sector General Permit for NAVBASE Kitsap-Bangor, long-term adverse effects to groundwater from operations are not expected.

Surface Water

The Radio Hill complex expansion and new larger forge shop and associated parking area at NAVBASE Kitsap-Bangor would result in removal of forest and a net gain of 872,000 square feet (20 acres) of impervious surface. In accordance with UFC 3-210-10, LID and EISA Section 438, any increase in surface water runoff because of new impervious surfaces would be attenuated using permanent drainage management features. Under these requirements, federal facility projects with over 5,000 square feet of new impervious surface must maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property regarding the temperature, rate, volume, and duration of flow. LID strategies would be implemented as required to accommodate runoff due to increased impervious surfaces.

In addition, NAVBASE Kitsap-Bangor is in compliance with coverage under EPA's Multi-Sector General Permit. This permit includes preparation of a SWPPP that provides a management and engineering strategy to improve the quality of stormwater runoff from NAVBASE Kitsap-Bangor and thereby improve the quality of the receiving waters. Although there would be a small increase in runoff volumes and rates associated with additional impervious areas under Alternative 2, the stormwater management system would be designed in compliance with applicable stormwater regulations. Proposed new facility designs would follow the EPA's Multi-Sector General Permit conditions such that no significant adverse impacts to water quality would result.

Figure 3.3-4 Wetlands in the Alternatives 2 Footprint at NAVBASE Kitsap-Bangor

With implementation of operations BMPs (see Table 3.3-6, BMPs WATER MGMT BANGOR-3 and -4) and the management, treatment, and discharge of stormwater in compliance with the EPA's Multi-Sector General Permit at NAVBASE Kitsap-Bangor, long-term adverse effects to surface water are not expected.

Floodplains

Predevelopment hydrology would be maintained, to the maximum extent technically feasible, at NAVBASE Kitsap-Bangor through compliance with LID and EISA Section 438 and there would no substantial increase in stormwater runoff or flooding potential. Adverse effects to floodplains are not expected and Alternative 2 would be in compliance with EO 11988.

Wetlands and other Waters of the United States

The Radio Hill complex expansion at NAVBASE Kitsap-Bangor would result in removal of forest and a net gain of 872,000 square feet (20 acres) of impervious surface.

Through compliance with the NAVBASE Kitsap-Bangor's coverage under EPA's Multi-Sector General Permit, as well as UFC 3-210-10, LID and EISA Section 438, stormwater pollutant loading to the nearby wetlands would be minimized. With management and treatment of stormwater in compliance with these regulations and EPA's Multi-Sector General Permit, long-term adverse effects to wetlands from operations at NAVBASE Kitsap-Bangor are not expected.

Effects Associated with Reasonably Foreseeable Future Actions

Construction

RFFAs involving construction activities would implement appropriate BMPs to manage runoff, pollutants, erosion, and waste to minimize impacts to water quality (see Table 3.3-6). With implementation of project BMPs and anticipated BMPs for RFFAs and compliance with applicable CWA permits, short-term adverse effects to water resources are not expected. Effects to water resources from construction under Alternative 2, when combined with effects to water resources from RFFAs, would be greater than under Alternative 1 (No-Action Alternative).

Operation

During operation, the stormwater system would manage and treat periodic increases in stormwater runoff from the increased impervious surfaces in compliance with coverage under EPA's Multi-Sector General Permit. Effects to water resources from operation under Alternative 2, when combined with effects to water resources from RFFAs, would be greater than under Alternative 1 (No-Action Alternative).

3.3.3.5 Impact Analysis for Alternative 3

NAVBASE Kitsap-Bremerton

Construction-related Impacts

Groundwater

Under Alternative 3, proposed demolition, construction, and modification of upland facilities at NAVBASE Kitsap-Bremerton would be similar to those under Alternative 2 (Section 3.3.3.4) and result in similar impacts to groundwater. Overall, Alternative 3 would involve less upland excavation than Alternative 2, so there would be a reduced potential for impacts to groundwater.

With implementation of construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 and -3) and compliance with applicable CWA permits and other regulatory requirements, short-term adverse effects to groundwater from construction of Alternative 2 are not expected.

Surface Water

Under Alternative 3, impacts to surface water at NAVBASE Kitsap-Bremerton would be similar to those under Alternative 2 (Section 3.3.3.4). Additional facilities under Alternative 3 (i.e., construction of new parking garage at NAVBASE Kitsap-Bremerton) would result in some additional impacts to surface water. Upland construction under Alternative 3 would be greater than 1 acre and require coverage under a construction stormwater NPDES permit, as described in Section 3.3.3.4. The NPDES permit would contain requirements for management and treatment of stormwater and include the preparation of a SWPPP and associated BMPs, as described in Table 3.3-5, WATER MGMT BREM-1. Construction personnel would implement these construction BMPs and other general construction measures to minimize impacts from discharges to surface and marine waters (see Table 3.3-5, WATER MGMT BREM-1 through -23)

With implementation of construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 through -23) and compliance with applicable CWA permits, short-term adverse effects to surface water from construction of Alternative 3 are not expected.

Marine Waters

As discussed under surface water, Alternative 3 would include BMPs to manage and treat stormwater and groundwater prior to discharge to Sinclair Inlet (see Table 3.3-5, WATER MGMT BREM-1 through -3). Discharges to Sinclair Inlet would include only treated stormwater/groundwater that meets permitted discharge limits.

In-water construction activities (e.g., dredging, pile removal/installation, marine demolition, and construction) would disturb sediment, causing sediment resuspension and an associated increase in turbidity during periods of in-water construction. Water quality impacts would be localized and temporary. Throughout the project, water quality monitoring would be implemented to ensure compliance with state water quality standards. General in-water construction BMPs, where applicable, would minimize impacts from pollutants, aquatic invasive species, construction debris, stockpiling, POLs, and fuel (see Table 3.3-5, WATER MGMT BREM-5 through -9 and -18 through -23). BMPs for dredging would minimize impacts from turbidity and spread of contaminated sediment (see Table 3.3-5, WATER MGMT BREM-10 through -17).

The Navy performed a hydrodynamic and sediment transport modeling analysis to evaluate the potential impacts of the proposed waterfront infrastructure improvements (see Appendix H). None of the modeled activities resulted in the exceedance of the state of Washington's turbidity water quality criteria for aquatic life at the 150-foot compliance boundary. For Alternative 3, turbidity impacts extended into Sinclair Inlet during dredging for the turning basin, which is located outside of OU B Marine. However, dredging for this component is scheduled to be completed in one season. In years without dredging for the turning basin, turbidity impacts for Alternative 3 are predicted to be within the OU B Marine boundary.

Management and disposal dredged material under Alternative 3 would be the same as described under Alternative 2 (Section 3.3.3.4). However, overall dredging volumes would be greater under Alternative 3 (Table 2-9).

With implementation of construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 through -23) and compliance with applicable CWA permits, short-term adverse effects to marine waters from construction under Alternative 3 are not expected. In addition, dredging and offsite disposal of dredged material that exceeds the DMMP screening levels would improve localized water quality and surface sediment quality conditions in the project area.

Floodplains

Impacts related to floodplains from construction under Alternative 3 would be similar to those described under Alternative 2 (Section 3.3.3.4). The type of facilities and project footprint within the floodplain would be similar to existing conditions and would not affect overall function of the floodplain. The Navy design would raise the coping/pier deck heights of proposed new facilities to account for future sea level rise and be above current 100-year floodplain base elevations along the waterfront. With implementation of construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 and -2), adverse impacts to floodplains are not expected and Alternative 3 would be in compliance with EO 11988.

Wetlands and other Waters of the United States

The waterfront improvements involving dredge/fill and in-water demolition (pile removal) and construction (pile installation, new piers, M2D2) would result in temporary and permanent impacts to waters of the U.S. within Sinclair Inlet (Table 3.3-8). Construction personnel would not begin in-water work prior to completion of the CWA authorization process, as indicated in Table 3.3-5, WATER MGMT BREM-10. The Navy would also implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under CWA Section 404 (see Appendix F, *Compensatory Mitigation* [in development]).

Table 3.3-8 Impacts to Waters of the United States under Alternative 3

Category	*Dredging quantity (CY)*	*Unsuitable Dredged Material (CY)*	*Dredging area (acres)*	*Fill discharged below MHHW (CY)*	*Fill area (acres)*
Temporary	NA	NA	NA	0	0
Permanent	1,651,000	TBD*	69	1,179,800	19.59

Note: *Pending dredged material suitability determination.

Legend: CY = cubic yards; MHHW = mean higher high water; NA = not applicable; TBD = to be determined

Proposed construction would not directly impact any estuarine wetlands in Sinclair Inlet. As discussed above, measures to manage and treat stormwater, groundwater, construction water, and dredged material decant water prior to discharge to Sinclair Inlet would minimize impacts to water quality.

With implementation of construction BMPs (see Table 3.3-5, WATER MGMT BREM-1 through -23); compliance with CWA Section 404 permits and CWA Section 401 Water Quality Certification; and implementation of compensatory mitigation (see Appendix F, *Compensatory Mitigation* [in development]), short-term and long-term adverse effects to wetlands and other waters of the U.S. during construction activities are not expected.

Shorelines

Impacts related to shorelines from construction under Alternative 3 would be similar to those described under Alternative 2 (Section 3.3.3.4). With implementation of BMPs (see Table 3.3-5, WATER MGMT BREM-11 through -17), short-term adverse effects to shorelines during construction activities are not expected.

Operation-related Impacts

Groundwater

The Navy would continue to manage groundwater at NAVBASE Kitsap-Bremerton during operations of new facilities at PSNS & IMF in the same manner as under current conditions. Due to the different soil conditions at the Mooring A site, the new M2D2 would be a concrete hydrostatic dry dock, meaning that the weight of the dry dock walls and floor would resist external water pressure forces without a separate groundwater pressure relief system. As a result, there would be no additional groundwater pumping during operations under Alternative 3, so there would be an overall reduction in groundwater pumping compared to Alternative 2.

With management of groundwater in compliance with the current PSNS & IMF NPDES Industrial Discharge Permit WA0002062 (and the renewed permit, when received), long-term adverse effects to groundwater from operations under Alternative 3 are not expected.

Surface Water

The addition of M2D2 would increase the amount of process water at PSNS & IMF by approximately 33 percent under Alternative 3. Process water has the potential to impact water quality by releasing contaminants (e.g., toxic metals, POLs, liquid hazardous materials, wastes). Similar to Alternative 2 (Section 3.3.3.4), discharges from the new facilities under Alternative 3 to Sinclair Inlet would be in compliance with the NPDES Industrial Discharge Permit and discharges to the city of Bremerton sanitary sewer would be in compliance with the SWDP.

Development of proposed facilities would result in a net gain of 433,000 square feet (10 acres) of impervious surface. The increase in impervious surface would result in a minor increase in stormwater runoff and be slightly greater than under Alternative 2. However, Alternative 3 would include new storm drainage infrastructure and water quality treatment structures to treat runoff pursuant to CWA permit requirements prior to discharge to Sinclair Inlet. Process water would be collected, treated, and discharged to city of Bremerton sanitary sewer or Sinclair Inlet pursuant to CWA permit requirements, as described under Alternative 2 (Section 3.3.3.4).

With implementation of operations BMPs (see Table 3.3-5, WATER MGMT BREM-25 through -35) and the management, treatment, and discharge of stormwater, groundwater, and process water in compliance with the PSNS & IMF NPDES Industrial Discharge Permit WA0002062 (and the renewed permit, when received) and SWDP Number ST0007374 at NAVBASE Kitsap-Bremerton, long-term adverse effects to surface water from operation under Alternative 3 are not expected.

Marine Waters

Similar to Alternative 2 (Section 3.3.3.4), discharges of stormwater, groundwater, process water, or saltwater cooling effluent to Sinclair Inlet would be in compliance with the PSNS & IMF NPDES Industrial Discharge Permit. Saltwater cooling effluent from M2D2 would discharge to Sinclair Inlet via a new outfall. The outfall would end with a diffuser to allow controlled discharge of cooling water into Sinclair

Inlet. The new outfall and diffuser would be located and configured to address potential localized impacts to ambient water quality. Operation of proposed facilities has the potential to release contaminants (e.g., from use of POLs, refueling operations, and on-going maintenance and decommissioning) that could impact marine water quality. However, implementation of general and operations BMPs (see Table 3.3-5, WATER MGMT BREM- -24 through -35) would minimize impacts to marine water quality from these general PSNS & IMF operations.

With discharge of water to Sinclair Inlet in compliance with the PSNS & IMF NPDES Industrial Discharge Permit and implementation of BMPs (see Table 3.3-5, WATER MGMT BREM-24 through -35), long-term adverse effects to marine waters from operation under Alternative 3 are not expected.

Floodplains

Impacts to floodplains under Alternative 3 would be similar to those described under Alternative 2 (Section 3.3.3.4). Through stormwater system improvements and raised facilities, adverse effects to floodplains are not expected and Alternative 3 would be in compliance with EO 11988.

Wetlands and other Waters of the United States

There are no wetlands in the operation areas under Alternative 3 at NAVBASE Kitsap-Bremerton. Implementation of measures to minimize impacts to marine water quality (see Table 3.3-5, WATER MGMT BREM-24 through -35) would minimize adverse effects to estuarine wetlands along the south and southwest shorelines of Sinclair Inlet. Dredging and offsite disposal of dredged material that exceeds the DMMP screening levels would improve localized marine water quality affecting estuarine wetlands within Sinclair Inlet.

Shorelines

Impacts to shorelines under Alternative 3 would be similar to those described under Alternative 2 (Section 3.3.3.4). With improvements to shoreline stabilization and hardening, long-term positive effects are expected with reduced erosion and migration of contaminated soil and from discharge of contaminated groundwater to surface marine waters being cut off. Adverse effects to shorelines during operations under Alternative 3 are not expected.

Effects Associated with Reasonably Foreseeable Future Actions

Effects to water resources from construction and operation under Alternative 3, when combined with effects to water resources from RFFAs, are the same as described for Alternative 2.

NAVBASE Kitsap-Bangor

Construction-related Impacts

Construction-related water resources impacts associated with the Radio Hill complex expansion at NAVBASE Kitsap-Bangor under Alternative 3 would be the same as those discussed under Alternative 2 (Section 3.3.3.4). However, there would be overall reduced impacts to water resources under Alternative 3 at NAVBASE Kitsap-Bangor without construction of the forge shop. With implementation of construction BMPs (see Table 3.3-6, WATER MGMT BANGOR-1 through -4), short-term adverse effects to water resources from construction of Alternative 3 are not expected.

Operation-related Impacts

Operation-related water resources impacts associated with the Radio Hill complex expansion at NAVBASE Kitsap-Bangor are discussed under Section 3.3.3.4. Development of proposed facilities would result in a net gain of 652,000 square feet (14.97 acres) of impervious surface. The increase in impervious surface would result in a minor increase in stormwater runoff but be slightly less than under Alternative 2. Through compliance with the NAVBASE Kitsap-Bangor's coverage under EPA's Multi-Sector General Permit, as well as UFC 3-210-10, LID and EISA Section 438, stormwater pollutant loading to the nearby wetlands would be minimized. With management and treatment of stormwater in compliance with these regulations and EPA's Multi-Sector General Permit, long-term adverse effects groundwater and nearby surface waters and wetlands from operations at NAVBASE Kitsap-Bangor are not expected.

With stormwater management in compliance with the EPA's Multi-Sector General Permit, long-term adverse effects to water resources during operation of Alternative 3 are not expected.

Effects Associated with Reasonably Foreseeable Future Actions

Effects to water resources from construction and operation under Alternative 3, when combined with effects to water resources from RFFAs, are the same as described for Alternative 2.

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3.4 Geological Resources

This discussion of geological resources includes topography, geology, soil, bathymetry, and marine sediment of the ROI.

3.4.1 Regulatory Setting

Table 3.4-1 provides a description of the existing regulatory environment for geological resources at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.4-1 Regulatory Setting for Geological Resources

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
Coastal Zone Management Act	16 U.S.C. section 1451, 15 CFR Part 930
UFC Seismic Design for Buildings NAVFAC Seismic Design for Buildings	UFC 3-310-04 NAVFAC P-355
Resource Conservation and Recovery Act	42 U.S.C. section 6901 et seq.
CERCLA	42 U.S.C. section 9601 et seq.; 40 CFR 302.4

Table 3.4-1 Regulatory Setting for Geological Resources

Law, Regulation, or Guidance	*Regulatory Citation*
DMMP	U.S. Army Corps of Engineers
State	
Water Quality Standards for Surface Waters of the State of Washington	Chapter WAC 173-201A and 40 CFR 131.45
Washington State Sediment Management Standards,	Chapter 173-204 WAC, 40 CFR 131.45

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; DMMP = Dredged Material Management Program; NAVFAC = Naval Facilities Engineering Systems Command; UFC = Unified Facilities Criteria; U.S. = United States; U.S.C. = U.S. Code; WAC = Washington Administrative Code.

3.4.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under geological resources at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor. The ROI for geological resources includes NAVBASE Kitsap-Bremerton, NAVBASE Kitsap-Bangor, and nearby areas, as depicted in Figure 3.4-1.

3.4.2.1 Existing Conditions

NAVBASE Kitsap-Bremerton

Topography

The topography at NAVBASE Kitsap-Bremerton ranges from flatland along the waterfront to steep hillsides that form the plateaued, rolling uplands. The industrial waterfront area ranges in elevation from sea level to 25 feet above mean sea level. The hillsides adjacent to the waterfront reach a maximum of 170 feet above mean sea level. The areas surrounding the drydocks and piers and along portions of the Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) shoreline have been identified as being moderately susceptible to landslide hazards (Kitsap County 2017a).

Geology

NAVBASE Kitsap-Bremerton is located on the Kitsap Peninsula, which is the remnant of a glacial-drift plain. The Vashon Glacier of the Pleistocene period deposited sedimentary layers of Vashon drift till and outwash deposits across the region, and as a result, glacial clay, silt, sand, and gravel underlie the upland areas of the installation (Figure 3.4-1) (Navy 2018).

NAVBASE Kitsap-Bremerton lies within the Seattle Fault Zone, with a branch of the active fault passing through PSNS & IMF (Figure 3.4-1). The Seattle Fault Zone is capable of producing an earthquake as large as magnitude 7.5, but less than magnitude 7.0 is more probable (Seattle Office of Emergency Management 2019; Dolcimascolo et al. 2022). The Cascadia Subduction Zone off the west coast of Washington also could generate an earthquake as large as magnitude 8 to 9.

While crustal earthquakes of magnitude 6.0 or greater have been instrumentally recorded in western Washington, paleoseismic evidence indicates that an approximately magnitude 7.0 to 7.2 earthquake occurred on the Seattle Fault Zone between 900 and 930 AD (Dolcimascolo et al. 2022). The latest national seismic hazard mapping efforts performed by the U.S. Geological Survey indicate that the estimated recurrence time for large earthquakes on the Seattle Fault Zone (i.e., magnitude 6.5 to 7.5) ranges from about 1,000 to 5,000 years (Frankel et al. 2007).

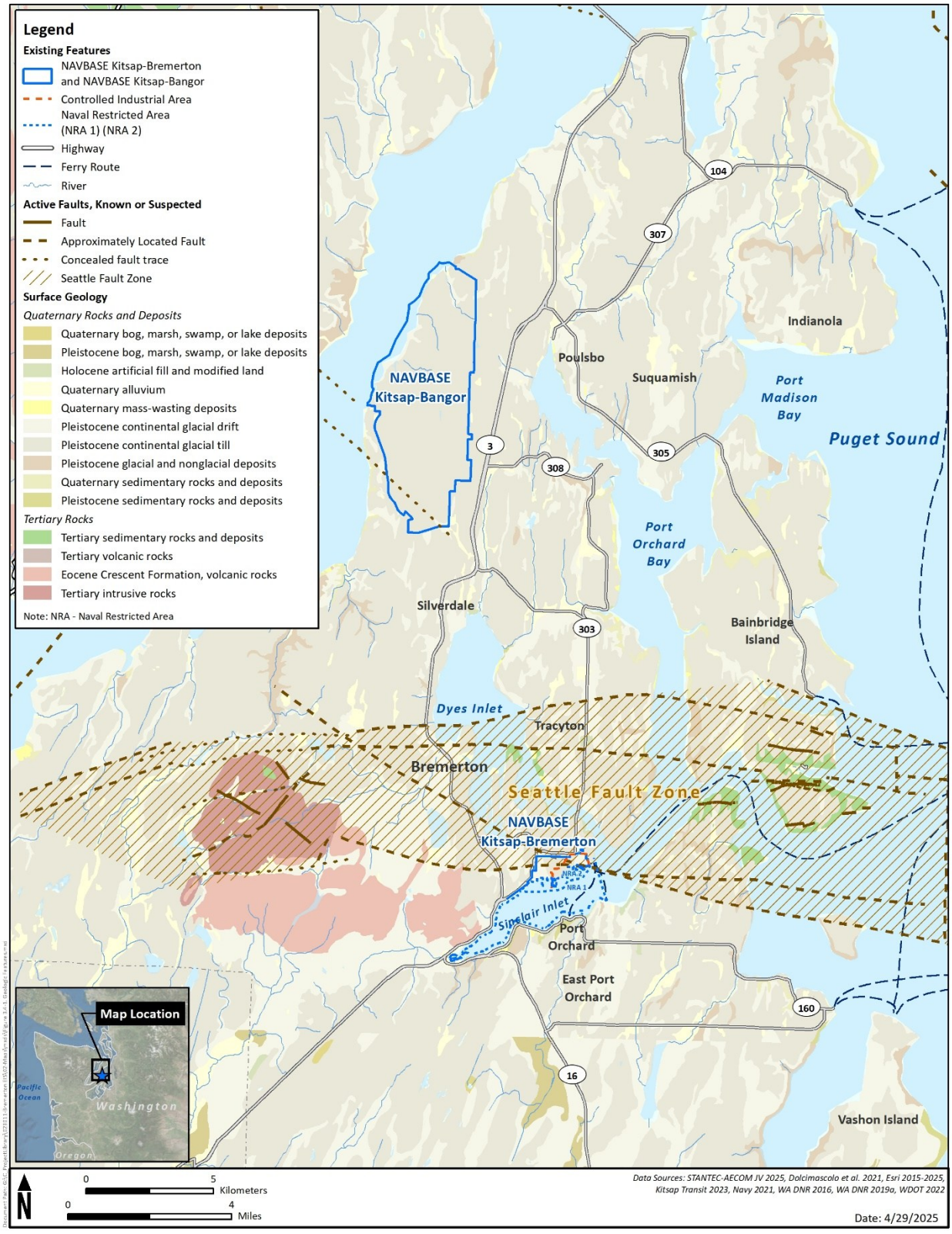

Figure 3.4-1 Geologic Features

The Navy has determined that much of the fill material in PSNS & IMF is susceptible to liquefaction. The area at PSNS & IMF would be subject to tsunami inundation from an approximately 9-foot wave amplitude for a simulated large earthquake (i.e., magnitude 7.0 to 7.5) along the Seattle Fault Zone (Dolcimascolo et al. 2022), and from an approximately 4-foot wave amplitude for a simulated magnitude 9.0 earthquake along the Cascadia Subduction Zone (Dolcimascolo et al. 2021) (Figure 3.4-2). The first wave of the modeled tsunami from the Seattle Fault Zone could arrive at Sinclair Inlet within 3 minutes after the simulated earthquake (Dolcimascolo et al. 2022).

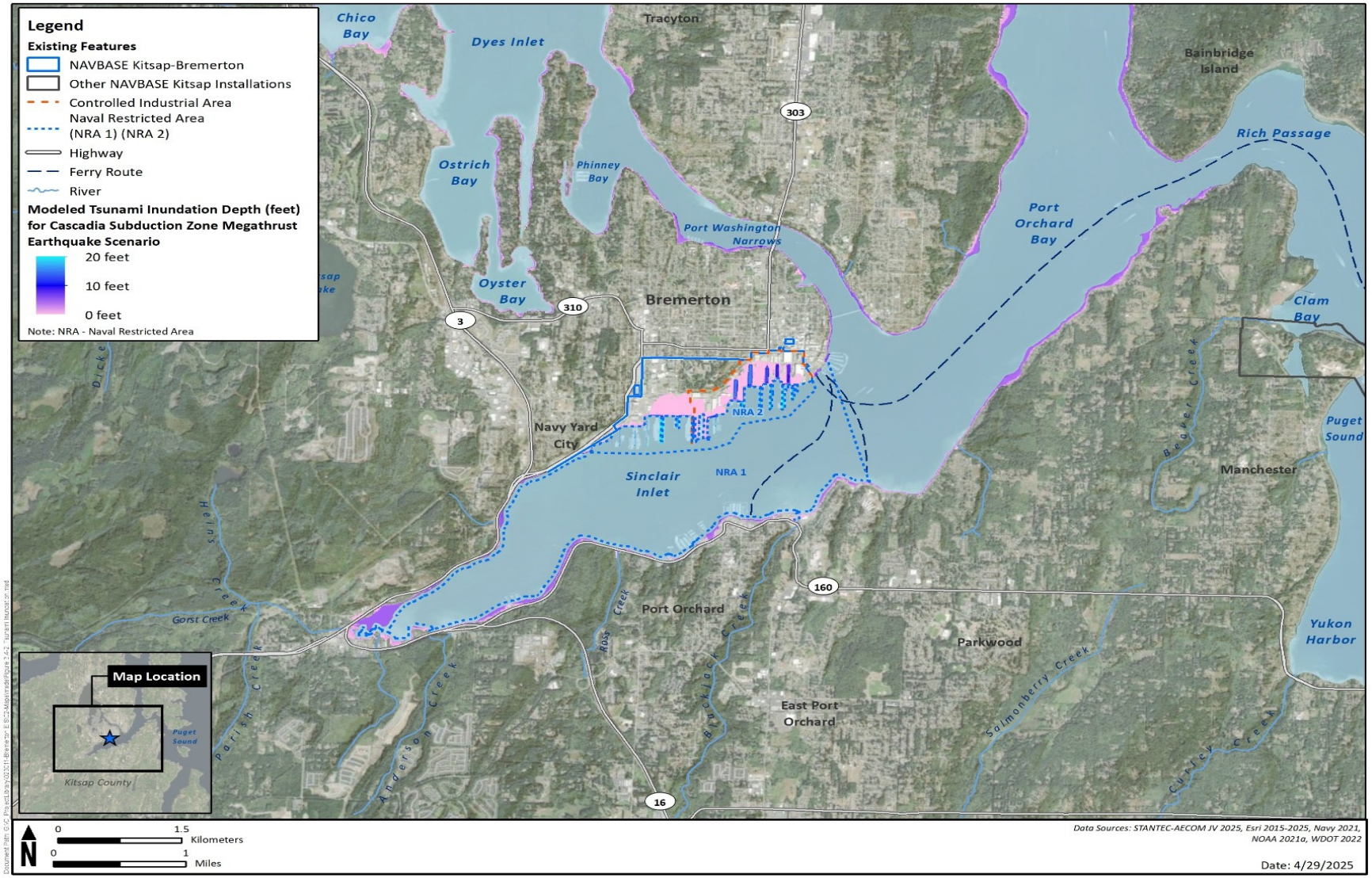

Figure 3.4-2 Tsunami Inundation Area at NAVBASE Kitsap-Bremerton

Soil

Soils of the Urban Alderwood series underlie the upland areas of NAVBASE Kitsap-Bremerton (Figure 3.4-3). This soil series consists of a stiff hardpan with low permeability and few engineering constraints. Artificial fill deposits and bay mud and peat underlie the waterfront area of the installation. The fill consists primarily of silty, gravelly sand with some silt and clay derived from grading of the adjacent hillside area. The soil density varies from loose to very dense, depending on the method of original fill placement and compaction. The upper 1 foot of the fill consists primarily of stiff gravelly soil. Soft deposits of peaty silt partially underlie the fill deposits (Navy 2018). There are no prime farmlands in the NAVBASE Kitsap-Bremerton project area (Natural Resources Conservation Service 2021).

Contaminated soil and groundwater are present throughout OU B Terrestrial and thus throughout the project area at NAVBASE Kitsap-Bremerton (Figure 3.4-4) (Navy et al. 2004a; see Section 3.15 for details on Installation Restoration sites and OUs). Remedial action objectives identified in the OU B Terrestrial ROD (Navy et al. 2004a) were developed to address all identified risks at the site, including risks to marine sediment quality posed by the potential movement of contaminated stormwater, groundwater, and site soil into Sinclair Inlet. These include: (1) installing pavement or clean soil cover with vegetation in unpaved areas and repairing existing damaged pavement to limit potential infiltration of water into site soil; and (2) repairing portions of existing shoreline protection that have potential for erosion.

Bathymetry

The seafloor in Sinclair Inlet off NAVBASE Kitsap-Bremerton is relatively flat with elevations ranging from approximately -30 to -60 feet mean lower low water (MLLW), then transitioning to steep shorelines along PSNS & IMF, as depicted in Figure 3.4-5.

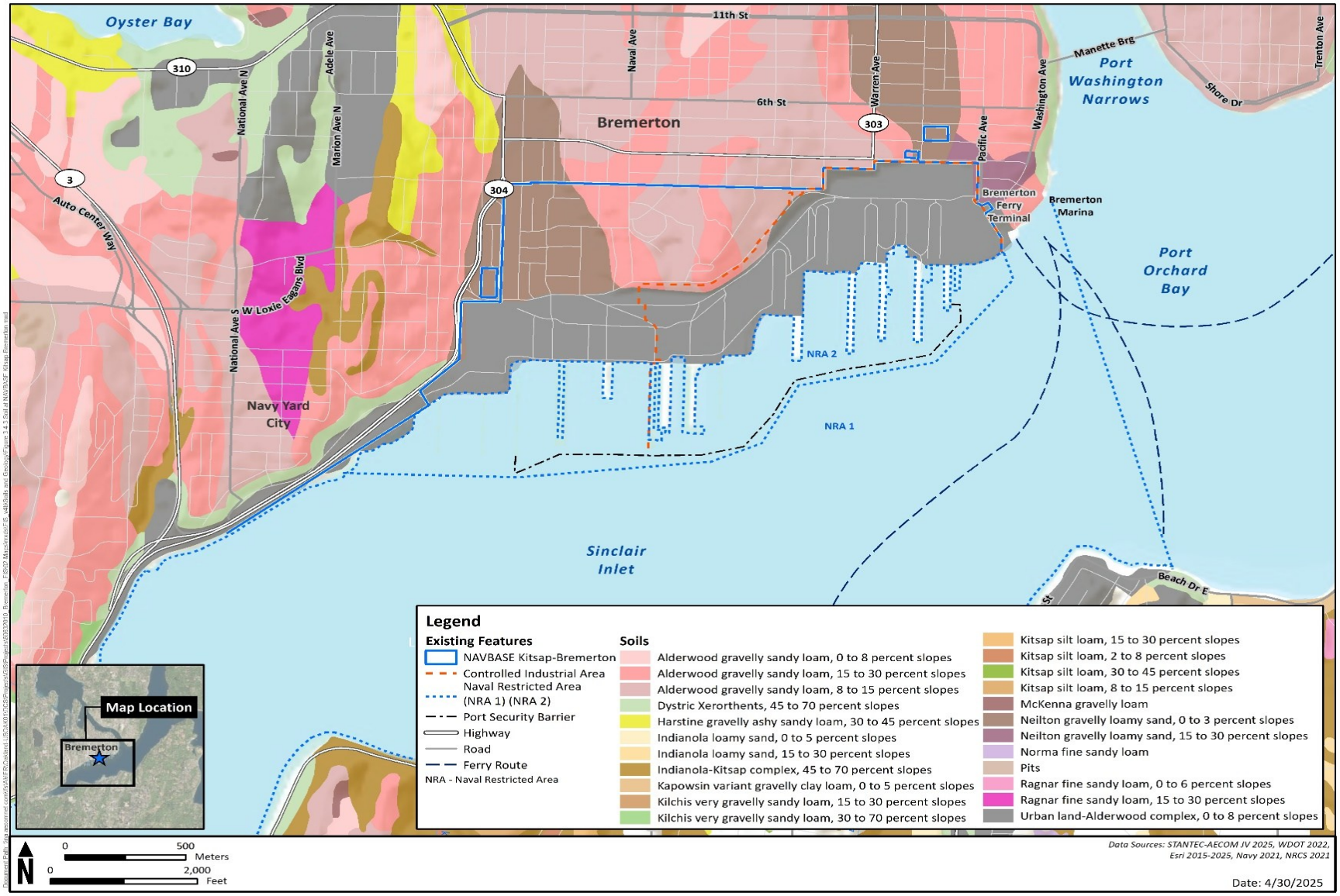

Figure 3.4-3 Soil at NAVBASE Kitsap-Bremerton

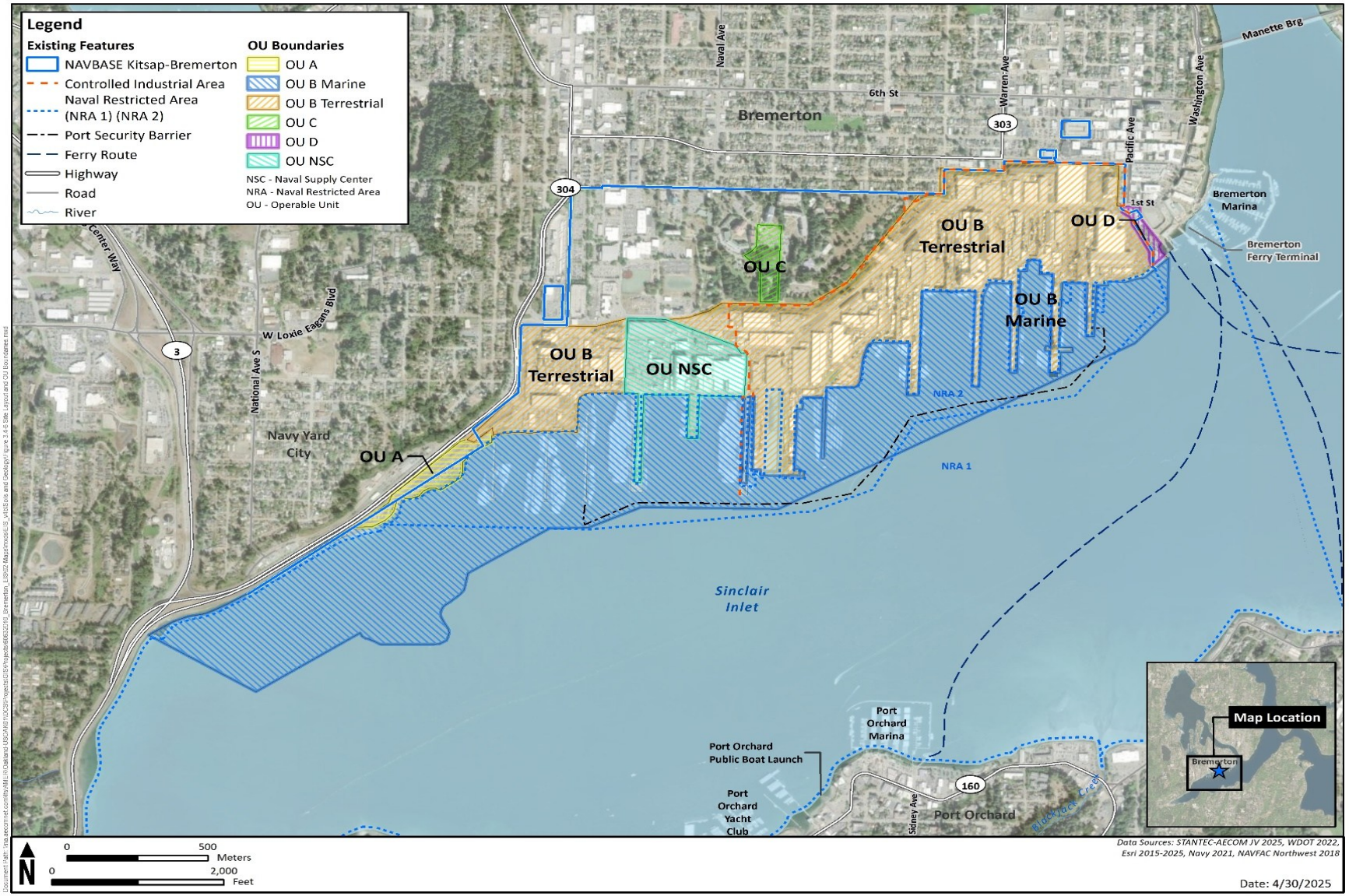

Figure 3.4-4 Site Layout and OU Boundaries

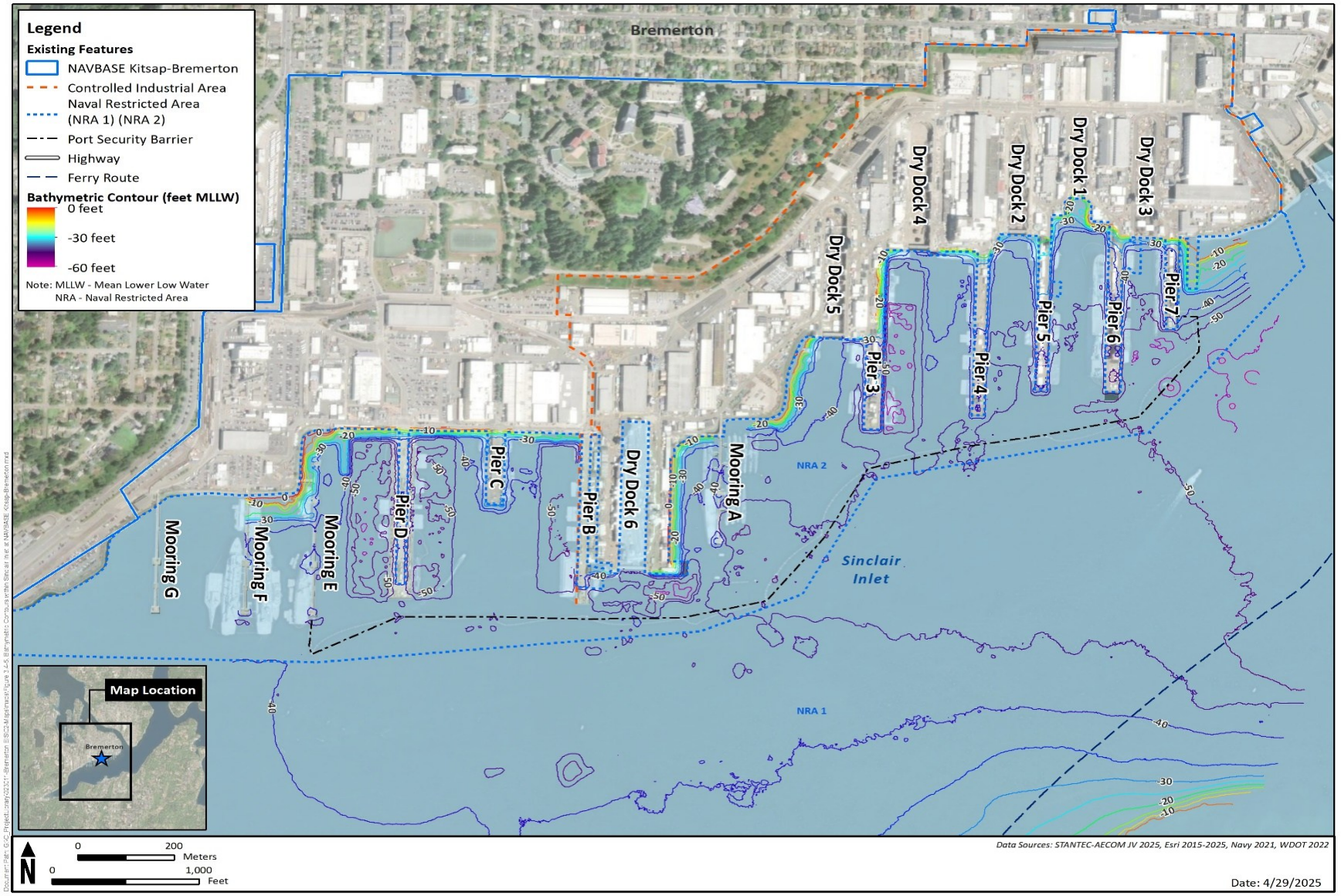

Figure 3.4-5 Bathymetric Contours within Sinclair Inlet at NAVBASE Kitsap-Bremerton

Marine Sediment

Silt and clay dominate nearshore sediment along the north shore of Sinclair Inlet and in the central inlet, while sediment along the south shore are predominantly sandy. Coarser sediment is only present in intertidal areas affected by significant wave action (Navy et al. 2000). Existing sedimentation rates in Sinclair Inlet range from 0.2 to 0.8 inch per year (Navy et al. 2000). Concentrations of total organic carbon in sediment within Sinclair Inlet range from 0.5 to 7.9 percent (Navy et al. 2000).

Remedial investigations have documented sediment contamination within Sinclair Inlet, including the project area. The Navy, in cooperation with the EPA and Ecology, carried out remedial actions to address contaminated sediment offshore of NAVBASE Kitsap-Bremerton in accordance with a ROD issued under CERCLA (Navy et al. 2000). The National Priorities List identifies the site as the Puget Sound Naval Shipyard Superfund Site, which consists of six OUs (see Figure 3.4-4).

OU B includes terrestrial and marine areas. The marine portion of OU B (OU B Marine), which contains contaminated sediment, consists of approximately 230 acres of subtidal land. The area designated for remedial action under CERCLA extends up to 1,500 feet offshore from the terrestrial portions of NAVBASE Kitsap-Bremerton at elevations down to approximately -40 feet MLLW (Navy et al. 2000).

Elevated levels of polychlorinated biphenyls (PCBs) measured in the tissues of bottom-dwelling fish, which the EPA identified as posing an unacceptable risk to subsistence seafood consumers, was the primary reason for cleanup of OU B Marine. The OU B Marine ROD established remedial action objectives to reduce the concentration of PCBs in sediment to below the minimum cleanup level of 3 milligrams per kilogram (mg/kg) organic carbon in the biologically active zone (0–4 inch depth) and to selectively remove sediment with high concentrations of mercury collocated with PCBs (Navy et al. 2000).

The Navy implemented the main elements of the OU B Marine remedy in 2000 and 2001 in conjunction with navigation dredging (Figure 3.4-6). The OU B remedy included a combination of dredging with disposal in a Confined Aquatic Disposal (CAD) pit, capping, enhanced natural recovery, monitored natural recovery, and institutional controls. In 2004, the Navy, Ecology, and EPA issued an Explanation of Significant Differences to extend the boundary of OU B Marine to address impacted sediment that had been identified on Washington State Owned Aquatic Lands adjacent to the CAD pit (Navy et al. 2004b). The Navy implemented the selected response action for this area, enhanced natural recovery, in 2004 (Naval Facilities Engineering Systems Command [NAVFAC] Northwest 2020). Following remedy completion, the Navy conducted seven long-term monitoring events in 2003, 2005, 2007, 2010, 2012, 2014, and 2018. The 2018 sediment and fish tissue monitoring results demonstrated that remediation achieved the OU B Marine ROD cleanup objectives for PCBs (NAVFAC Northwest 2020). The Navy continues to conduct ongoing monitoring of the CAD pit and a Focused Feasibility Study is ongoing to address mercury contamination in OU B Marine sediment. The Focused Feasibility Study objectives are to identify potential sources of mercury, develop remedial action objectives that address potential unacceptable risk to human health and the environment posed by mercury, and evaluate remedial alternatives to address mercury-contaminated sediment and source control for mercury.

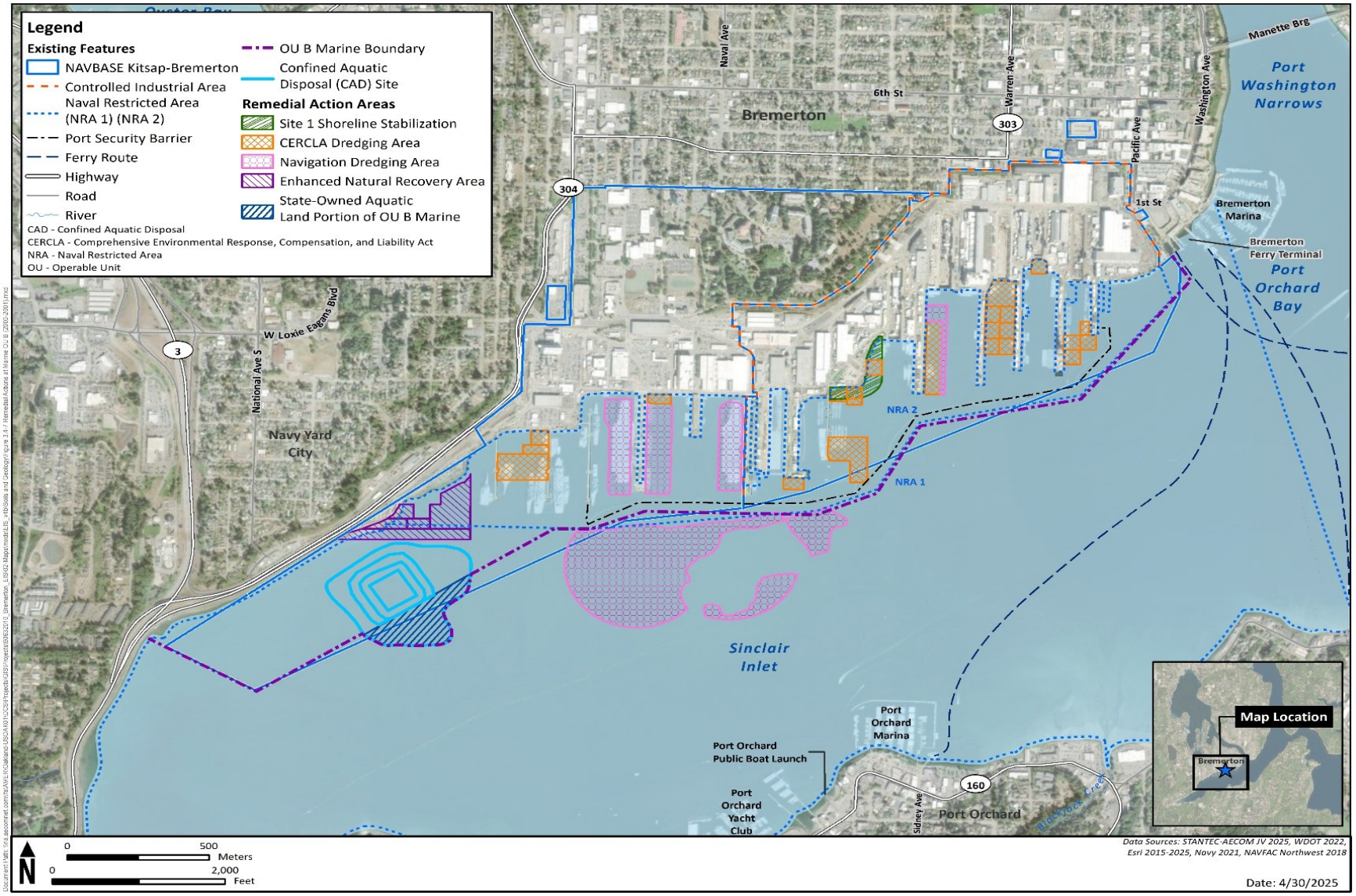

Figure 3.4-6 Remedial Actions at OU B Marine (2000–2001)

Sampling conducted in 2018 as part of the OU B Marine long-term monitoring program (NAVFAC Northwest 2020) shows that mercury in surface sediment (0–4 inches) within the Naval Restricted Area and in the greater Sinclair Inlet exceeds the Washington State Sediment Management Standards screening level of 0.41 mg/kg; however, total PCBs in surface sediment is below the Sediment Management Standards screening level of 0.130 mg/kg (Ecology 2013).[1]

Additionally, trend analysis of the long-term monitoring data indicate PCB concentrations in surface sediment have declined over time. The 2018 surface sediment data indicate that PCB Aroclors were non-detect in all of the samples. The geometric mean concentration of total PCBs was below the OU B Marine ROD long-term cleanup goal of 1.2 mg/kg organic carbon (NAVFAC Northwest 2020). Limited historic sediment core chemistry data indicate that the vertical extent of contamination is limited to the top 3 feet of the sediment below the sediment surface (Navy et al. 2000); however, limited analytical chemistry data are available for sediment below 6 inches.

Figure 3.4-7 and Figure 3.4-8 show the surface sediment mercury concentrations within Sinclair Inlet overlain by the proposed Alternative 2 and Alternative 3 action areas, respectively. Figure 3.4-9 and Figure 3.4-10 show the surface sediment total PCB concentrations within Sinclair Inlet overlain by the proposed Alternative 2 and Alternative 3, respectively.

[1] A comparison to Sediment Management Standards criteria is provided for information purposes only. Characterization of dredged material for the purpose of evaluating disposal options will be conducted in accordance with the Dredged Material Management Program's Dredged Material Evaluation and Disposal Procedures User Manual (DMMP, 2021).

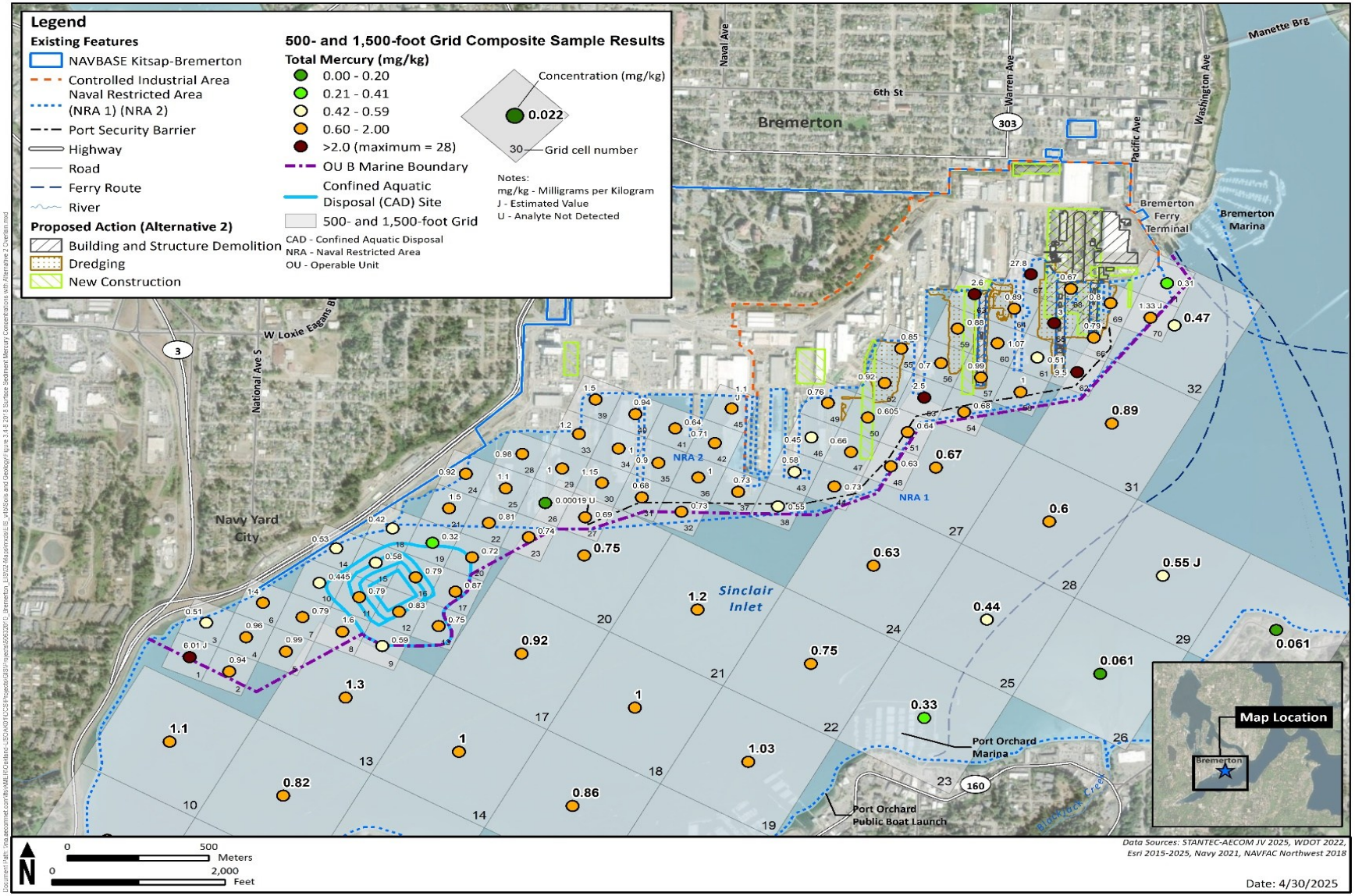

Figure 3.4-7 2018 Surface Sediment Mercury Concentrations with Alternative 2 Overlain

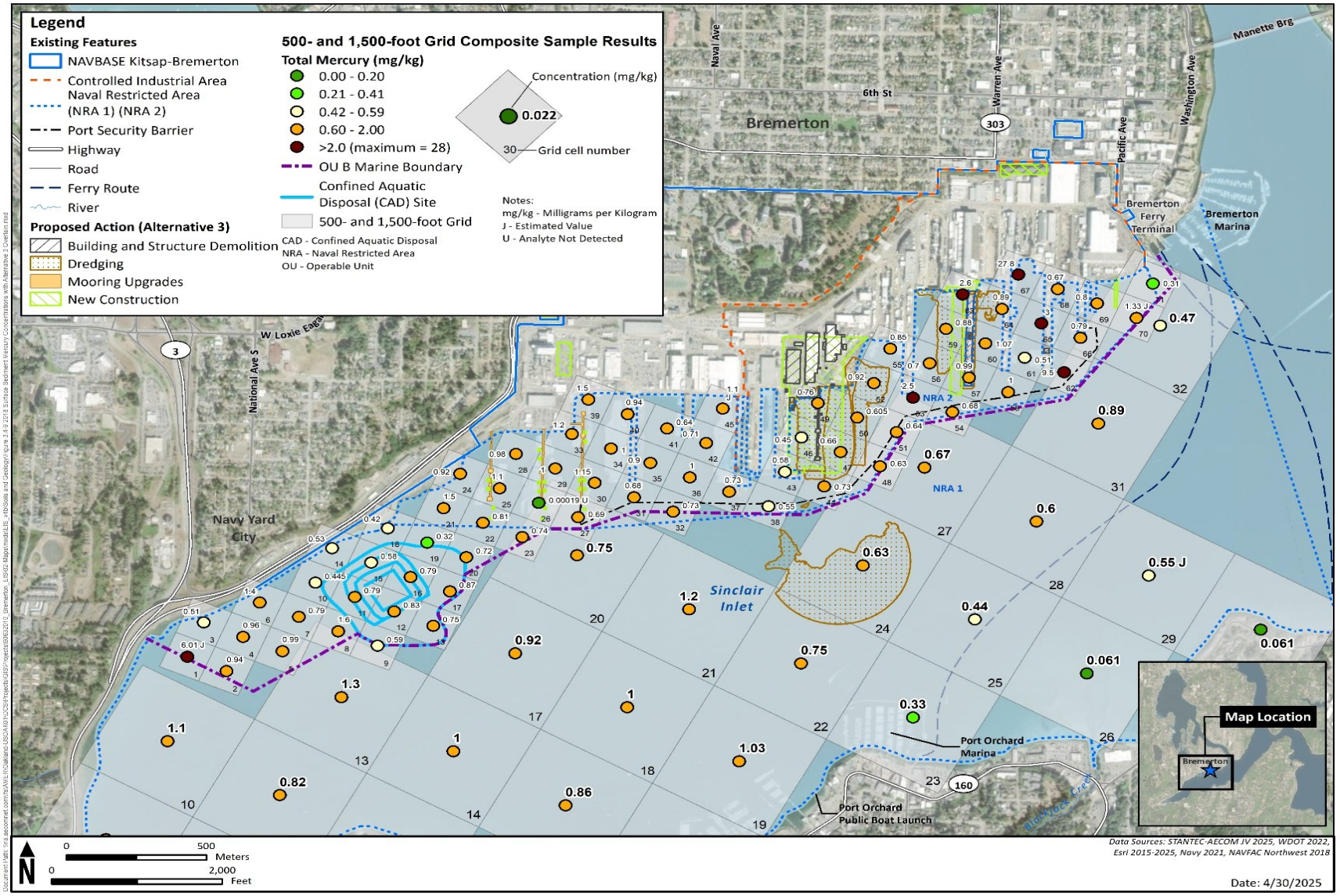

Figure 3.4-8 2018 Surface Sediment Mercury Concentrations with Alternative 3 Overlain

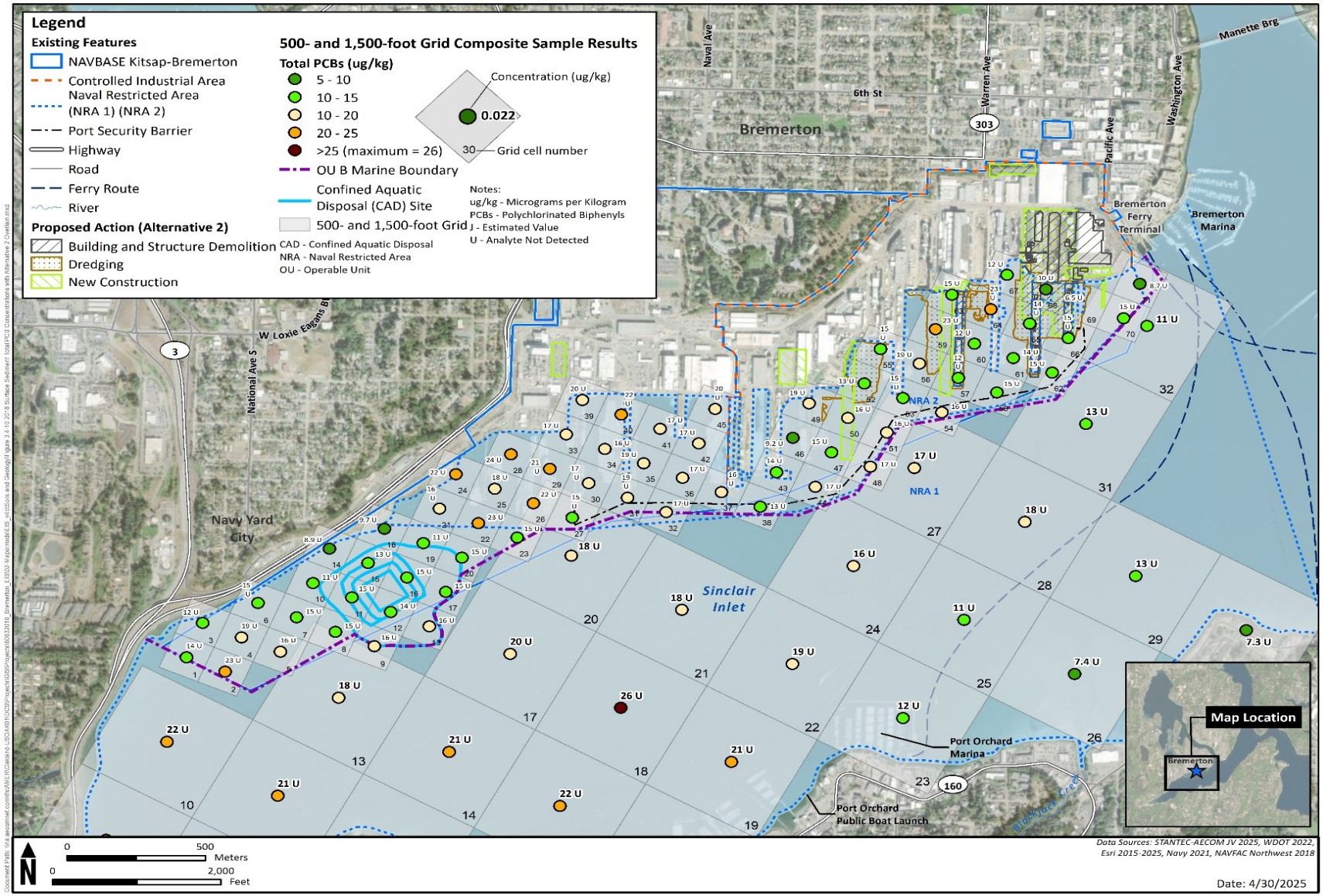

Figure 3.4-9 2018 Surface Sediment Total PCB Concentrations with Alternative 2 Overlain

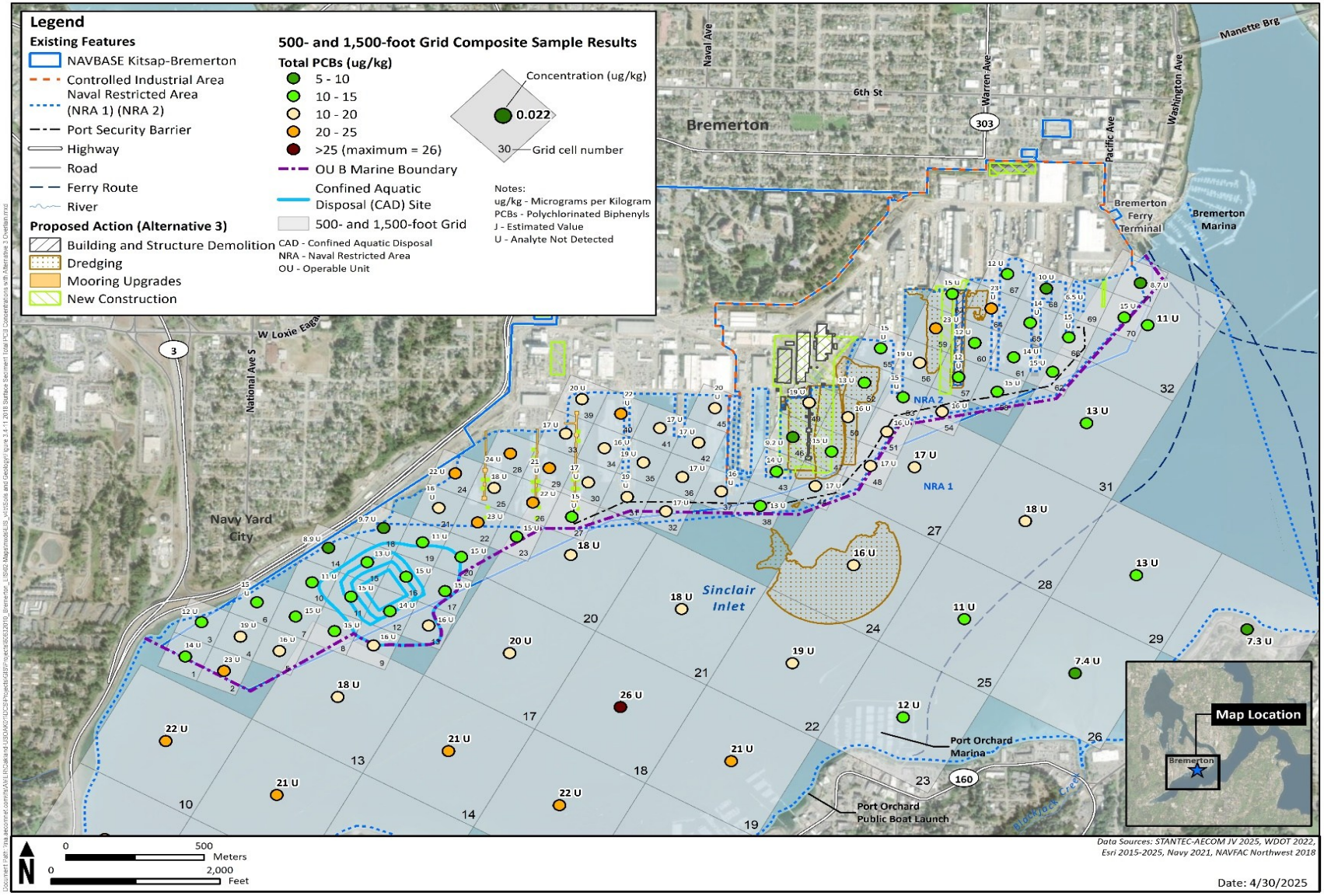

Figure 3.4-10 2018 Surface Sediment Total PCB Concentrations with Alternative 3 Overlain

NAVBASE Kitsap-Bangor

Topography

The topography at the NAVBASE Kitsap-Bangor project areas includes rolling uplands with slopes ranging from 0 to 35 percent (Natural Resources Conservation Service 2022). Elevations at the NAVBASE Kitsap-Bangor project areas range from approximately 350 to 400 feet above mean sea level. The project area has not been identified as being susceptible to landslide hazards (Kitsap County 2017a).

Geology

NAVBASE Kitsap-Bangor is located within the remnant of a glacial-drift plain. The Vashon Glacier of the Pleistocene period deposited sedimentary layers of Vashon drift till and outwash deposits across the region, and as a result, glacial clay, silt, sand, and gravel underlie the upland areas of the installation (Figure 3.4-1) (Navy 2018).

The NAVBASE Kitsap-Bangor project areas are subject to seismic shaking associated with the faults/subduction zones described above but are not located along an active fault (Kitsap County 2017b). These project areas are located outside of the tsunami inundation zone and are in an area with no susceptibility to liquefaction (Kitsap County 2017b).

Soil

Soils of the Alderwood-Indianola complex underlie the project areas at NAVBASE Kitsap-Bangor (Figure 3.4-11). These soils are the remains of a glacial till, which is characterized by a moderately compacted till layer, 20–40 inches below the surface (Navy 2018). This is overlaying a very compacted till or hardpan layer on slopes ranging from 0 to 35 percent (Natural Resources Conservation Service 2022). Above the till layer, water can move relatively easily but does not penetrate through the till layer as fast, creating a high water table during the winter months when precipitation is at its greatest and increasing the chance of erosion of upper soils (Navy 2018). There are no prime farmlands in the NAVBASE Kitsap-Bangor project areas (Natural Resources Conservation Service 2022).

Bathymetry

Bathymetry at NAVBASE Kitsap-Bangor is not considered because the project area is located inland and away from Hood Canal.

Marine Sediment

Marine sediment at NAVBASE Kitsap-Bangor is not considered because the project area is located inland and away from Hood Canal.

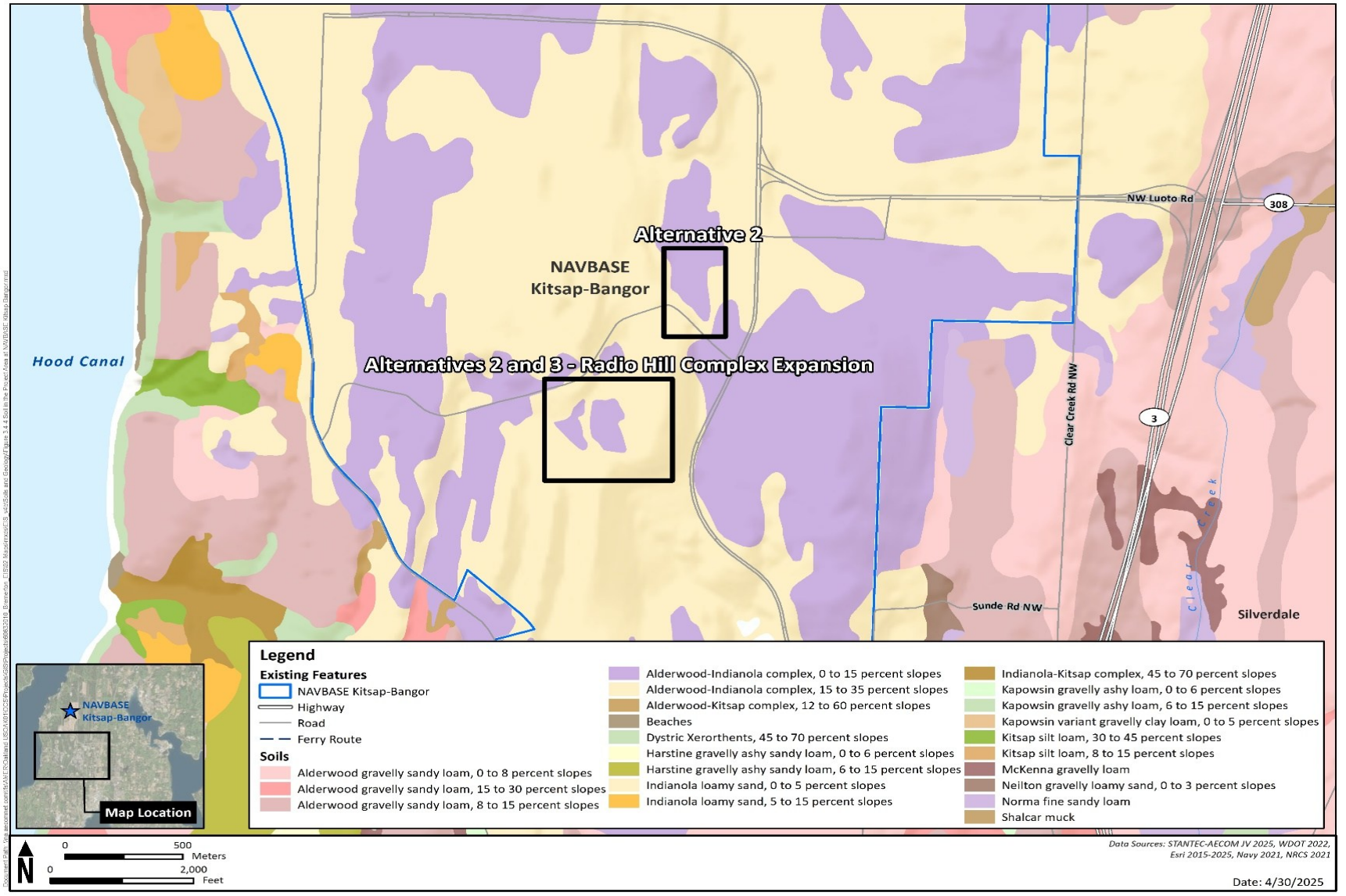

Figure 3.4-11 Soil in the Project Areas at NAVBASE Kitsap-Bangor

3.4.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Table 3.4-2 and Table 3.4-3 summarize the potential effects to geological resources associated with reasonably foreseeable future actions with a close causal relationship to the Proposed Action at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, respectively.

Table 3.4-2 Effects to Geological Resources from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Pier 3 Electrical Substation Repair, PSNS & IMF	Reasonably proximate by distance (1.3 miles) but scheduled to be complete before the Proposed Action construction is initiated. No overlap.	No relationship to the Proposed Action. No impacts to geological resources.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF and NAVBASE Kitsap-Manchester	Located within the NAVBASE Kitsap-Bremerton Proposed Action area and at NAVBASEL Kitsap-Manchester, approximately 5 miles east of the study area.	Construction would result in temporary resuspension of contaminated sediment. Impacts due to pile removal are addressed in Table 3.3-3 and would be minimized through implementation of BMPs. There could be a brief overlap with the Proposed Action construction activities. Phase I is scheduled to be completed in February 2026; Phase II would begin in July 2026. The Proposed Action is slated to begin in later 2026.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	Located approximately 5 miles east of PSNS & IMF.	No relationship to the Proposed Action. No impacts to geological resources in ROI.
Navy –SIOP, PSNS & IMF	Located within the NAVBASE Kitsap-Bremerton Proposed Action area.	SIOP would involve capital improvements which would involve construction. Some SIOP projects could overlap with the Proposed Action. Could increase potential erosion and sediment load entering Sinclair Inlet from stormwater runoff due to additional soil disturbance and excavation; impacts would be minimized through implementation of BMPs.
Navy – OU B Marine Source Removal Actions	Located within the NAVBASE Kitsap-Bremerton Proposed Action area.	Source removal efforts are expected to begin in 2027. Over time, this work would reduce mercury concentrations and generally improve sediment quality and water quality.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	A CERCLA investigation is ongoing in the Proposed Action area. The initial remedial investigation is scheduled to begin in 2025, with an additional remedial investigation is scheduled for 2028. The necessity and magnitude of a remedial action would be based on PFAS delineation and risk evaluation.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – OU A, OU B Terrestrial, and OU NSC CERCLA actions for PFAS	Located within or adjacent to the NAVBASE Kitsap-Bremerton Proposed Action area.	A CERCLA investigation is ongoing in the Proposed Action area. Initial remedial investigations are expected to begin in 2025-2026 with additional investigations between 2029 and 2033. The necessity and magnitude of a remedial action would be based on PFAS delineation and risk evaluation. Remedial investigation and remedial action work will be dependent on access during construction activities associated with the Proposed Action.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	The pavement project would be located approximately 2,000 feet north of the ROI.	Could increase potential erosion and sediment load entering Sinclair Inlet from stormwater runoff due to additional soil disturbance and excavation; impacts would be minimized through implementation of BMPs.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	The enhancement project would be located approximately 2,000–5,000 feet north of PSNS & IMF, between Burwell Street and 11th Street in Bremerton.	Could increase potential erosion and sediment load entering Sinclair Inlet from stormwater runoff due to additional soil disturbance and excavation; impacts would be minimized through implementation of BMPs.
Port of Bremerton – Marina Breakwater Replacement, Port Orchard Marina	The breakwater replacement project would be located approximately 4,000 feet south of PSNS & IMF, at the opposite shore of Sinclair Inlet.	Construction could result in temporary suspension of sediment into the water column, impacts would be minimized through implementation of BMPs.
Private Development – The Beacon and Beacon II	Located approximately 0.9 mile northeast of the NAVBASE Kitsap-Bremerton Proposed Action Areas in East Bremerton.	No relationship to the Proposed Action. No impacts to geological resources in the ROI.
Private Development – McWilliams Apartments	Located approximately 4 miles north of the NAVBASE Kitsap-Bremerton Proposed Action Areas in East Bremerton.	No relationship to the Proposed Action. No impacts to geological resources in the ROI.

Legend: BMP = best management practice; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; OU = Operable Unit; PFAS = per- and polyfluoroalkyl substances; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; ROI = Region of Influence; SIOP = Shipyard Infrastructure Optimization Program

Table 3.4-3 Effects to Geological Resources from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Transit Protection Program Support Facilities	Located approximately 4 miles north of the NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to geological resources in the ROI.
Navy – Child Development Center	Located approximately 2,200 feet southeast and 3,700 feet south of the NAVBASE Kitsap-Bangor Proposed Action Areas.	Could increase potential erosion and sediment load from stormwater runoff due to additional soil disturbance and excavation; impacts would be minimized through implementation of BMPs.
Navy – Military Working Dog Kennel Replacement	Located approximately 1,300 feet north and southeast of the NAVBASE Kitsap-Bangor Proposed Action Areas.	Could increase potential erosion and sediment load from stormwater runoff due to additional soil disturbance and excavation; impacts would be minimized through implementation of BMPs.
Navy – Repair Substation 5	Located approximately 3 miles north of the NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to geological resources in the ROI.
Navy – Tang Road Repair	Located approximately 4.5 miles north of the NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to geological resources in the ROI.
Navy – Equipment Processing Building	Located approximately 4 miles north of the NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to geological resources in the ROI.
Navy – Relocate Flier Road	Located approximately 5 miles north of the NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to geological resources in the ROI.
Navy – CERCLA actions for PFAS	Located within the NAVBASE Kitsap-Bangor Radio Hill complex Proposed Action Area.	A CERCLA investigation at the Radio Hill complex site determined all PFAS concentrations were below screening levels. Paving the area as part of the Proposed Action would reduce exposure to potentially contaminated soils.
Navy – CERCLA OU 1 Site A	Located approximately 4 miles north of the NAVBASE Kitsap-Bangor Proposed Action Areas.	No relationship to the Proposed Action. No impacts to geological resources in the ROI.
Navy – CERCLA OU 2 Site F	Located within the NAVBASE Kitsap-Bangor Forge Shop Proposed Action Area (access road only).	Due to overlap of only a small portion of the Forge Shop access road, there would be limited relationship to the Proposed Action.
Navy – Alternate Power Transmission Line	It would extend from a commercial electrical power source at Clear Creek Road to a Bangor substation. Exact location TBD.	TBD

Legend: BMP = best management practice; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; Ecology = Washington Department of Ecology; EPA = United States Environmental Protection Agency; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; OU = Operable Unit; PFAS = per- and polyfluoroalkyl substances; ROD = Record of Decision; ROI = Region of Influence; TBD = To Be Determined; UXO = unexploded ordnance

3.4.3 Environmental Consequences

This section discusses the potential impacts on geological resources from the no-action and action alternatives. The effects analysis evaluated the potential for beneficial or adverse impacts, accounting for best management practices (BMPs) that the Navy would implement as part of the Proposed Action (as listed in Table 3.3-5 and Table 3.4-4 for NAVBASE Kitsap-Bremerton and Table 3.3-6 and Table 3.4-5 for NAVBASE Kitsap-Bangor). The BMPs are measures that the Navy would implement to reduce the environmental impacts of the activities, functions, or processes of the proposed alternative. The potentially affected environment associated with geological resources is limited to areas that would be disturbed by any proposed facility development, dredging, or demolition.

Table 3.4-4 Geological Resources Best Management Practices for NAVBASE Kitsap-Bremerton

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
GEO MGMT BREM-1	Minimize the potential effects of seismically induced ground movement	New Structures: All new structures would be designed and constructed to comply with the seismic design criteria identified in the appropriate DoD UFC(s). The design and construction of dry docks will be consistent with the seismic design criteria under the DoD safety certification program – MIL-STD-1625D(SH) and the DoD UFC.	Construction
GEO MGMT BREM-2	Minimize the potential effects of tsunami inundation	Tsunami Hazards: Implementation of and adherence to shut-down and safety procedures during construction to minimize the impacts of tsunamis.	Construction and Operations

Legend: BMP = best management practice; DoD = Department of Defense; UFC = Unified Facilities Criteria

Table 3.4-5 Geological Resources Best Management Practices for NAVBASE Kitsap-Bangor

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
GEO MGMT BANGOR-1	Minimize the potential effects of seismically induced ground movement	New Structures: All new structures would be designed and constructed to comply with the seismic design criteria identified in the appropriate DoD UFC(s).	Construction

Legend: BMP = best management practice; DoD = Department of Defense; UFC = Unified Facilities Criteria

3.4.3.1 Nature and Type of Effects

Effects to topography from upland construction and demolition could occur if there is a change in drainage patterns, susceptibility to landslides, slope instability, or decreased stability of the shoreline. Effects on the geology related to seismicity and tsunamis could result in damage to or inundation of the construction area or new facilities. Effects on soil from upland construction could result in increased rates of soil erosion or sedimentation. Effects on bathymetry from dredging and marine demolition and construction would occur. Effects on marine sediment from dredging and marine demolition and construction would occur.

3.4.3.2 Impact Assessment Methodology

Geological resources are analyzed in terms of drainage, shoreline stability, soil erosion, sediment disturbance, and seismic activity. The analysis of topography and soil focuses on soil areas subject to disturbance, on the potential for soil erosion from construction areas, and on the potential for eroded soil to become pollutants in downstream surface waters during storm events. The analysis also examines potential impacts related to seismic hazards and seismic events.

The analysis of bathymetry and sediment focuses on areas where sediment would be disturbed and on the potential for sediment transport resulting from sediment disturbing activities. A hydrodynamic and sediment transport model was developed to evaluate sediment impacts associated with each project alternative under a range of tide and wind conditions (see Appendix H). The model simulated the transport of suspended sediment generated during in-water construction activities and predicted spatial and time-dependent levels of turbidity and depositional pattern of the mobilized sediment. The model evaluated key areas within Sinclair Inlet, including: OU B Marine, Charleston Beach, south Sinclair Inlet (Port Orchard) shoreline with recreational/commercial vessel moorage, and areas of concentrated underwater vegetation east of Pier 7 and near the outfall of Blackjack Creek.

There are no unique geological structures, potentially developable mineral resource deposits, or prime farmlands in the Proposed Action area; therefore, as none of the action alternatives would affect these resources, they are not evaluated further.

The evaluation of construction-related impacts and operation-related impacts to geological resources considers the degree to which the following could potentially occur:

- Changes to existing topography that could increase the potential for soil erosion and landslides
- Disturbance and dispersal of upland soil resulting from demolition and/or construction activities
- Changes to existing bathymetry that could increase the potential for sediment erosion or impact slope stability
- Disturbance and transport of sediment resulting from demolition, dredging, and/or construction activities
- Risk of earthquake-related injury and/or damage
- Risk from tsunamis

3.4.3.3 Impact Analysis for Alternative 1: No-Action

Under the no-action alternative, the Proposed Action would not occur, and there would be no effects to topography, soil, bathymetry, and marine sediment. Without upgrades to meet current seismic standards, most of the dry docks, piers, and wharves at PSNS & IMF are expected to perform poorly in seismic events, as described in Section 1.4.2.

3.4.3.4 Impacts Analysis for Alternative 2 (Preferred Alternative)

NAVBASE Kitsap-Bremerton

Construction-related Impacts

Topography

Under Alternative 2, the proposed demolition, construction, and modification of upland facilities at NAVBASE Kitsap-Bremerton, as identified in Section 2.3.2, would all occur within existing industrial areas that have been previously developed. Earthwork would be required for excavation, fill, grading, utility

trenching, and preparation of temporary construction laydown and staging areas. Overall, Alternative 2 would result in 896,250 cubic yards of upland excavation and 484,000 cubic yards of fill above MHHW, based on preliminary design estimates (see Table 2-9). Although excavation would occur in upland areas during construction, the topography would remain level when construction is complete. Construction personnel would install temporary retaining structures (i.e., shoring walls and quay walls) to limit the lateral extents of excavation, protect existing structures surrounding the excavation, and provide for groundwater cutoff to aid construction dewatering and permanent groundwater drainage. These measures would stabilize excavations and shorelines and reduce the potential for slope failure during construction. Upland excavation would modify drainage patterns during construction, but this would be managed using BMPs to route and manage stormwater in compliance with the construction stormwater NPDES permit (Table 3.3-4, WATER MGMT BREM-1 and -2).

With implementation of BMPs and temporary structures to stabilize slopes and manage changes to drainage patterns, short-term adverse effects to topography during construction are not expected under Alternative 2.

Geology

The NAVBASE Kitsap-Bremerton project area is in a seismically active region that is subject to periodic earthquake activity. Geotechnical investigations of the project area include engineering recommendations for new facilities. The southern trace of the U.S. Geological Survey -mapped Seattle Fault Zone is within the NAVBASE Kitsap-Bremerton project area. An earthquake on the Seattle Fault Zone can lead to surface rupture and vertical uplift along the fault. However, based on a probabilistic seismic hazard analysis that has been performed at the project site, vertical uplift of the site is not expected to cause significant damage beyond what would be caused by the ground shaking.

The design and construction of all new structures and facilities would comply with the seismic design criteria identified in the appropriate DoD Unified Facilities Criteria (UFC). The design and construction of dry docks would be consistent with the seismic design criteria under the DoD safety certification program – MIL-STD-1625D(SH) (DoD 2009) and the DoD UFC (DoD 2017, 2020) (Table 3.4-4, BMPs GEO MGMT BREM-1). The Navy would use standard seismic engineering design measures to minimize the potential effects of seismically induced ground movement, such as severe shaking, slope failure, and liquefaction. These measures include stabilization of mole fill soil through jet grouting; use of clean, angular ballast rock for new backfill; or through installation of sheet piles, quay walls, and steel/concrete pipe piles to reduce susceptibility to seismically induced liquefaction and flow failure (e.g., landslides).

The project area at NAVBASE Kitsap-Bremerton is within a tsunami inundation area, where destructive waves caused by extreme tsunamis could inundate portions of the project area during construction and operation. Implementation of and adherence to shut down and safety procedures during construction would minimize the impacts of tsunamis (Table 3.4-4, BMPs GEO MGMT BREM-2).

Through implementation of design standards and safety measures, there would be no increased risks of geologic hazards from construction work under Alternative 2.

Soil

Demolition of existing facilities and construction of new facilities at NAVBASE Kitsap-Bremerton would disturb upland areas with contaminated soil and groundwater; installation of utilities would require grading, excavation, and trenching. See Section 2.5.2 for areas of disturbance under Alternative 2. To minimize the short-term potential for increased erosion and sedimentation during construction, the Navy would implement appropriate erosion control BMPs in accordance with a project-specific

construction SWPPP and in compliance with coverage provisions under the construction stormwater NPDES permit (Table 3.3-4, BMPs WATER MGMT BREM-1 and -2). These measures would include a treatment system designed to remove suspended solids and contaminants prior to discharge to Sinclair Inlet.

Construction personnel would stockpile and dewater excavated contaminated and uncontaminated excavated material on-site within the excavation extents and then remove and dispose of excavated material in an approved off-site landfill(s) (see Section 3.3 for details on groundwater management and Section 3.14 for details on worker safety). This includes implementation of the following OU B Terrestrial remedial actions: excavation management and land use control plans, groundwater use restrictions, paving of unpaved areas, and repair of damaged pavement (Navy et al. 2004a). This reduction in contaminated soil in OU B Terrestrial may result in a long-term beneficial effect on groundwater and marine water quality.

With implementation of BMPs and removal of contaminated soil from OU B Terrestrial, short-term adverse effects to soil from construction under Alternative 2 are not expected and a long-term beneficial effect on groundwater and marine water quality would likely occur.

Bathymetry

Under Alternative 2, dredging would occur to establish adequate draft at wharves and piers, and as required for the demolition of existing structures. Riprap would be placed along the shoreline slopes to provide erosion protection and slope stability in areas where structures or quay walls are not constructed. Riprap provides more protection from erosional forces (i.e., water and wave action) than a soft engineered bank such as vegetation. Riprap sizing is subject to design calculations based on the slope angle and water velocity.

Although changes to the bathymetry from construction would be permanent, the bathymetry would remain similar to existing conditions and therefore long-term impacts would be negligible under Alternative 2. Impacts to marine biological resources related to the change in bathymetry are discussed in Section 3.5. Impacts related to dredging are discussed in the marine sediment section below.

Marine Sediment

In-water construction activities at NAVBASE Kitsap-Bremerton, including dredging and marine demolition and construction, would result in temporary suspension of sediment into the water column under Alternative 2. Table 3.4-6 compares in-water impacts of Alternatives 2 and 3 based on the current preliminary design. As shown in Table 3.4-6, the total volume of dredged material under Alternative 2 is less than the dredge volume under Alternative 3. The total number of piles to be installed and removed is greater under Alternative 2 than Alternative 3.

Table 3.4-6 Comparison of In-Water Impacts: Alternatives 2 and 3

Action	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
Total Dredge Area (acres)	36.92	69
Total Volume of Dredged Material (cubic yards)	867,450	1,651,000
Total Volume of Unsuitable Dredged Material (cubic yards)	Pending dredged material suitability determination	Pending dredged material suitability determination
Total Number of Permanent In-Water Piles to be Installed	5,410	3,303
Total Linear Feet of Permanent In-Water Sheet Piles to be Installed	1,950	1,665
Total Number of Existing Piles to be Removed	4,891	796
Total Number of Temporary Steel Pipe Piles	800	740
Total Linear Feet of Temporary Sheet Piles	350	900

Impacts from dredging would be short term and primarily limited to the work footprint. The use of BMPs as described in Table 3.4-4 would minimize the generation of suspended sediment as well as sediment transport. All in-water activities would comply with federal, state, and local laws and regulations referenced in Table 3.4-1, including in-water work during the period allowed under federal time-of-year restrictions for protected species (see Section 3.5.3) and water quality monitoring for compliance with turbidity parameters. Based on a project-specific sediment transport study (Appendix H), turbidity impacts associated with dredging and marine demolition and construction activities under both action alternatives are not expected to exceed applicable water quality criteria.

Section 3.3 discusses water quality impacts from turbidity during dredging and marine demolition and construction. Section 3.5 discusses impacts to benthic habitats and associated marine biological resources. Under Alternative 2, dredging within OU B Marine would remove contaminated sediment from within the dredging footprint, resulting in long-term beneficial effects by reducing the volume of contaminated sediment and reducing the surface sediment contaminant concentrations, resulting in a reduction in both ecological risk and human health risk across approximately 37 acres.

Dredged material would be dewatered as necessary to meet the disposal facility's acceptance criteria. Decanted water would be treated (filtered at minimum) and discharged in accordance with the project's water quality certification and NPDES permit. Dredged material characterized as suitable for open water disposal would be disposed of at the Elliott Bay Open Water Disposal Site. Unsuitable dredged material would be taken by barge to be offloaded at an upland site (Port of Seattle or Port of Tacoma), then transported by truck and/or train to a permitted landfill for disposal. Adverse effects associated with dredged material transport and disposal would be negligible through compliance with all required permits/authorizations and applicable regulations. With implementation of BMPs and removal of contaminated sediment from OU B Marine, short-term adverse effects to water quality from construction under Alternative 2 are not expected and a long-term beneficial effect on marine sediment quality, surface water quality, and biota would likely occur.

Operation-related Impacts

There would be no additional permanent or long-term disturbance of topography, geology, soil, bathymetry, or marine sediment at NAVBASE Kitsap-Bremerton under Alternative 2 following construction. Installation of new quay walls, sheet pile walls, and riprap at NAVBASE Kitsap-Bremerton would improve shoreline stability. Shoreline stability would increase under Alternative 2 with hardening

of shoreline between DD5 and DD6 associated with Pier 2. These improvements to shoreline stability would reduce the potential for migration of contaminated soil to the marine environment, consistent with the remedial action objectives identified in the OU B Terrestrial ROD (Navy et al. 2004a). Based on a previous sediment study, sediment erosion and transport within Sinclair Inlet occurs to a limited extent; therefore, sediment accumulation is expected to be minimal (NAVFAC Northwest 2007). The Navy does not anticipate the need for maintenance dredging under Alternative 2.

Because the design and construction of all new structures would adhere to seismic design criteria identified in the appropriate DoD UFC(s) and design and construction of dry docks would be consistent with the seismic design criteria under the DoD safety certification program—MIL-STD-1625D (SH) and the DoD UFC (Table 3.4-4, BMPs GEO MGMT BREM-1), there would be a decrease in the probability of facility damage from a seismic event. As discussed in Section 2.3, project design would raise the coping/pier deck heights of the proposed new facilities to account for future sea level rise, which would reduce the potential for impacts from tsunami inundation along the waterfront. Proposed seismic upgrades would reduce the risk of impacts due to seismically induced liquefaction and flow failure (e.g., landslides).

With implementation of BMPs and overall improvements to shoreline stability, long-term adverse effects to geological resources associated with operation of the proposed facilities are not expected under Alternative 2.

NAVBASE Kitsap-Bangor

Construction-related Impacts

Topography

Construction activities associated with the Radio Hill complex expansion at NAVBASE Kitsap-Bangor would include clearing of trees, grading, excavating, and filling. Some of the areas have been previously disturbed and are level. Slopes would be stabilized by constructing retaining walls behind the two new buildings (employee building and work building) and terracing would likely be required at the new storage area. These measures would minimize the impacts associated with landslides. Construction of the forge shop at NAVBASE Kitsap-Bangor would include clearing of trees, grading, excavating, and filling. This location is relatively level and would not require slope stabilization. With construction of temporary structures to stabilize slopes and manage changes to drainage patterns, short-term adverse effects to topography during construction are not expected under Alternative 2.

Geology

The NAVBASE Kitsap-Bangor project area is in a seismically active region that is subject to periodic earthquake activity but is not in an area subject to liquefaction or tsunami inundation. The design and construction of all new structures and facilities would comply with the seismic design criteria identified in the appropriate DoD UFC(s) (Table 3.4-5, BMPs GEO MGMT BANGOR-1). Retaining walls and terracing would stabilize slopes at the Radio Hill complex expansion at NAVBASE Kitsap-Bangor. Through implementation of design standards and safety measures, there would be no increased risks of geologic hazards from construction work under Alternative 2.

Soil

Construction activities associated with the Radio Hill complex expansion and forge shop at NAVBASE Kitsap-Bangor would also disturb soils through clearing of trees, grading, excavating, and filling. To minimize the short-term potential for increased erosion and sedimentation during construction, the Navy would implement appropriate erosion control BMPs in accordance with a project-specific

construction SWPPP and in compliance with coverage provisions under the NPDES construction stormwater general permit (Table 3.4-5, BMPs WATER MGMT BANGOR-1). With implementation of BMPs, short-term adverse effects to soil from construction under Alternative 2 are not expected and a long-term beneficial effect on groundwater and marine water quality would likely occur.

Operation-related Impacts

There would be no additional permanent or long-term disturbance of topography, geology, or soil at NAVBASE Kitsap-Bangor under Alternative 2 following construction. Retaining walls and terracing would stabilize slopes at the Radio Hill complex expansion. Because the design and construction of all new structures would adhere to seismic design criteria identified in the appropriate DoD UFC(s) (Table 3.4-5, BMPs GEO MGMT BANGOR-1), there would be a decrease in the probability of facility damage from a seismic event. With implementation of BMPs a, long-term adverse effects to geological resources associated with operation of the proposed facilities are not expected under Alternative 2.

Effects Associated with Reasonably Foreseeable Future Actions

Construction

Temporary structures to stabilize slopes and shorelines and implementation of soil erosion control BMPs during construction would reduce susceptibility to weather events. Potential increases in sea level would not affect relatively near-term construction activities. Reasonably foreseeable future actions involving construction activities would also implement appropriate BMPs to stabilize slopes and shorelines and minimize soil erosion (Table 3.3-5, Table 3.3-6, and Table 3.4-5) to minimize impacts to geological resources.

Operation

As described in Section 2.3, the coping/pier deck heights of proposed new facilities have been raised to account for potential future sea level rise. This would result in some reduced impacts on the expansion of tsunami inundation areas in relation to sea level rise.

3.4.3.5 Impact Analysis for Alternative 3

NAVBASE Kitsap-Bremerton

Construction-related Impacts

Topography
Under Alternative 3, proposed demolition, construction, and modification of upland facilities at NAVBASE Kitsap-Bremerton would be similar to those under Alternative 2 (Section 3.4.3.4) and result in minimal changes to the already level topography. Additional facilities under Alternative 3 (i.e., construction of new parking garage at NAVBASE Kitsap-Bremerton) would result in minimal changes to the already level topography.

Overall, Alternative 3 would involve less excavation than Alternative 2, with approximately 713,000 cubic yards of upland excavation, but increased upland fill with approximately 694,000 cubic yards of fill above MHHW, based on preliminary design estimates (see Table 2-9). Construction personnel would manage changes to drainage patterns and stabilize shorelines and reduce the potential for slope failure and landslides during construction at NAVBASE Kitsap-Bremerton, as described in Section 3.4.3.4.

With implementation of BMPs (Table 3.3-5, WATER MGMT BREM-1 and -2) and temporary structures to stabilize slopes and manage changes to drainage patterns, short-term adverse effects to topography from construction under Alternative 2 are not expected.

Geology

As described in Section 3.4.3.4, the design and construction of all new structures and facilities under Alternative 3 would comply with the seismic design criteria identified in the appropriate DoD UFC(s). The design and construction of dry docks would be consistent with the seismic design criteria under the DoD safety certification program – MIL-STD-1625D (SH) and the DoD UFC (Table 3.4-4, BMPs GEO MGMT BREM-1). Implementation of shutdown and safety procedures during construction would minimize the impacts of tsunamis (Table 3.4-4, BMPs GEO MGMT BREM-2). Therefore, through implementation of design standards and safety measures, there would be no increased risks of geologic hazards from construction work under Alternative 3.

Soil

Under Alternative 3, demolition and construction of facilities at NAVBASE Kitsap-Bremerton would disturb upland areas with contaminated soil and groundwater; installation of utilities would require grading, excavation, and trenching. See Section 2.5.2 for areas of disturbance under Alternative 3. As described in Section 3.4.3.4, a SWPPP would be prepared and the Navy would implement appropriate erosion control BMPs in compliance with the construction stormwater NPDES permit (Table 3.3-5, BMPs WATER MGMT BREM-1 and -2). These measures would include a treatment system designed to remove suspended solids and contaminants prior to discharge to Sinclair Inlet.

Construction personnel would manage and dispose of contaminated and uncontaminated excavated material in an approved off-site landfill(s), as described in Section 3.4.3.4. This reduction in contaminated soil in OU B Terrestrial may result in a long-term beneficial effect on groundwater and marine water quality.

With implementation of BMPs and removal of contaminated soil from OU B Terrestrial, short-term adverse effects to soil from construction under Alternative 3 are not expected and a long-term beneficial effect on groundwater and marine water quality may occur.

Bathymetry

Dredging under Alternative 3 would permanently alter bathymetry; however, the seafloor topography would remain relatively flat, consistent with existing conditions. Riprap would be placed along the shoreline slopes to provide erosion protection and shoreline stability in areas where structures or quay walls are not constructed.

Impacts to seafloor topography from construction under Alternative 3 would be permanent but negligible since the post-construction seafloor topography would be consistent with existing conditions. Impacts to marine biological resources related to the change in bathymetry from construction under Alternative 3 are discussed in Section 3.5.

Marine Sediment

Compared to Alternative 2, in-water work under Alternative 3 would involve the removal of a greater volume of unsuitable and suitable dredged material, but the installation and removal of fewer piles. Pile and dredge quantities are summarized in Table 3.4-6.

Dredging duration would be shorter under Alternative 3 than under Alternative 2. As previously noted, the duration of pile driving and removal activities is similar under both action alternatives. Under

Alternative 3, dredging within OU B Marine would remove contaminated sediment from 69 acres and result in reduced surface sediment concentrations from within the dredge footprint, resulting in long-term beneficial effects including a reduction in both the ecological risk and human health risk posed by contaminant concentrations. Alternative 3 results in the removal of a greater volume of contaminated sediment across a greater area than Alternative 2. Water quality impacts would be localized and temporary. Throughout the project, water quality monitoring would be implemented to ensure compliance with state water quality standards. With implementation of BMPs during dredging, Navy expects minimal short-term adverse impacts.

Operation-related Impacts

Operation-related impacts to geological resources would be similar to those described for Alternative 2 (Section 3.4.3.4). Improvements to shoreline stability would reduce the potential for migration of contaminated soil to the marine environment, consistent with the remedial action objectives identified in the OU B Terrestrial ROD (Navy et al. 2004a). With implementation of BMPs and overall improvements to shoreline stability, long-term adverse effects to geological resources associated with operation of the proposed facilities are not expected under Alternative 3.

NAVBASE Kitsap-Bangor

Construction-related Impacts

Topography
Construction activities associated with the Radio Hill complex expansion at NAVBASE Kitsap-Bangor would include clearing of trees, grading, excavating, and filling. Construction personnel would manage changes to drainage patterns and reduce the potential for slope failure and landslides during construction at NAVBASE Kitsap-Bangor, as described in Section 3.4.3.4. With construction of temporary structures to stabilize slopes and manage changes to drainage patterns, short-term adverse effects to topography during construction are not expected under Alternative 3.

Geology
As described in Section 3.4.3.4, the design and construction of all new structures and facilities under Alternative 3 would comply with the seismic design criteria identified in the appropriate DoD UFC(s) (Table 3.4-5, BMPs GEO MGMT BANGOR-1). Therefore, through implementation of design standards, there would be no increased risks of geologic hazards from construction work under Alternative 3.

Soil
Impacts to soils from construction activities associated with the Radio Hill complex expansion at NAVBASE Kitsap-Bangor would be the same as described in Section 3.4.3.4., but with reduced impacts without construction of the forge shop under Alternative 3. To minimize the short-term potential for increased erosion and sedimentation during construction, the Navy would implement BMPs in compliance with the NPDES construction stormwater general permit (Table 3.3-6, BMPs WATER MGMT BANGOR-1).

With implementation of BMPs, short-term adverse effects to soil from construction under Alternative 3 are not expected and a long-term beneficial effect on groundwater and marine water quality may occur.

Operation-related Impacts

There would be no additional permanent or long-term disturbance of topography, geology, or soil at NAVBASE Kitsap-Bangor under Alternative 3 following construction. Operation-related impacts to

geological resources would be similar to those described for Alternative 2 (Section 3.4.3.4). Because design and construction of all new structures would adhere to seismic design criteria identified in the appropriate DoD UFC(s) (Table 3.4-5, BMPs GEO MGMT BANGOR-1), there would be a decrease in the probability of facility damage from a seismic event. With implementation of BMPs, long-term adverse effects to geological resources associated with operation of the proposed facilities are not expected under Alternative 3.

Effects Associated with Reasonably Foreseeable Future Actions

Effects from reasonably foreseeable future actions that may impact geological resources during construction and operation would be similar to those described for Alternative 2 (Section 3.4.3.4).

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3.5 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are referred to generally as vegetation, and animal species are referred to generally as wildlife. Habitat can be defined as the resources and conditions present in an area that support a plant or animal.

Within this EIS, biological resources are discussed for NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor. Terrestrial biological resources discussed at NAVBASE Kitsap Bremerton are divided into two categories: (1) vegetation, and (2) wildlife. Marine biological resources at NAVBASE Kitsap-Bremerton are divided into five categories: (1) marine mammals, (2) marine birds, (3) marine vegetation, (4) marine invertebrates, and (5) fishes (including marine and anadromous fish). Because there is no in-water work proposed at NAVBASE Kitsap-Bangor, no marine biological resources are discussed. Terrestrial biological resources at NAVBASE Kitsap-Bangor are divided into two categories: (1) vegetation, and (2) wildlife.

Species that are listed under the Endangered Species Act (ESA) as threatened or endangered and their designated critical habitat, as well as species protected under the Marine Mammal Protection Act (MMPA) that are not ESA-listed are discussed in their respective categories within this section. The ESA defines a threatened species as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." An endangered species is "any species which is in danger of extinction through all or a significant portion of its range" (NMFS 2022a). When a species is listed under ESA, NMFS and/or USFWS are required to determine whether there are areas that meet the definition of critical habitat. Critical habitat is defined as (1) specific areas within the geographical area occupied by the species at the time of listing that contain physical or biological features (PBFs) essential to conservation of the species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation (NMFS 2022a). Potential

impacts to critical habitat are assessed by determining the effects of the project on the PBFs of the critical habitat. PBFs are defined as sites or habitat components that support one or more life stages deemed essential to the conservation of the species (NMFS 2022a).

The MMPA prohibits any person or vessel from "taking" marine mammals in the United States or the high seas without authorization. The MMPA defines "take" as "to harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill any marine mammal." ESA-listed species and MMPA-protected species are analyzed in this EIS as required under NEPA. The Navy has initiated ESA section 7 consultation with NMFS and USFWS for impacts to threatened or endangered species and their designated critical habitat as a result of the Proposed Action. An Essential Fish Habitat (EFH) consultation, which evaluates impacts to EFH as defined under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), is being conducted concurrently with the ESA consultation with NMFS for this action. A summary of EFH present can be found in Appendix L. The Navy is preparing a Letter of Authorization (LOA) application for the incidental harassment of marine mammals under the MMPA for the first five years of construction and will apply for subsequent authorizations for the remaining years of construction activity. Completed consultations with NMFS and USFWS will be included as an appendix to the Final EIS.

In order to maintain consistency with documents being developed for consultation and coordination with NMFS and USFWS, both English and metric units are utilized in Section 3.5 for reporting values.

3.5.1 Regulatory Setting

Table 3.5-1 provides a list of the existing regulatory environment for biological resources at NAVBASE Kitsap-Bangor and NAVBASE Kitsap-Bremerton, Washington. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.5-1 Regulatory Setting for Biological Resources

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
Endangered Species Act	16 U.S.C. section 1531 *et seq*.
Marine Mammal Protection Act	16 U.S.C. section 1361 *et seq*.
Fish and Wildlife Coordination Act	16 U.S.C. section 661 *et seq.*
Magnuson-Stevens Fishery Conservation and Management Act and Sustainable Fisheries Act	16 U.S.C. section 1801 *et seq.*
National Invasive Species Council	Executive Order No.13112, (1999)
Safeguarding the Nation from the Impacts of Invasive Species	Executive Order No. 13751, (2016)
Nonindigenous Aquatic Nuisance Prevention and Control Act	16 U.S.C. section 472 *et seq.*
Migratory Bird Treaty Act	16 U.S.C. section 703-712
Responsibilities of Federal Agencies to Protect Migratory Birds	Executive Order No. 13186, (2001)
Bald and Golden Eagle Protection Act	16 U.S.C. section 668-668d
Sikes Act	16 U.S.C. sections 670a-670o, 74 Stat. 1052, 1960
Rivers and Harbors Act section 10, CWA section 404	33 U.S.C. 401 *et seq*.
CWA sections 402 and 404 NPDES; Section 316(b) for minimization of entrainment of marine biological resources in the saltwater intakes	33 U.S.C. section 1251 *et seq*.

Law, Regulation, or Guidance	*Regulatory Citation*
Marine Protection, Research and Sanctuaries Act	33 U.S.C. sections 103 - 107

Legend: CWA = Clean Water Act; EO = Executive Order; NPDES = National Pollutant Discharge Permit; U.S.C. = United States Code

3.5.2 Affected Environment

The following subsections describe existing conditions of the Bremerton Waterfront Infrastructure Improvements ROI for biological resources, which encompass biological resources at NAVBASE Kitsap-Bangor and at NAVBASE Kitsap-Bremerton (Figure 3.5-1). The ROI is divided into the following four parts:

- Demolition, Construction, Operations at NAVBASE Kitsap-Bremerton - includes the project area footprint, adjacent nearshore and marine environment of Sinclair Inlet, and analysis area that would extend into Sinclair Inlet to the furthest extent of effects from underwater noise (presumably during vibratory pile driving) and would encompass an approximately 6-square-mile (15-square-kilometer) area (Figure 3.5-2). Operations would occur within the PSB/NRA#2 (Figure 3.5-2).
- Caisson Delivery Transit Route - The two new M2D2 caissons may be pre-fabricated in Norfolk, Virginia and be transported on two separate trips via heavy tow dedicated vessels from Norfolk, VA to Bremerton, WA. These two trips would be months to years apart. The route would be up to 7,082 nautical miles (13,116 kilometers) long, passing through the Panama Canal and north along the West Coast to Washington State (Figure 3.5-1).
- Open-Water Dredged Disposal Site and Contractor Multi-use Site(s) Routes - Dredged sediment suitable for open water disposal would be transported via barge to the permitted, open-water Elliott Bay Disposal Site, located approximately 14.3 nautical miles (26.5 kilometers) from NAVBASE Kitsap-Bremerton. Dredged and demolition materials not suitable for open water disposal would be dewatered (as needed) to meet the disposal facility's acceptance criteria. Decant water from dewatering would be treated (filtered at minimum) and discharged in accordance with the project's water quality certification and NPDES permit. Decant water may also be containerized and transported via barge for off-site disposal via the Contractor Multi-use Site Transit Routes to an approved disposal facility at Port of Seattle and/or Port of Tacoma, 15.1 nautical miles (28 kilometers) and 27.6 nautical miles (51 kilometers), respectively (Figure 3.5-1).
- NAVBASE Kitsap-Bangor Radio Hill Complex Expansion Area, Forge Shop Construction, and Operations – Includes upland portions of NAVBASE Kitsap-Bangor for expansion of Radio Hill complex and construction of a new forge shop, parking area, and road. Operations would include use of the Radio Hill complex and new forge shop (Figure 3.5-1).

3.5.2.1 Existing Conditions

There are nine ESA-listed species that may be present within the NAVBASE Kitsap-Bremerton Demolition, Construction, Operations, and NAVBASE Kitsap-Bangor Radio Hill complex expansion area, new forge shop, and Operations; and Dredged Materials Disposal and Contractor Multi-use Site(s) Transit routes of the ROI. Up to 39 ESA-listed species (12 species of marine mammals, 1 invertebrate candidate species, 6 species of sea turtles, 6 bird species, and 16 fish species) may be present along the Caisson Delivery Transit Route. Table 1-1 and Table 1-2 of Appendix I list all ESA-listed species that may occur within the ROI; the Navy is consulting with NMFS and USFWS on project activities that may affect these ESA-listed species or their critical habitats.

NAVBASE Kitsap-Bremerton ROI Terrestrial Biological Resources

Vegetation

The upland area of NAVBASE Kitsap-Bremerton is primarily paved industrial and administrative with maintained landscaped areas around buildings. Within the landscaped areas of the housing and administrative portions of the installation, the primary coniferous trees include Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), and western white pine (*Pinus monticola).* Native deciduous tree species include red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), and Pacific madrone (*Arbutus menziesii*). Native understory plants such as Indian plum (*Oemleria cerasiformis*), elderberry (*Sambucus* sp.), salmonberry (*Rubus spectabilis*), and rhododendron (*Rhododendron macrophyllum*) as well as ornamental trees, fruit trees, and shrubs make up the remaining vegetation that occurs at the installation (Navy 2018).

Wildlife

Terrestrial wildlife that may be present at NAVBASE Kitsap-Bremerton are those common within developed areas within Kitsap County which include Douglas squirrel (*Tamiasciurus douglassi*), coyote (*Canis latrans*), opossum (*Didelphis virginianus*), raccoon (*Procyon lotor*), river otter (*Lutra canadensis*), and deer (*Odocoileus* spp.). Amphibians such as American bullfrog (*Lithobates catesbeianus*), common gartersnake (*Thamnophis sirtalis*), northwestern salamander (*Ambystoma gracile*), and Northern alligator lizard (E*lgaria coerulea*) may occur within the vegetated areas of the installation. Passerines and other birds that are associated with the upland vegetation that may be present at NAVBASE Kitsap-Bremerton include American robin (*Turdus migratorius*) , Hutton's vireo (*Vireo huttoni*), and northwestern crow (*Corvus caurinus*) (Navy 2018). Raptors such as bald eagles (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*) are also known to forage and nest in the region. Marine birds that are likely to occur along the waterfront of the installation include shorebirds, wading birds, marine waterfowl, and seabirds. Marine birds are described under the marine biological resources section below for NAVBASE Kitsap-Bremerton and a list is provided in Table 3.5-4 of that section.

NAVBASE Kitsap-Bremerton ROI Marine Biological Resources

Marine Mammals

All marine mammal species are protected under the MMPA, and many species are also listed under the ESA. Both NMFS and USFWS have jurisdiction over marine mammals potentially occurring within the Demolition and Construction, Operations, Open-Water Dredged Disposal Site and Contractor Multi-use Site(s) Routes, and Caisson Delivery Transit Route portions of the ROI. The respective ESA status of marine mammals with potential to occur within these areas is provided in Table 1-1 and Table 1-2 of Appendix I. As part of their administration of the MMPA, NMFS delineates regional stocks of each species for management purposes. For some of these species, NMFS has also identified Distinct Population Segments (DPSs) as part of establishing listing status under the ESA (Tables 1-1 and 1-2 of Appendix I). Table 3.5-2 shows marine mammal species and their potential timing and frequency of occurrence within the Demolition, Construction, and Operations and Open-Water Dredged Disposal Site and Contractor Multi-use Site(s) routes' ROI.

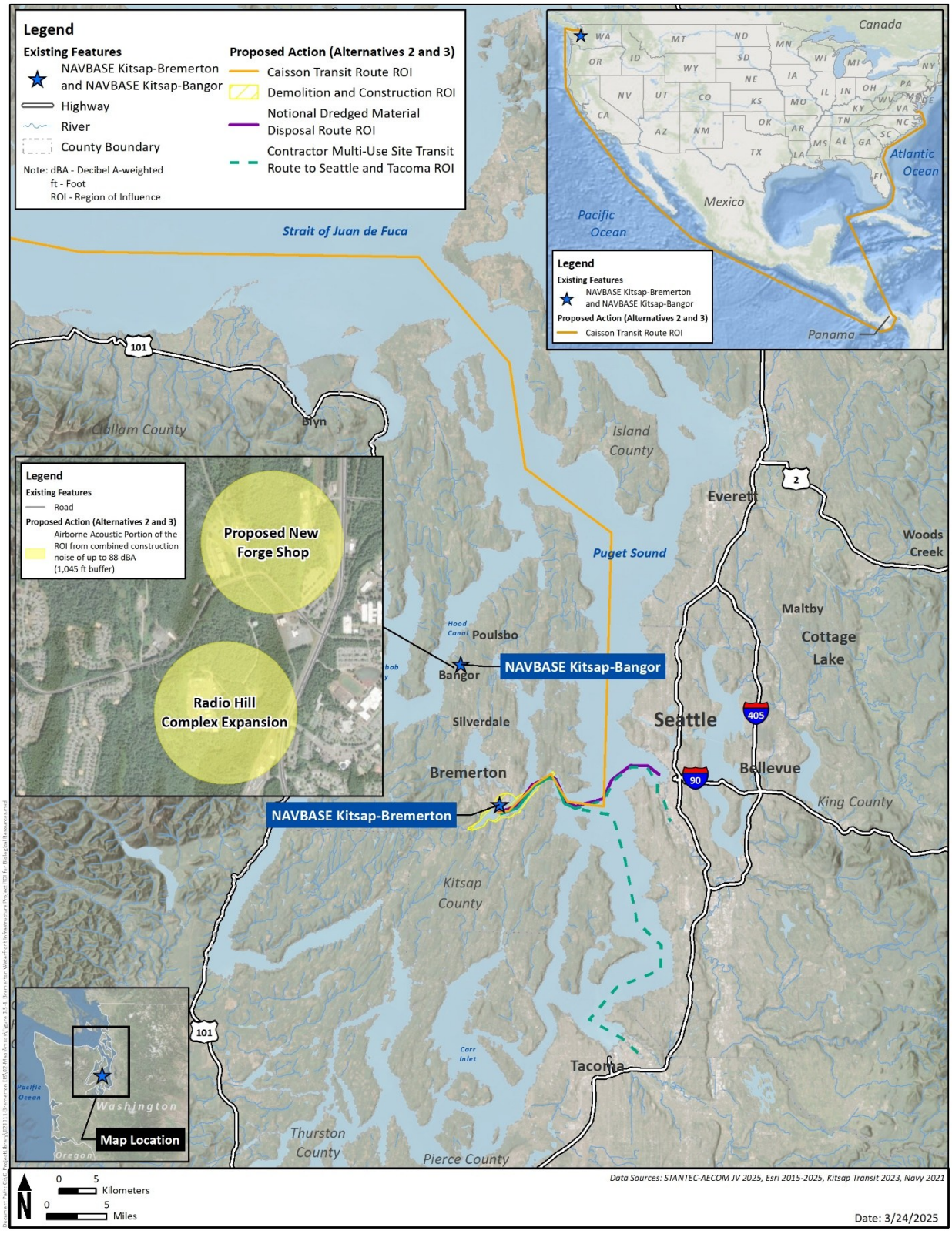

Figure 3.5-1 Bremerton Waterfront Infrastructure Project ROI for Biological Resources

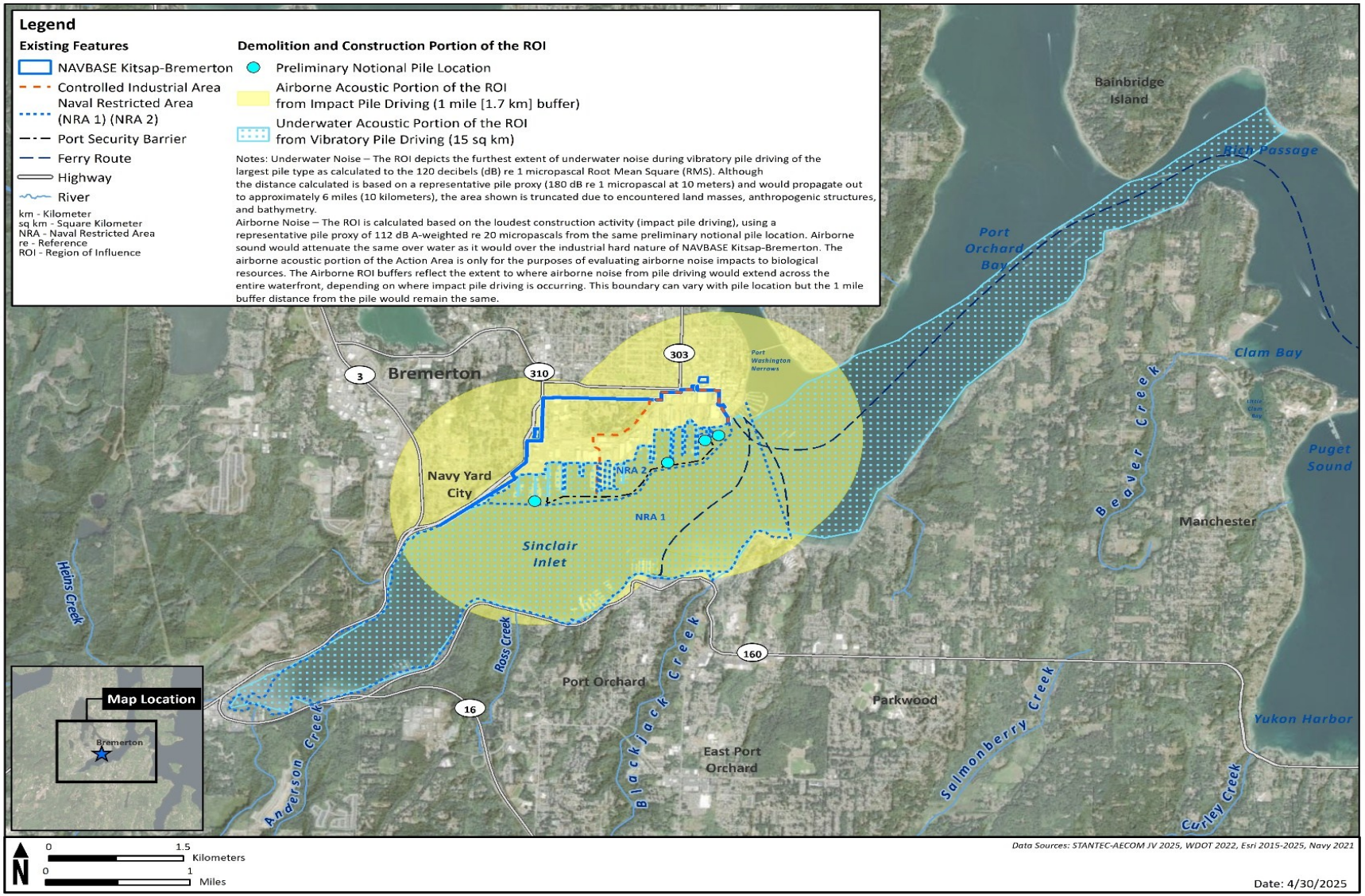

Figure 3.5-2 Demolition and Construction Portion of the ROI

Table 3.5-2 Marine Mammals Potentially Present within the Demolition, Construction, Operations and Open-Water Dredged Disposal Site and Contractor Multi-use Site(s) Routes Region of Influence

Species and Stock	*ESA Status*	*MMPA Status[2]*	*Seasonal Timing of Occurrence*	*Frequency of Occurrence[3], in or near Sinclair Inlet*
Humpback Whale (*Megaptera novaeangliae kuzira*) Central America/ Southern Mexico – CA-OR-WA demographically independent population (DIP)	Central America DPS – Endangered[1]	Depleted and Strategic	Year round, peak in April to November	Rare
Humpback Whale (*Megaptera novaeangliae kuzira*) Mainland Mexico – CA-OR-WA DIP	Mexico DPS – Threatened[1]	Depleted and Strategic	Year round, peak in April to November	Rare
Humpback Whale (*Megaptera novaeangliae kuzira*) Mexico – North Pacific unit	Mexico DPS – Threatened[1]	Depleted and Strategic	Year round, peak in April to November	Rare
Humpback Whale (*Megaptera novaeangliae kuzira*) Hawai'i – Southeast Alaska/Northern British Columbia DIP	Hawai'i DPS - None	None	Year round, peak in April to November	Rare
Killer Whale (*Orcinus orca rectipinnus*) West Coast Transient	None	None	Year round, peaks in spring and fall	Rare
Killer Whale (*Orcinus ater*) Eastern North Pacific Southern Resident	Southern Resident DPS-Endangered[1]	Depleted and Strategic	Year round, peaks in fall and winter months	Rare
North Pacific Minke Whale (*Balaenoptera acutorostrata scammoni*) California–Oregon–Washington	None	None	Year round, more likely March to November	Rare
Gray Whale (*Eschrichtius robustus*) Eastern North Pacific	Delisted	None	Year round, peak in March to June	Rare
Pacific Harbor Porpoise (*Phocoena phocoena vomerina*) Washington Inland Waters	None	None	Year round	Likely
Dall's Porpoise (*Phocoenoides dalli dalli*) California–Oregon–Washington	None	None	Year round, peak in winter	Rare (Rarely seen within Puget Sound)
Steller Sea Lion (*Eumetopias jubatus*) Eastern	Eastern United States DPS - Delisted	None	Year round, peak in fall and winter	Rare
California Sea Lion (*Zalophus californianus*) United States	None	None	August to May, peak in September to January	Likely, haulout located on-site (PSB floats)
Northern Elephant Seal (*Mirounga angustirostris*) California Breeding	None	None	Year round, peak in spring and summer	Rare

Species and Stock	*ESA Status*	*MMPA Status[2]*	*Seasonal Timing of Occurrence*	*Frequency of Occurrence[3], in or near Sinclair Inlet*
Pacific Harbor Seal (*Phoca vitulina richardii*) Washington Northern Inland Waters	None	None	Year round	Likely, haulout located 0.7 mile (1.13 km) south of NAVBASE Kitsap-Bremerton at Port Orchard
Pacific Harbor Seal (*Phoca vitulina richardii*) Southern Puget Sound	None	None	Year round	Likely to forage along the Contractor Multi-use Site(s) Transit Route near Tacoma, haulouts located outside of the ROI.

Notes: [1]Species is also listed as State Endangered by Washington State.

[2]Depleted stocks are those that are considered to be below their optimum sustainable population or are listed under the ESA. A strategic stock is defined as one of the following: a stock for which the level of direct human-caused mortality exceeds the potential biological removal level; a stock which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; or a stock which is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA. For details, see Appendix I.

[3]Frequency of Occurrence: Rare = Few and highly intermittent confirmed sightings, or no confirmed sightings but the distribution of the species is near enough to the area that species could reasonably occur there. Likely = Confirmed and regular use of the area by the species.

Legend: DIP = demographically independent population, DPS = Distinct Population Segment; ESA = Endangered Species Act; MMPA = Marine Mammal Protection Act; PSB = port security barrier; NAVBASE = Naval Base; km = kilometer; ROI = Region of Influence

Sources: Navy 2018; Carretta et al. 2024u; Pearson et al. 2024.

ESA-listed Marine Mammals

Two ESA-listed marine mammals may occur in the Demolition, Construction, Operations and Open-Water Dredged Disposal Site and Contractor Multi-Use Site(s) Routes portions of the ROI: the humpback whale (*Megaptera novaeangliae kuzira*; Central America DPS and Mexico DPS) and the Southern Resident killer whale (*Orcinus ater*) (Table 3.5-2). Of these, only critical habitat for the Southern Resident killer whale is present in the Demolition, Construction, Operations and Open-Water Dredged Disposal Site and Contractor Multi-Use Site(s) Routes portions of the ROI, as depicted in Figure 3.5-3. Details regarding the occurrence for ESA-listed marine mammals in the Demolition, Construction, Operations and Open-Water Dredged Disposal Site and Contractor Multi-Use Site(s) Routes portions of the ROI is provided in Tables 3.5-2; detailed information on species status, distribution, and life history is also provided in Appendix I.

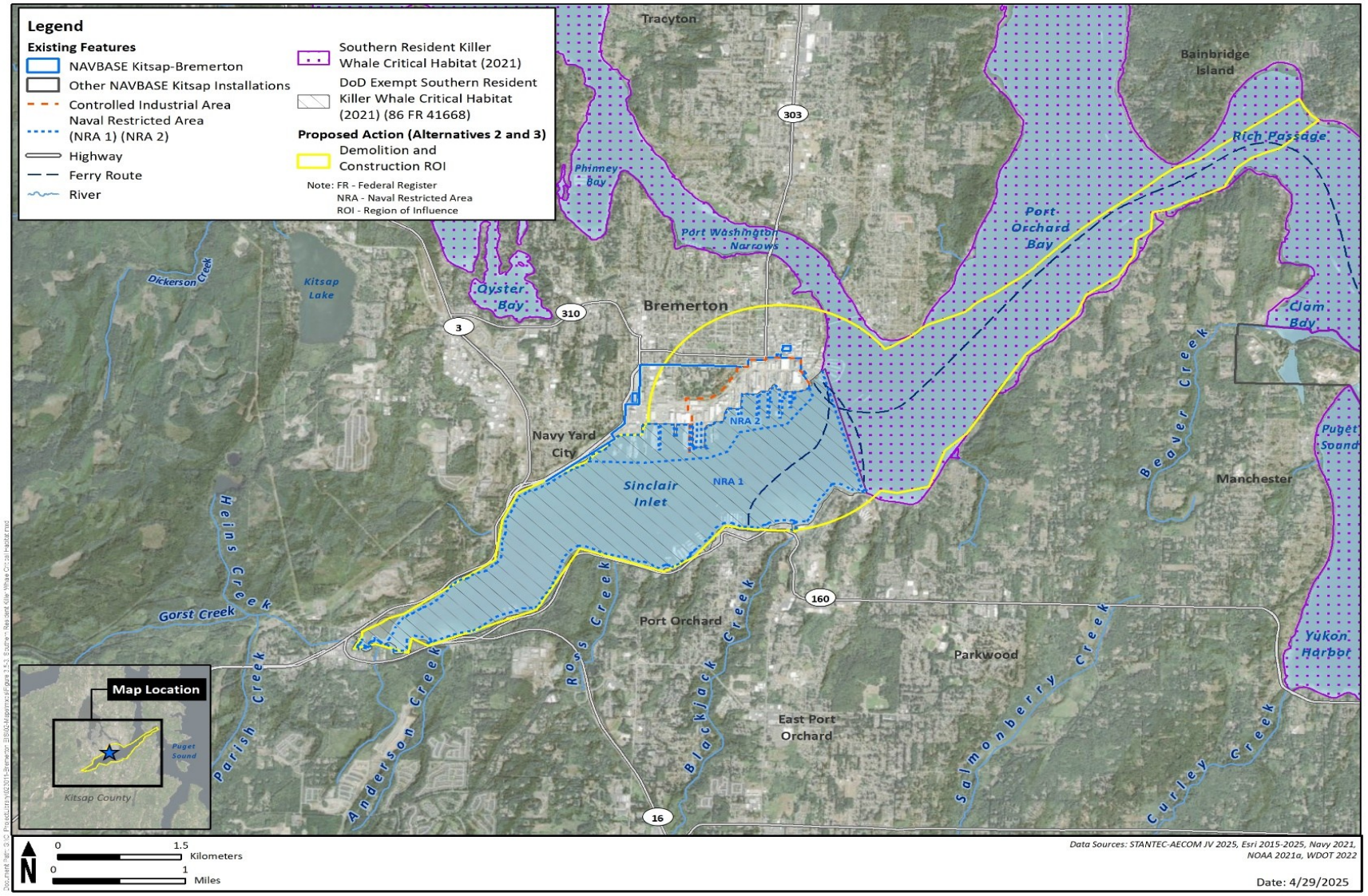

Figure 3.5-3 Southern Resident Killer Whale Designated Critical Habitat

Table 3.5-3 Marine Mammal Occurrence in the Demolition, Construction, Operations and Open-Water Dredged Disposal Site and Contractor Multi-Use Site(s) Routes Region of Influence

Species and Stocks (ESA Status)	*Site-specific Occurrence Information*
Humpback whale (1) Mexico DPS (ESA Threatened) (2) Central America DPS (ESA Endangered) (3) Hawai'i DPS (not ESA-listed)	Humpback whale sightings in Washington inland waters regularly occur in south Puget Sound, the main basin of central Puget Sound, and Colvos Passage, but to date there have been few detections in waterways in the vicinity of NAVBASE Kitsap-Bremerton. Based on a recent review of the presence of different DPSs, 69 percent of the humpback whales in Washington waters are members of the Hawai'i DPS (which is not listed under the ESA), 25 percent are from the Mexico DPS, and the remaining 6 percent are from the Central America DPS (NMFS 2021b). Humpback whales were sighted in the vicinity of Manette Bridge in Bremerton in March and May 2016, and a carcass was found under a pier at NAVBASE Kitsap-Bremerton in June 2016 which was reported to NMFS and the Marine Mammal Stranding Network. A humpback whale was sighted off the ferry pier in Bremerton on May 7, 2021. The number of humpback whales in the ROI is expected to be very low throughout the year, but sightings have occurred outside of the work window for pile driving (Sinclair Inlet in-water work window July 16 to February 15) at NAVBASE Kitsap-Bremerton. Effective May 21, 2021, NMFS designated critical habitat for the endangered Central America DPS and the threatened Mexico DPS of humpback whales along the coasts of California, Oregon, Washington and Alaska, but this critical habitat designation does not extend into Puget Sound (86 FR 21082).
Killer whale West Coast Transient (not ESA-listed)	Killer whales belonging to the West Coast Transient stock are protected under the MMPA, but not listed under the ESA. Transients have been observed in inland waters in all months (Orca Network 2025), however a study conducted 2004–2010 found that transient killer whales occurred in Washington inland waters most frequently in August–September with a strong second peak occurrence in April–May (Houghton et al. 2015). However, not all transient groups were seasonal in these studies, and their movements appeared to be unpredictable. Transient killer whales have been seen infrequently near NAVBASE Kitsap-Bremerton (e.g., sightings in May 2010, April and June 2013, June 2015, June 2023, April 2024, May 2024, February 2025 and April 2025 in Dyes Inlet; and June 2015, June 2019, April 2020, May 2022, August 2022, March 2023, October 2023, April 2024, May 2024, November 2024, February 2025, March 2025, and April 2025 in Sinclair Inlet; and April 2021 near Manette Bridge) (Orca Network 2025).

Species and Stocks (ESA Status)	*Site-specific Occurrence Information*
Killer whale Southern Resident DPS (ESA Endangered)	Southern Resident killer whale presence is unlikely in the Demolition, Construction, and Operations ROI and around NAVBASE Kitsap-Bremerton. The last confirmed sighting of Southern Resident killer whales near the Demolition, Construction, Operations ROI occurred in January 2015 when individuals were briefly in Sinclair Inlet just east of NAVBASE Kitsap-Bremerton. The last sighting prior to that was in Dyes Inlet in 1997, just east of the NAVBASE Kitsap-Bremerton waterfront (The Whale Museum, 2023). Southern Resident killer whales are more frequently sighted in the portions of Puget Sound located along the Open-Water Dredged Disposal Site and Contractor Multi-Use Site(s) Routes ROI (Orca Network 2025). In 2006, NMFS designated approximately 2,560 square miles (6,630 square kilometers) of critical habitat in three specific marine areas (71 FR 69054). Eighteen sites owned or controlled by the DoD are excluded from this critical habitat designation, including Navy installations within Puget Sound. However, designated critical habitat for the Southern Resident killer whales does occur in the ROI beyond the boundaries of DoD-controlled areas (71 FR 69054).
Minke whale California–Oregon–Washington (not ESA-listed)	No sightings were reported in the vicinity of the Demolition, Construction, Operations ROI (Rich Passage through Agate Passage including Sinclair Inlet and Dyes Inlet). This species is occasionally sighted in the portions of Puget Sound located along the along the Open-Water Dredged Disposal Site and Contractor Multi-Use Site(s) Routes ROI (Orca Network 2025).
Gray whale Eastern North Pacific (not ESA-listed)	Gray whales are most likely to occur from March through November, potentially when in-water construction work would occur. Fewer than 20 gray whales are documented in the inland waters of Washington and British Columbia each year. Most whales sighted are part of a small, regularly occurring group of 15-20 gray whales (referred to by researchers as “Sounders”) that use mudflats in the Whidbey Island and Camano Island areas as a spring and summer feeding area (Pavlinovic and Calambokidis, 2024). Observed feeding areas are located in Saratoga Passage between Whidbey and Camano Islands, including Crescent Harbor, and in Port Susan Bay between Camano Island and the mainland north of Everett; however, gray whales occasionally occur within the central and south Puget Sound. A gray whale carcass was found under a quay wall at NAVBASE Kitsap-Bremerton March 26, 2021 which was reported to NMFS and the Marine Mammal Stranding Network. A necropsy showed that the gray whale was emaciated and was likely part of the Unusual Mortality Event declared by NMFS in 2019 and closed on March 14, 2024.
Harbor porpoise Washington Inland Waters (not ESA-listed)	In Washington inland waters, harbor porpoises are known to occur year-round. Since 1999, PSAMP data, stranding data, and aerial surveys conducted from 2013 to 2015 documented increasing numbers of harbor porpoises in Puget Sound (Jeffries 2013; Jefferson et al. 2016). Little information is available on harbor porpoise occurrence for NAVBASE Kitsap-Bremerton but based on the regional density estimate of 0.54 individuals per square kilometer (Navy 2019), this species is expected to regularly occur in the vicinity of NAVBASE Kitsap-Bremerton in low numbers.

Species and Stocks (ESA Status)	*Site-specific Occurrence Information*
Dall's porpoise California–Oregon–Washington (not ESA-listed)	Dall's porpoises were previously detected in Puget Sound during aerial surveys in winter (1993–2008) and summer (1992–1999) as part of the PSAMP, with additional observations reported to Orca Network (2025). During the surveys, Dall's porpoises were sighted in Puget Sound as far south as Carr Inlet in southern Puget Sound and as far north as Saratoga Passage. Dall's porpoises have not been documented in the Rich Passage to Agate Passage area in the vicinity of NAVBASE Kitsap-Bremerton in either summer or winter surveys. Extensive aerial surveys of Puget Sound and Hood Canal during 2013–2015 detected only one individual but did not specify its location (Jefferson et al. 2016). Dall's porpoises could be present in waters in the ROI, but are unlikely to occur with regularity, and if present are likely to occur in small group sizes.
Steller sea lion Eastern United States/DPS (ESA delisted)	Shore-based surveys at NAVBASE Kitsap-Bremerton have only detected Steller sea lion once since the surveys were initiated in 2010, with one individual observed hauled-out on the PSB in September of 2022 (Navy 2022a). However, there have been other detections of the species at NAVBASE Kitsap-Bremerton. During marine mammal monitoring P-834 Seawolf Class Service Pier Extension, there were 87 observations of Steller sea lion transiting through the monitoring area during 95 days of monitoring, occurring in July to January (Navy, 2021a). Naval Base Kitsap, Bangor, Washington Marine mammal monitoring during the 2023 test pile program at Bremerton detected one Steller sea lion during 15 days of monitoring (Navy, 2024). Steller sea lions were detected on navigational buoys during aerial surveys of Puget Sound conducted by WDFW in spring 2013 (Jeffries 2013). Steller sea lions haul-out on floating platforms in Clam Bay, approximately 0.5 mile (0.8 kilometers) offshore from the NAVBASE Kitsap-Manchester finger pier, approximately 8 miles (13 kilometers) from NAVBASE Kitsap-Bremerton.
California sea lion United States (not ESA-listed)	California sea lions are typically present in Washington inland waters most of the year, except for mid-June through mid-August, with peak between October and April. California sea lions would be expected to forage opportunistically within the ROI, following local prey availability, but regularly move to the Strait of Juan de Fuca and the Pacific coast to forage (DeLong et al. 2017). During the summer months and associated breeding periods, the species is generally absent as they would be returning to rookeries in California waters. California sea lions have been documented during shore- and boat-based surveys at NAVBASE Kitsap-Bremerton since 2010. Summary reports for these surveys through October 2022 indicate that as many as 412 individuals may be hauled-out at one time (October 2019) on the PSB floats (see Figure 3.5-4). Overall, the number of sea lions observed has been relatively stable since 2016, although there has been variability in survey efforts from year to year (41 surveys in 2022 compared to approximately 12 surveys per year preceding 2019). The average monthly mean count of California sea lions hauled-out on the PSB during the in-water work window of July 16 to February 15 is 116 animals for the most recent 10 years of survey data (July 2012 to October 2022) (Navy 2023b).

Species and Stocks (ESA Status)	*Site-specific Occurrence Information*
Northern elephant seal California Breeding (not ESA-listed)	In Washington inland waters, there are regular small haulout sites at Smith and Minor Islands, Dungeness Spit, and Protection Island in the Strait of Juan de Fuca that are thought to be used year round. Additionally, a few individuals have been regularly using and even pupping on Whidbey Island and Anacortes (Cauvel 2020). Within the vicinity of NAVBASE Kitsap-Bremerton, individual elephant seals are occasionally observed hauled-out on the shoreline while undergoing their annual molt, which occurs over 4 weeks on average during the spring and summer (Worthy et al. 1992). Shore-based surveys at NAVBASE Kitsap-Bremerton have not detected any elephant seals since the surveys began in 2010 (Navy 2022a); however, one individual was seen in August of 2020 near Kitsap Memorial Park (Navy, 2021a) and one individual was seen at South Beach on Bainbridge Island in May of 2023, just outside of the Demolition, Construction, and Operations ROI (Navy, 2023b).
Harbor seal (1) Washington Northern Inland Waters (not ESA-listed) (2) Southern Puget Sound (not ESA-listed)	Harbor Seals that haul-out north of the Tacoma Narrows Bridge (includes Sinclair Inet) are considered to be part of the Washington Northern Inland Waters Stock. No haulouts have been identified at NAVBASE Kitsap-Bremerton, and the nearest documented haulout is across Sinclair Inlet, approximately 0.7 mile (1.1 kilometer) away (see Figure 3.5-4). Shore-based surveys at NAVBASE Kitsap-Bremerton have occasionally observed harbor seals hauling-out on the PSB or submarines since the surveys began in 2010 (Navy 2022). During these surveys, small numbers of harbor seals have also often been observed swimming near the Bremerton waterfront during various months. Approximately 0.24 harbor seals were observed per monitoring day, when monitors were present for a few hours (Navy 2022). Dead harbor seals are also occasionally located during these surveys or reported by shipyard personnel, with causes of death, if evident, including net entanglement, prematurely born pups, gunshot wounds, and predation wounds. In 2022, nine harbor seal carcasses were recorded at NAVBASE Kitsap-Bremerton (Navy 2023b). Many of the carcasses were too decomposed to determine cause of death. Harbor seals that haul-out south of the Tacoma Narrows Bridge are considered to be part of the Southern Puget Sound Stock. This stock would not be exposed to demolition, construction, or operations but may encounter transiting barges along the Contractor Multi-Use Site(s) transit route in the vicinity of Tacoma.

Legend: DoD = Department of Defense; ESA= Endangered Species Act; DPS = Distinct Population Segment; FR = Federal Register; MMPA = Marine Mammal Protection Act; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; NMFS = National Marine Fisheries Service; PSAMP = Puget Sound Ambient Monitoring Program; PSB = Port Security Barrier; ROI = Region of Influence; WDFW = Washington Department of Fish and Wildlife

Sources: Baird and Dill 1995; Calambokidis and Baird 1994; Calambokidis et al. 2010; Carretta et al. 2012; Cascadia Research 2016; DeLong et al. 2017; Evenson et al. 2016; Hall 2004, 2011; Houghton et al. 2015; Jefferson et al. 2016; Jeffries 2013; Jeffries et al. 2000; Morton 1990; Navy 2016a, 2021a, 2022, 2023b; NMFS 1997; Nysewander et al. 2005; Orca Network 2025, 2022; Osmek et al. 1996; Thorson, NAVFAC Northwest, personal comm., March 10, 2021; WDFW 2008, 2015

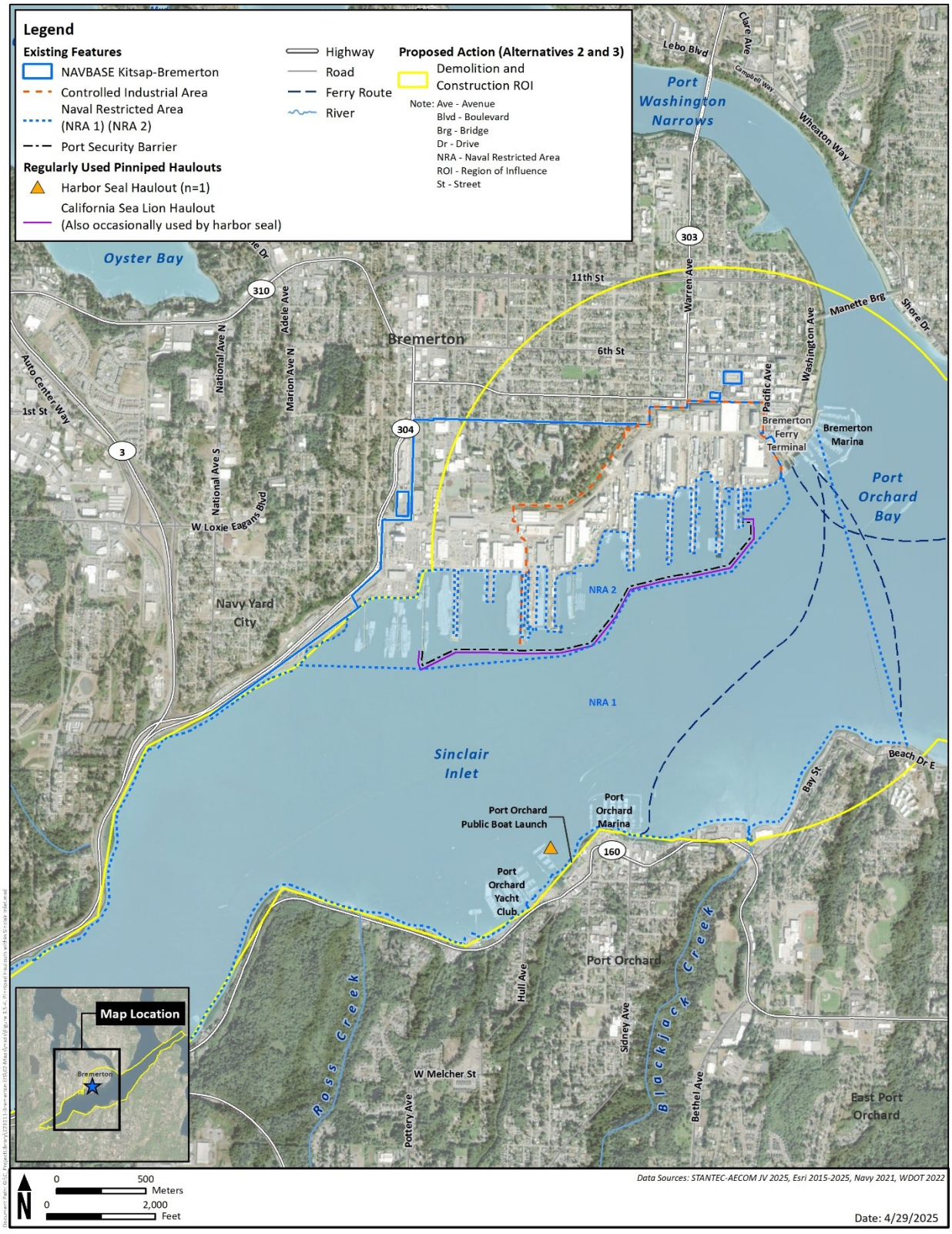

Figure 3.5-4 Pinniped Haulouts within Sinclair Inlet

Birds

All marine bird species are protected under the MBTA, many species of which are expected to occur within the Demolition, Construction, Operations; Open-Water Dredged Disposal Site and Contractor Multi-Use Site(s) Routes; and Caisson Delivery Transit Route portions of the ROI. These, as well as terrestrial bird species potentially encountered at NAVBASE Kitsap-Bremerton, are shown in Table 3.5-4 for the ROI (Navy 2018). Major groupings of birds that occur along the NAVBASE Kitsap-Bremerton waterfront area include shorebirds, wading birds, marine waterfowl, raptors, and seabirds (Table 3.5-4) (see Appendix I for a summary of each grouping). In Puget Sound, bird abundance and diversity are typically highest in the winter and large numbers of marine waterfowl are present during this time. Seasonal fluctuations reflect the migratory nature of most bird species occurring in Puget Sound and potentially present in the ROI. Some birds use human-made structures on waterfronts and trees along the shoreline for perching, resting, and nesting. In general, the focus of this section is on marine bird use of marine and shoreline habitats and associated food resources within the ROI. This would include estuarine habitat, shorelines, intertidal and subtidal zones of nearshore waters, and marine deep water habitat as the Proposed Action involves in-water and over-water work along the NAVBASE Kitsap-Bremerton waterfront. The marbled murrelet (*Brachyramphus marmoratus*) is the only ESA-listed and Washington state-listed bird species that may be present within the Demolition, Construction, Operations portion of the ROI. Although other ESA-listed birds may be encountered along the Open-Water Dredged Disposal and Contractor Multi-use Site(s) Routes and/or Caisson Delivery Transit Route portions of the ROI, impacts are not anticipated to ESA-listed birds along those portions of the ROI and are not discussed further. A summary of the marbled murrelet regulatory status and presence within the Demolition and Construction portion of the ROI is provided below. More detailed life history information is provided in Appendix I.

Bald eagles are protected under the Bald and Golden Eagle Protection Act as well as the MBTA. A bald eagle nest is located north of Pier B in a residential area outside the shipyard, approximately 2,500 feet (762 meters) from the waterfront (Navy 2018). See Appendix I for life history information on bald eagles.

Ospreys are also known to nest (or attempt to nest) on inactive vessels at NAVBASE Kitsap-Bremerton (Navy 2018). Plans exist to construct multiple alternate nesting platforms to encourage the birds to nest away from Navy vessels, but are currently on hold.

ESA-listed Birds

The only ESA-listed bird that occurs at NAVBASE Kitsap-Bremerton is the marbled murrelet. The Washington, Oregon, and California DPS of the marbled murrelet was federally listed as threatened in 1992 by the USFWS (57 Federal Register [FR] 45328). This species is also listed as endangered in the state of Washington. Critical habitat for nesting was designated for the marbled murrelet in 1996 (61 FR 26256) and revised in 2011 (76 FR 61599). No designated critical habitat occurs within the Demolition, Construction, Operations portion of the ROI.

Table 3.5-4 Bird Groupings and Families of Puget Sound

Bird Grouping	*Bird Families*	*Season(s) of Occurrence*	*Preferred Habitats*	*Preferred Prey*
Shorebirds	Plovers, dowitchers, sandpipers, yellowlegs, and phalaropes	Killdeer: year round Spotted sandpiper: summer Phalaropes: during migration All other species: winter and during spring and/or fall migration	Shorebirds: intertidal zone, mudflats, beaches	Shorebirds: marine worms, insect larvae, aquatic insects
Wading Birds	Great blue heron	Year round	Shoreline, shallow marine and freshwater	Crustaceans, small fishes
Waterfowl	Geese, dabbling ducks (wigeon, mallard), diving ducks (scaup), and sea ducks (scoters, bufflehead, goldeneye, mergansers)	Canada goose, red-breasted and common mergansers, and some dabbling ducks: year round	Canada goose, mergansers, dabbling ducks: marine and freshwater shorelines, eelgrass beds, and shallow water	Canada goose: vegetation Dabbling ducks: marine and freshwater vegetation, freshwater and marine larvae, aquatic and terrestrial insects Mergansers: small fishes
		Surf and white-winged scoters: primarily winter and in nonbreeding flocks during summer	Scoters, goldeneyes: marine nearshore and deeper water, near piles	Scoters, goldeneyes: mollusks, barnacles, crustaceans, other invertebrates, small fishes
Diving Birds	Grebes, loons	Winter and/or during migration (spring and/or fall migration)	Grebes, loons: marine nearshore and deeper water	Small fishes
Raptors	Bald eagle	Year round	Usually found near water or perched in large trees	Opportunistic diet includes fish, other birds, carrion and garbage
	Osprey	Summer	Saltwater bays and estuaries; less common around brackish or freshwater bodies	Medium-sized fish
Seabirds	Pursuit divers: alcids and cormorants	Pursuit divers: Common murre: winter; pigeon guillemot: spring and summer; marbled and ancient murrelets: winter; cormorants: winter. All other species: winter	Marine nearshore and deeper water	Small fishes, invertebrates, zooplankton
	Surface feeders: gulls and terns	Gulls: Bonaparte's gull: fall and spring migrant; short-billed gull: winter, migrant; glaucous-winged gulls: year round; Terns: Caspian terns: summer; common tern: fall migrant All other species: year round	Shoreline, marine nearshore, and deeper water	Small fishes, mollusks, crustaceans, garbage, carrion

Sources: Sibley 2003; Smith et al. 1997; Opperman and Washington Ornithological Society 2003; Larsen et al. 2004; Wahl et al. 2005; WDFW 2015; Navy 2018

At-sea marbled murrelet surveys have been conducted since 2000 in Washington State during the nesting season of May through July (McIver et al. 2021). The survey areas investigated by McIver et al. (2021) overlap the Demolition, Construction, Operations portion of the ROI but encompasses a much larger area that includes the Strait of Juan de Fuca, Puget Sound, Hood Canal, and the San Juan Islands. At-sea density surveys have also been conducted since 2012 adjacent to Navy facilities, including NAVBASE Kitsap-Bremerton (Pearson and Lance, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020; Pearson et al. 2023, 2024). These surveys occur during the nonbreeding season of September through April within the central Puget Sound (including NAVBASE Kitsap-Bremerton and Keyport as well as NAVBASE Kitsap-Manchester). Very few marbled murrelets have been reported during these surveys (Pearson and Lance, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020; Pearson et al. 2023, 2024). However, forage fish habitat occurs in Sinclair Inlet, which could attract foraging marbled murrelets.

Marine Vegetation

Marine vegetation includes plants (e.g., eelgrass) and macroalgae.

Marine vegetation observed in the NAVBASE Kitsap-Bremerton waterfront area is limited to macroalgae (Table 3.5-5). Some seagrasses occur in Sinclair Inlet and within the larger Demolition, Construction, Operations portion of the ROI (Table 3.5-5, Figure 3.5-5), although eelgrass (*Zostera marina*) is relatively sparse (Christiaen et al. 2019). Non-native eelgrass (*Zostera japonica*) has also been observed in one location near Rich Passage (Washington State Department of Natural Resources 2025a).

Table 3.5-5 Marine Vegetation in Sinclair Inlet and Adjacent Aquatic Areas

Vegetation Type	*Ecological Role*	*Location in Sinclair Inlet and Adjacent Aquatic Areas*
Eelgrass (*Zostera spp.*)	Provides food, shelter, and nursery habitat for a wide range of nearshore marine organisms. Helps prevent erosion and maintain shoreline stability. Indicator of changes to water quality.	Observed in Demolition, Construction, Operations portion of ROI Uncommon in Sinclair Inlet; closest documented location on southern shore, approximately 1 mile (2 kilometers) east of NAVBASE Kitsap-Bremerton waterfront
Surfgrass (*Phyllospadix spp.*)	Provides food, shelter, and rearing habitat for aquatic species.	Observed in Demolition, Construction, Operations portion of ROI Closest mapped location on southern shore, approximately 0.8-mile (1.3 kilometer) east of NAVBASE Kitsap-Bremerton waterfront
Kelp (Order *Laminariales*)	Provide food and refuge for a wide variety of invertebrates and fishes, especially juvenile rockfishes, and foraging habitat for marine mammals. Provide high primary productivity in nearshore waters. Important source of carbon in food webs.	Observed in Demolition and Construction ROI, no kelp beds or kelp forests present Common east of NAVBASE Kitsap-Bremerton waterfront and in Port Washington Narrows, closest mapped location approximately 0.3-mile (0.5 kilometer) east of NAVBASE Kitsap -Bremerton waterfront
Wireweed (*Sargassum muticum*)	Non-native species that provides habitat for invertebrates but reduces biodiversity by outcompeting native marine vegetation.	Observed in Demolition and Construction ROI Closest mapped location on southern shore, approximately 0.6-mile (1 kilometer) east of the NAVBASE Kitsap-Bremerton waterfront
Sea Lettuce (*Ulva spp.*)	Primary producer that forms the basis of many food webs.	Observed in Demolition and Construction ROI Common along the NAVBASE Kitsap-Bremerton waterfront, observed at depths of up to 58 feet (18

Vegetation Type	*Ecological Role*	*Location in Sinclair Inlet and Adjacent Aquatic Areas*
		meters), most common in shoreline areas with rocky substrate (riprap) or debris Common throughout Sinclair Inlet and adjacent aquatic areas
Other brown, green, and red macroalgae	Primary producers that form the basis of many food webs. May provide habitats for other marine species.	Observed in Demolition and Construction ROI Observed along the NAVBASE Kitsap-Bremerton waterfront Mapped in Sinclair Inlet and adjacent aquatic areas

Legend: spp. = species; NAVBASE = Naval Base; ROI = Region of Influence

Sources: Washington State Department of Natural Resources 2025a-c; Gelfenbaum et al. 2006; Mumford 2007; Whatcom County Marine Resources Committee 2021; Navy 2021b.

Figure 3.5-5 provides a general overview of Washington State Department of Natural Resources-mapped macroalgae and WDFW-mapped seagrasses in Sinclair Inlet (excluding NAVBASE Kitsap-Bremerton) (Washington State Department of Natural Resources 2025a). Figure 3.5-6 depicts the distribution of macroalgae in the Demolition, Construction, Operations portion of the ROI based on representative information obtained from survey transects along the waterfront (Navy 2021b). Along the NAVBASE Kitsap-Bremerton waterfront, macroalgae have been observed at water depths of up to 58 feet (18 meters) but are most common in shoreline areas with rocky substrate (riprap) or debris (Navy 2021b; Figure 3.5-6). The most prevalent marine vegetation along the NAVBASE Kitsap-Bremerton waterfront is the green macroalgae sea lettuce (*Ulva* sp.). This observation supports Washington State Department of Natural Resources (2025a) mapping that shows sea lettuce occurrence throughout Sinclair Inlet. Other green, brown, and red macroalgae species have been observed in the NAVBASE Kitsap-Bremerton waterfront area but are less common.

Marine Invertebrates

The community of organisms that live on, in, or near the seafloor is referred to as the benthos. Most of these animals lack a backbone and are called invertebrates. Typical benthic invertebrates include sea anemones, sponges, corals, sea stars, sea urchins, worms, bivalves, and crabs.

No data on distribution or abundance of invertebrates is available for NAVBASE Kitsap-Bremerton, and there have been no comprehensive surveys of invertebrates specific to the waterfront area or the Demolition, Construction, Operations portion of the ROI. However, various studies of marine biota at NAVBASE Kitsap-Bremerton have identified some marine invertebrates that may be present. Appendix J provides a partial list of invertebrate species that may occur in the nearshore environment of the NAVBASE Kitsap-Bremerton waterfront, compiled from available data sources, as well as information on their habitats. Examples of common benthic species in the waterfront area include brittle stars (*Amphiodia urtica*), snails (*Odostomia* spp.), sea anemones (*Anthopleura* spp.), shrimp (*Palaemon* spp.), nudibranchs (Nudibranchia), sponges (Porifera), sea cucumbers (*Apostichopus californicus* and *Cucumaria* spp.), sea stars (Asteroidea), and tubeworm (*Serpula vermicularis*) (Navy 2018). Common shellfish species include various clams, crabs, and mussels (Mytilidae), limpets (Lottiidae), barnacles (*Balanus* and *Semibalanus* spp.), cockle (*Clinocardium nuttallii*), and geoduck (*Panopea generosa*) (Navy 2018).

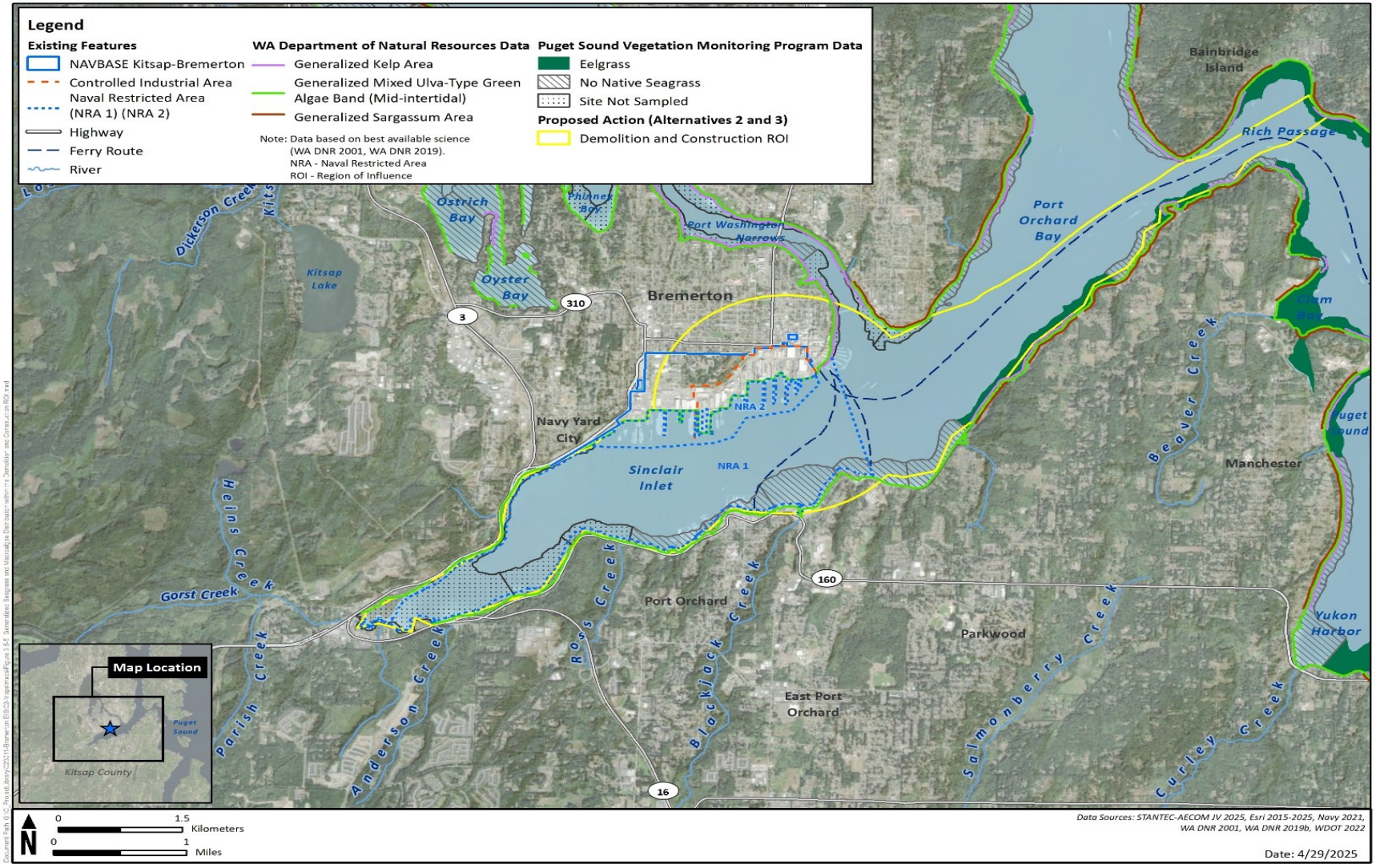

Figure 3.5-5 Generalized Seagrass and Macroalgae Distribution within the Demolition, Construction, Operations Portion of the ROI

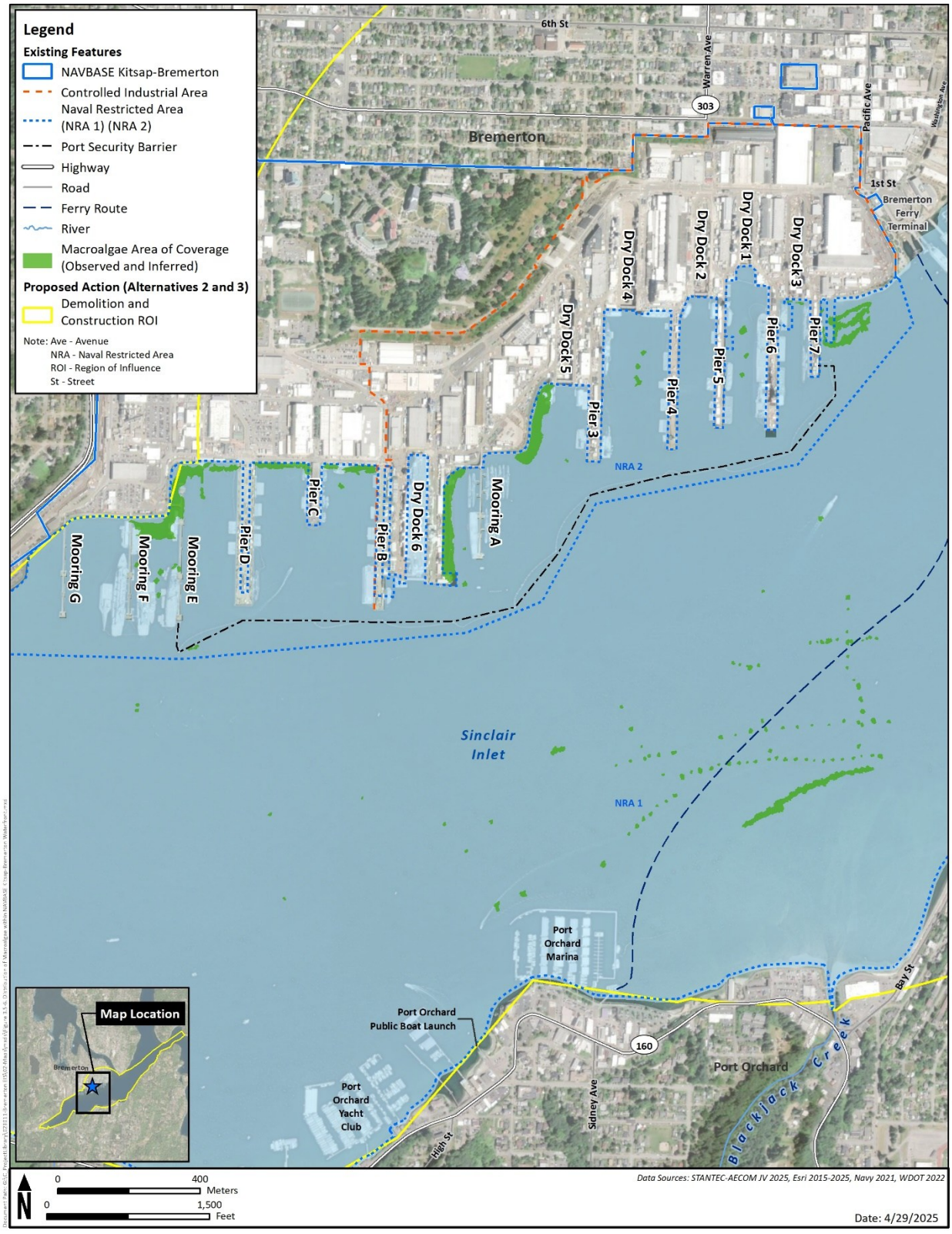

Figure 3.5-6 Distribution of Macroalgae within NAVBASE Kitsap-Bremerton Waterfront

Substrate type can be a useful predictor of invertebrate communities. The predominant substrate in Sinclair Inlet is unconsolidated mud and muddy sand, which supports invertebrate communities that are fairly typical of muddy embayments in central Puget Sound (Navy 2018). These substrates may support benthic species that live at the surface (e.g., various crabs) or in the sediment (e.g., clams). Armor rock along the shoreline of NAVBASE Kitsap-Bremerton can provide habitat for invertebrates that are found in rocks (e.g., various sea urchins and sea stars) or adhere to hard substrates (e.g., barnacles and mussels). Sessile invertebrates can also attach to other human-made structures such as pilings. Mussels are the most frequently occurring shellfish species at NAVBASE Kitsap-Bremerton and densely cover many pilings and waterfront structures (Navy 2018).

No ESA-listed invertebrates are known to occur within the Demolition, Construction, Operations portion of the ROI. However, this area is within the range of the sunflower sea star (*Pycnopodia helianthoides*), which is proposed as threatened by NMFS under the ESA (88 Federal Register 16212). Casendino et al. (2023) demonstrated that in surveys conducted from 1997–2019, that included nearby Port Madison, sunflower sea stars were most abundant at shallower depths (< 82 feet [<25 m]). Further, sunflower sea star were relatively absent from the catch after 2010. Given the extreme population decline in this area, sunflower sea stars are unlikely to be present in the Bremerton waterfront area. However, in the absence of surveys, its occurrence cannot be ruled out. Habitat for this species includes rocky and soft-bottom intertidal and subtidal habitats and can also include human-made structures which are present within the Demolition, Construction, Operations portion of the ROI. The Navy will be consulting with NMFS regarding potential effects of the project to sunflower sea star. WDFW considers some shellfish that have the potential to occur in the ROI to be priority species: native littleneck clam (*Leukoma staminea*), Pacific oyster (*Crassostrea gigas*), geoduck, Dungeness crab (*Cancer magister*), and pandalid shrimp (*Pandalus* spp.) (WDFW 2022). These species are considered vulnerable and have recreational, commercial, and/or tribal importance. Based on Washington State Department of Ecology monitoring, benthic invertebrate populations in Sinclair Inlet are being adversely affected by natural and/or human-caused stressors, with sediment quality a likely factor (Weakland et al. 2017).

No ESA-listed invertebrate species occur within the Caisson Delivery Transit Route portion of the ROI as the transit of the two vessel trips carrying a caisson from Norfolk, VA to the construction site in Washington State would be traveling along an offshore route in deeper waters than invertebrates occur and would move at slow speeds (up to 10 knots). However, in portions of the route that are less than 435 meters, there is potential to overlap waters where the sunflower sea star may occur. No ESA-listed invertebrate species are known to occur along the Open-Water Dredged Disposal Site or Contractor Multi-Use Site(s) Route portions of the ROI, although the route does overlap the range of the sunflower sea star.

Fishes

Fish are vital components of the marine ecosystem and have great ecological and economic importance. Based on surveys conducted in Sinclair Inlet (Fresh et al. 2006; Frierson et al. 2016; Lowry et al. 2013; Meador 2014; Navy 2020; Pacunski et al. 2022), ten taxonomic groups of marine and anadromous fishes may occur within the Demolition, Construction, Operations portion of the ROI (Table 3.5-6 and Appendix K). Table 3.5-7 contains the ESA-listed fish species that may occur within the Demolition, Construction, Operations portion of the ROI. A summary of EFH is defined and described in Appendix L. Completed consultation with NMFS under the MSA will be included as an appendix in the Final EIS.

Table 3.5-6 Taxonomic Groups of Fishes within the Demolition, Construction, and Operations Portion of ROI

Taxonomic Group [1]	*Description*	*Distribution within the ROI*
Batrachoidiformes (plainfin midshipmen)	Broad and flattened head, barbels and fleshy flaps on head, wide mouth	Seafloor
Clupeiformes (anchovy, herring)	Some are anadromous, while others are migratory between the ocean, bays, estuaries, and rivers	Surface, water column
Gadiformes (Pacific tomcod, pollock)	Important commercial fishery resources, associated with bottom habitats	Water column, seafloor
Gasterosteiformes (tubesnout, pipefish, sticklebacks)	Small mouth with tubular snout and armor-like scales; shows a high level of parental care	Surface
Osmeriformes (smelts)	Some are anadromous, while others are migratory between the ocean, bays, estuaries, and rivers	Surface, water column
Perciformes (perch, goby, sandlance)	Largest and most diverse group of bony fishes	Bottom habitat
Pleuronectiformes (flounders)	Occur in bottom habitats throughout the world where they are well camouflaged	Seafloor
Rajiformes (skates)	Large flat angular pectoral discs, slender tail	Seafloor
Salmoniformes – salmon, trout	Some are anadromous, while others are migratory between the ocean, bays, estuaries, and rivers	Surface, water column
Scorpaeniformes (rockfishes, sculpin)	Larval stages are pelagic; depending on species, juveniles and adults can be demersal (bottom oriented) or pelagic	Water column, seafloor

Notes: [1] Taxonomic groups are based on the following commonly accepted references: Bizzarro et al. (2022).
Legend: ROI = Region of Influence

ESA-listed Fishes and Critical Habitat

This section provides a list of ESA-listed fish species that may be present within the Demolition, Construction, Operations portion of the ROI, and critical habitat that has been designated within the ROI that may be affected by the Proposed Action (Table 3.5-7). Information on the timing of presence by lifestage for salmonids (ESA and non-ESA-listed) is presented in Table 3.5-8. More detailed life history information for each ESA-listed species is presented in Appendix I.

Five ESA-listed fish species have the potential to occur in the Demolition, Construction, Operations portion of the ROI. Four of these species fall under the jurisdiction of NMFS; Chinook salmon (*Oncorhynchus tshawytscha*) (Puget Sound ESU), steelhead (*Oncorhynchus mykiss*) (Puget Sound DPS), bocaccio rockfish (*Sebastes paucispinis*) (Puget Sound/Georgia Basin DPS), and yelloweye rockfish (*Sebastes ruberrimus*) (Puget Sound/Georgia Basin DPS). The USFWS has jurisdiction over bull trout (*Salvelinus confluentus*) (Coterminous U.S. DPS [Coastal Recovery Unit]) which is listed as threatened throughout its range.

Table 3.5-7 Presence and Status of Endangered Species Act-listed Species and their Designated Critical Habitat within the Demolition, Construction, Operations Portion of ROI

Common Name (ESU[1]/DPS[2])	*Scientific Name*	*ESA Status*	*Species Initial Ruling and Applicable Updates Final Rule (Publication Date; Effective Date)*	*Critical Habitat Designation Initial Ruling and Applicable Updates Final Rule (Publication Date; Effective Date)*	*Critical Habitat Present within the ROI (Designated/Not Designated/Exclusion)[3]*
Salmonid Species					
Chinook salmon (Puget Sound ESU)	*Oncorhynchus tshawytscha*	T	64 FR 14308 (March 24, 1999; May 24, 1999) 70 FR 37159 (June 28, 2005; August 29, 2005) 79 FR 20802 (April 14, 2014)	70 FR 52629 (September 2, 2005; January 2, 2006)	**Designated**. Exclusion from critical habitat designation within Sinclair Inlet with the exception of narrow nearshore zone from the line of extreme high tide down to the line of MLLW within NRA #1 (70 FR 52629)
Steelhead (Puget Sound DPS)	*Oncorhynchus mykiss*	T	72 FR 26722 (May 11, 2007; June 11, 2007) 79 FR 20802 (April 14, 2014)	81 FR 9251 (February 24, 2016; March 25, 2016)	**Designated outside the ROI**. Designated in freshwater only, including Gorst, Blackjack, Anderson, and Ross creeks tributary to Sinclair Inlet. Closest designated area is approximately 1.4 km (0.76 nm)
Bull trout (Coterminous United States DPS [Coastal Recovery Unit])	*Salvelinus confluentus*	T	64 FR 58910 (November 1, 1999; December 1, 1999)	70 FR 56212 (September 26, 2005; October 10, 2005) 75 FR 63897 (October 18, 2010; November 17, 2010)	**Designated outside the ROI**. Closest designated area is approximately 16 km (8.6 nm east)

Common Name (ESU[1]/DPS[2])	*Scientific Name*	*ESA Status*	*Species Initial Ruling and Applicable Updates Final Rule (Publication Date; Effective Date)*	*Critical Habitat Designation Initial Ruling and Applicable Updates Final Rule (Publication Date; Effective Date)*	*Critical Habitat Present within the ROI (Designated/Not Designated/Exclusion)[3]*
Rockfish Species					
Bocaccio rockfish (Puget Sound/Georgia Basin DPS)	*Sebastes paucispinis*	E	75 FR 22276 (April 28, 2010; July 27, 2010) 82 FR 7711 (January 23, 2017; March 24, 2017)	79 FR 68041 (November 13, 2014; February 11, 2015) correction 80 FR 7977 (February 13, 2015; February 11, 2015)	**Designated**. Not designated within the DoD exclusion area of the naval restricted areas in Sinclair Inlet (79 FR 68041)
Yelloweye rockfish (Puget Sound/Georgia Basin DPS)	*Sebastes ruberrimus*	T	75 FR 22276 (April 28, 2010; July 27, 2010) 82 FR 7711 (January 23, 2017; March 24, 2017)	79 FR 68041 (November 13, 2014; February 11, 2015) correction 80 FR 7977 (February 13, 2015; February 11, 2015)	**Designated**. Not designated within DoD exclusion area of the naval restricted areas in Sinclair Inlet (79 FR 68041)
Marine Mammals					
Humpback whale (1) Mexico DPS (2) Central America DPS	*Megaptera novaeangliae kuzira*	(1)-T (2)-E	81 FR 62305, 62259 (September 8, 2016; October 11, 2016)	86 FR 21082 (April 21, 2021; May 21, 2021)	**Not designated**. Closest designated area is within the Strait of Juan de Fuca, west of Angeles Point (approximately 90 km [56 mi] north)
Killer whale (Southern Resident DPS)	*Orcinus orca ater*	E	70 FR 69903 (November 18, 2005; February 16, 2006)	71 FR 69054 (November 29, 2006; December 29; 2006) 86 FR 41668 (August 2, 2021; September 1, 2021)	**Designated**. Exclusion from critical habitat within the DoD exclusion area of the naval restricted areas in Sinclair Inlet
Marine Invertebrates					
Sunflower sea star	*Pycnopodia helianthoides*	PT	81 FR 16212 (March 16, 2023)	--	**Not Proposed**

Common Name (ESU[1]/DPS[2])	*Scientific Name*	*ESA Status*	*Species Initial Ruling and Applicable Updates Final Rule (Publication Date; Effective Date)*	*Critical Habitat Designation Initial Ruling and Applicable Updates Final Rule (Publication Date; Effective Date)*	*Critical Habitat Present within the ROI (Designated/Not Designated/Exclusion)[3]*
Birds					
Marbled murrelet	*Brachyramphus marmoratus*	T	57 FR 45328 (October 1, 1992; September 28, 1992)	76 FR 61599 (October 5, 2011; November 4, 2011) 81 FR 51348 (August 4, 2016)	**Designated outside the ROI**. Closest designation is approximately 25 km west within the terrestrial environment.

Notes: (1) ESU is a population of organisms that is considered distinct for purposes of conservation. A species with more than one ESU can have more than one ESA listing status, as individual ESUs can be either not listed under the ESA or can be listed as an endangered, threatened, or candidate species.
(2) A species with more than one DPS can have more than one ESA listing status, as individual DPSs can be either not listed under the ESA or can be listed as an endangered, threatened, or candidate species.
(3) Although critical habitat is designated in the ROI, NAVBASE Kitsap-Bremerton is excluded based on national security impacts.

Legend: DoD = Department of Defense; DPS = Distinct Population Segment; E = Endangered; ESA = Endangered Species Act; ESU = Evolutionarily Significant Unit; FR = Federal Register; km = kilometers; mi = mile; MLLW = mean lower low water; NAVBASE = Naval Base; nm = nautical miles; NRA = Naval Restricted Area; PT = proposed threatened; ROI = Region of Influence; T = Threatened

Table 3.5-8 Salmonid Life Stages and Timing in the Demolition, Construction, Operations ROI

Species	*Life Stage*	*Present in Marine Waters of Sinclair Inlet*	*Nearest Spawning Tributaries*
Puget Sound Chinook ESU	Returning adults	Mid-June through October. Found offshore and nearshore.	Gorst and Blackjack Creeks
	Adult and subadult resident "blackmouth"	Found in both nearshore and offshore habitats throughout the year; nearshore habitats play a more important role to resident blackmouth Chinook than ocean-rearing Chinook.	
	Juvenile rearing and outmigration	Subyearling Chinook present from March to November (peak in May and June). Tend to be nearshore-oriented but have been found in both nearshore and offshore habitats in Sinclair Inlet.	
Puget Sound Steelhead DPS	Returning adults	November through April (peak from December through early January).	Gorst, Blackjack, Anderson, and Ross Creeks (winter-run)
	Juvenile outmigration	Early May through July. Not nearshore dependent. Tend to migrate rapidly to offshore waters.	

Species	*Life Stage*	*Present in Marine Waters of Sinclair Inlet*	*Nearest Spawning Tributaries*
Chinook salmon (populations not included in ESA-listing)	Returning adults	Mid-June through October (peak in August and September) for fish returning to Gorst Creek Rearing Facility. Occurring offshore and nearshore.	Gorst Creek (hatchery fall-run) and Blackjack Creek
	Juvenile rearing and outmigration	Juvenile presence includes: Gorst Creek Rearing Facility releases into Gorst Creek in two phases: (1) mid to late May; and (2) mid to late June. Documented nearshore use of Sinclair Inlet. 2) Rearing facility fish from sources outside of the critical habitat exclusion area. Generally present from July to September. Some of these fish may be present in nearshore areas of Sinclair Inlet throughout the year.	
Chum salmon	Returning adults	October to mid-November (Blackjack Creek summer run). October to mid-December (all nearby tributaries are fall-run).	Blackjack, Chico, Gorst, Anderson, Ross, Parish, Heins, Wilson, and Annapolis Creeks
	Juvenile outmigration	February through September (peak in April/May in nearshore areas and May/June in offshore areas).	
Coho salmon	Returning adults	Late August through late December.	Blackjack, Gorst, Anderson, Ross, Parish, Heins, Wilson, and Annapolis Creeks
	Juvenile outmigration	Juveniles found in low frequency in Sinclair Inlet except for March through June during outmigration period.	
Sea-run Cutthroat trout	Juveniles and adults	Adults are more present in the fall/early winter (October through January). Juveniles found nearshore April through June, particularly in or near Gorst.	Blackjack, Gorst, Anderson, Parish, Heins, Wilson, Annapolis, and Ross Creeks
Pink salmon	Returning adults	Adult pink salmon return to Puget Sound in large numbers in even years. Not known to commonly spawn in Sinclair Inlet tributaries. Strays have spawned in Gorst Creek. Any adult presence in the ROI would be limited to rare occurrences from stray fish. Puyallup River spawning occurs in September and October.	Duwamish Waterway, Puyallup River (South Prairie Creek), Carbon River, (stray pinks have spawned in Gorst Creek)
	Juvenile outmigration	April to June in even years. Subyearlings tend to move offshore in late spring. A few juvenile pink salmon were captured during 2014 trawl surveys in Sinclair Inlet near Ross Point.	
Sockeye salmon	Adults	Observations of stray sockeye salmon in Gorst Creek.	Gorst Creek

Legend: DPS = Distinct Population Segment; ESA = Endangered Species Act; ESU = Evolutionarily Significant Unit; ROI = Region of Influence

Sources: Brennan et al. 2004; City of Bremerton 2020; EPA 2000; Fresh et al. 2006; Meador 2014; NMFS 2014; NMFS 2018a; PNNL 2001; Rice et al. 2011; SalmonScape 2023; Simenstad et al. 1982; WDFW 2023a; WDF, WDW, and Western Washington Treaty Indian Tribes 1993; WDFW and Western Washington Treaty Indian Tribes 1994; Suquamish Tribe, Rod Malcom (2023) pers. comm

Critical habitat and the associated PBFs, if applicable, within the Demolition, Construction, Operations ROI are identified and described in Appendix I. Critical habitat has been designated in Sinclair Inlet along a narrow nearshore zone of NRA #1 from the line of extreme high tide down to the line of MLLW within the Demolition, Construction, Operations portion of the ROI for Chinook salmon (Puget Sound ESU) (Figure 3.5-7). Other than this narrow nearshore zone, NRAs were excluded from critical habitat designation based on national security impacts (70 FR 52629). Critical habitat has been designated outside the boundaries of DoD-controlled areas for the bocaccio rockfish and yelloweye rockfish (Puget Sound/Georgia Basin DPS) (Figure 3.5-8). Critical habitat designated for steelhead (Puget Sound DPS) is entirely freshwater; marine habitat has not been designated (Figure 3.5-9). Critical Habitat is designated for bull trout (Coterminous U.S. DPS) within the Open-Water Dredged Disposal Site and Contractor Multi-Use Site(s) Routes portion of the ROI (Figure 3.5-10 and 3.5-11).

Non ESA-listed Fishes within the Demolition, Construction, Operations Portion of the ROI

Salmonids

Non ESA-listed salmonids that occur within the Demolition, Construction, Operations portion of the ROI include hatchery fall-run Chinook salmon, naturally produced fall-run and summer-run chum salmon (*O. keta*), coho salmon (*O. kisutch*), cutthroat trout (*O. clarkii*), pink salmon (*O. gorbuscha)*, and sockeye salmon (*O. nerka*). Table 3.5-8 provides timing for various life stages of salmonids that may be present within the Demolition, Construction, Operations portion of the ROI.

Forage Fish

Forage fish in Puget Sound consist of a variety of small schooling fish, which are major food items for many species of fish, birds, and marine mammals. In addition, several species are subject to commercial and recreational fisheries (Bargmann 1998). Four species of forage fish have been documented in Sinclair Inlet: Pacific herring (*Clupea pallasii*), surf smelt (*Hypomesus pretiosus*), Pacific sand lance (*Ammodytes personatus*), and northern anchovy (*Engraulis mordax*) (Frierson et al. 2016; Pacunski et al. 2022). Other forage fish present in Puget Sound in smaller numbers are longfin smelt (*Spirinchus thaleichthys*), and other species of smelt (Osmeridae) (Penttila 2007).

Pacific herring spawning grounds are present within the Demolition, Construction, Operations ROI (Stick et al. 2014; WDFW 2023b). Pre-spawner holding grounds for herring can be found northeast in Port Orchard Bay (WDFW 2023b) (see Figure 3.5-12). The closest forage fish spawning beaches (Pacific sand lance and surf smelt) are located west and south of NAVBASE Kitsap-Bremerton. Forage fish surveys conducted in 2004, 2005, 2019, 2021 and 2022 at Charleston Beach, located on the west end of the NAVBASE Kitsap-Bremerton waterfront, confirmed surf smelt spawning activity September through May (Rudell, Paul pers. comm. 2022; WDFW 2005, 2019); additionally, there are forage fish spawning beaches across Sinclair Inlet on the City of Port Orchard's shoreline (WDFW 2023b; Figure 3.5-12). Herring spawning occurs within the Port Orchard-Madison area of South-Central Puget Sound from January through mid-April; surf smelt spawn during summer (May-August), fall-winter (September - March), or year round in Sinclair Inlet; and Pacific sand lance spawn between November and February (Penttila 2007).

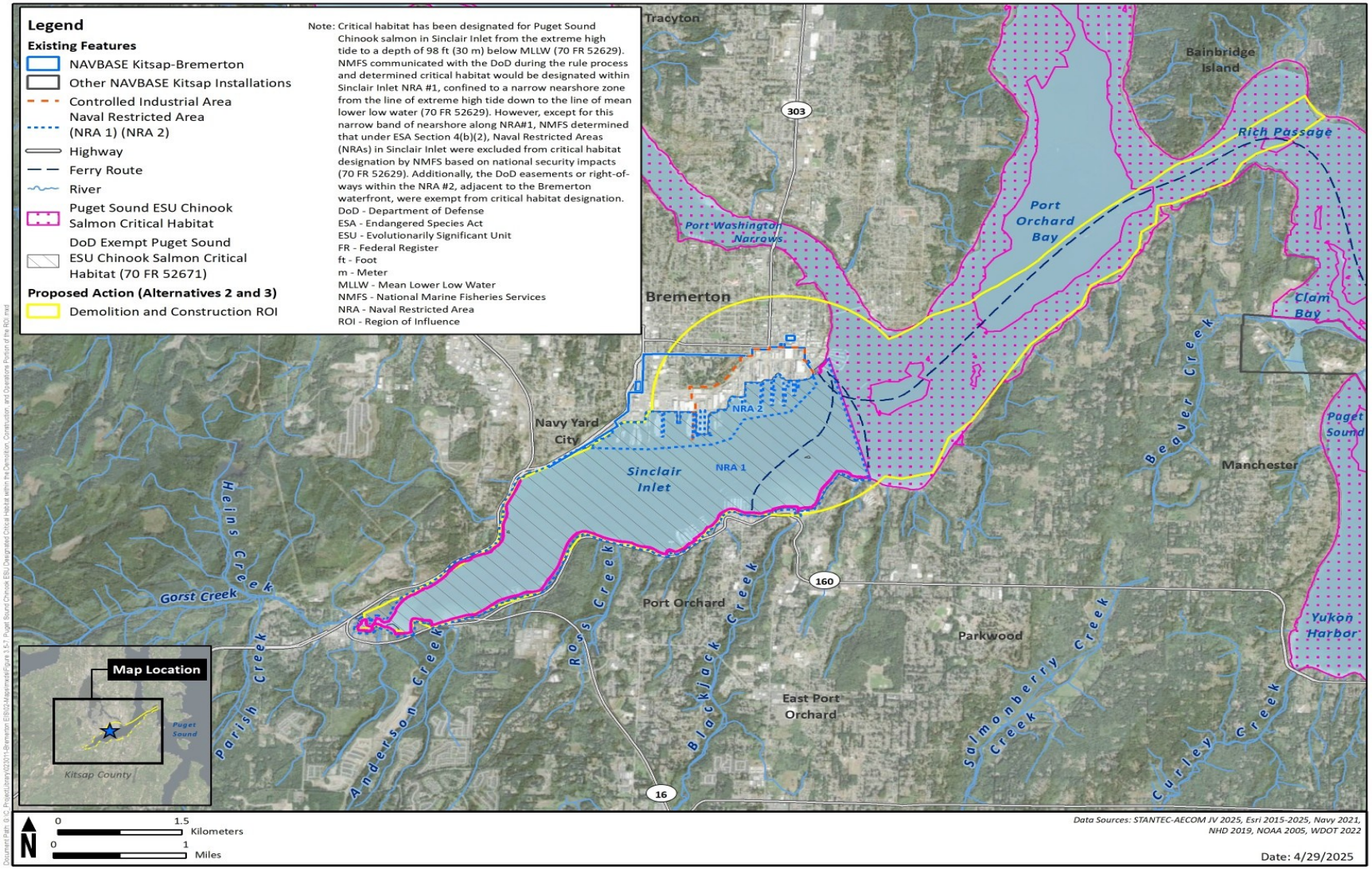

Figure 3.5-7 Puget Sound Chinook ESU Designated Critical Habitat within the Demolition, Construction, Operations Portion of the ROI

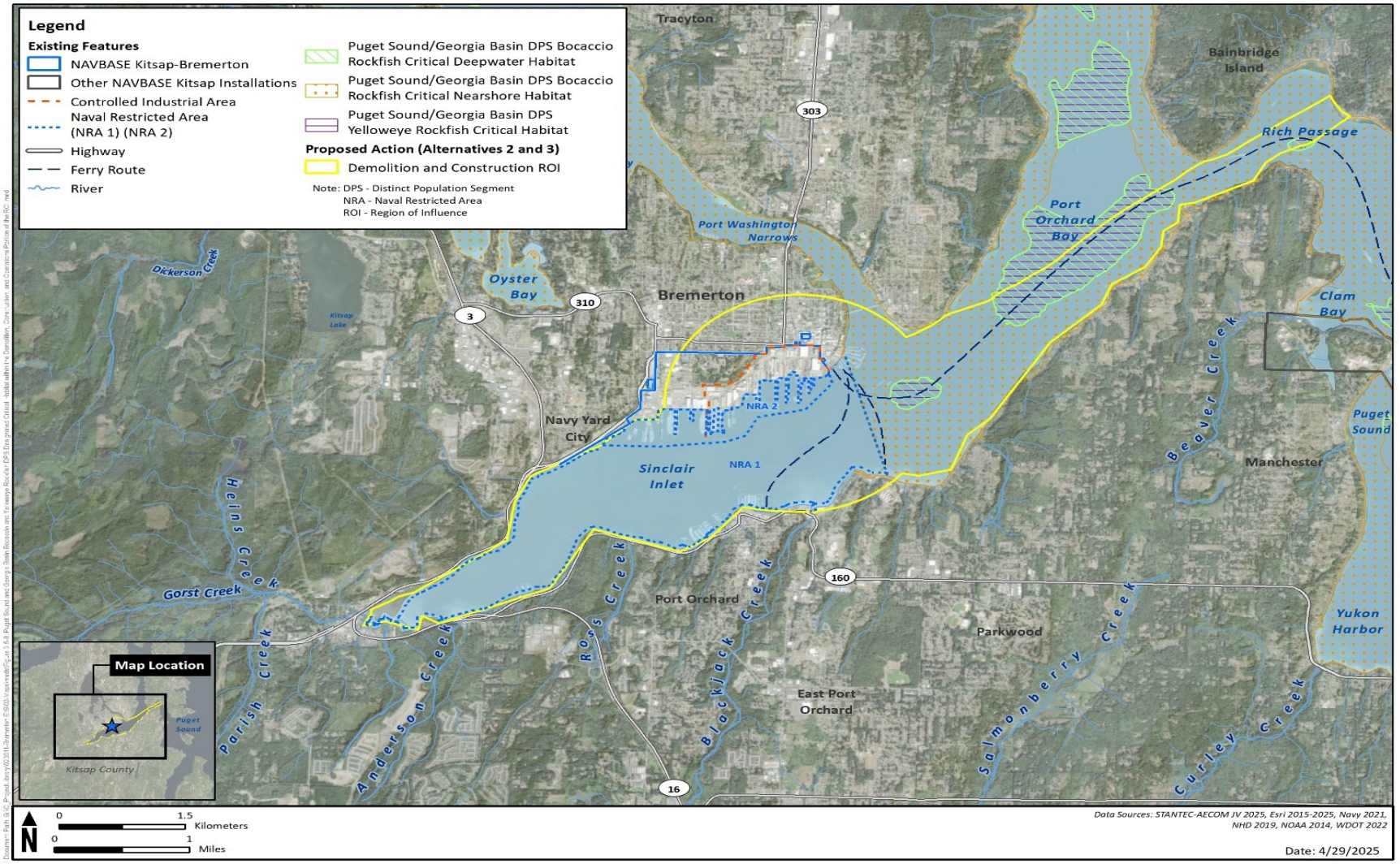

Figure 3.5-8 Puget Sound/Georgia Basin Bocaccio and Yelloweye Rockfish DPS Designated Critical Habitat within the Demolition, Construction, Operations portion of the ROI

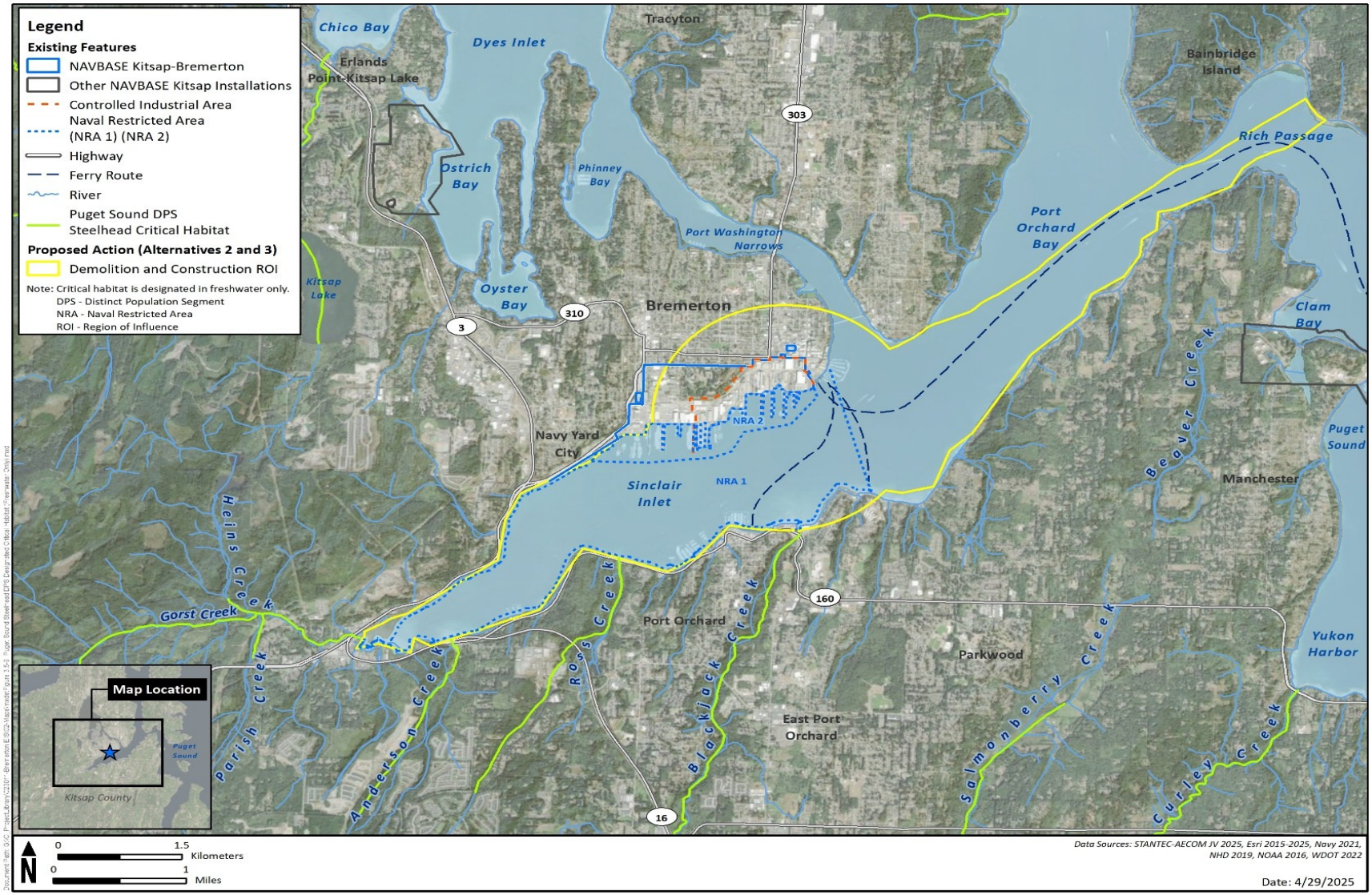

Figure 3.5-9 Puget Sound Steelhead DPS Designated Critical Habitat (Freshwater Only)

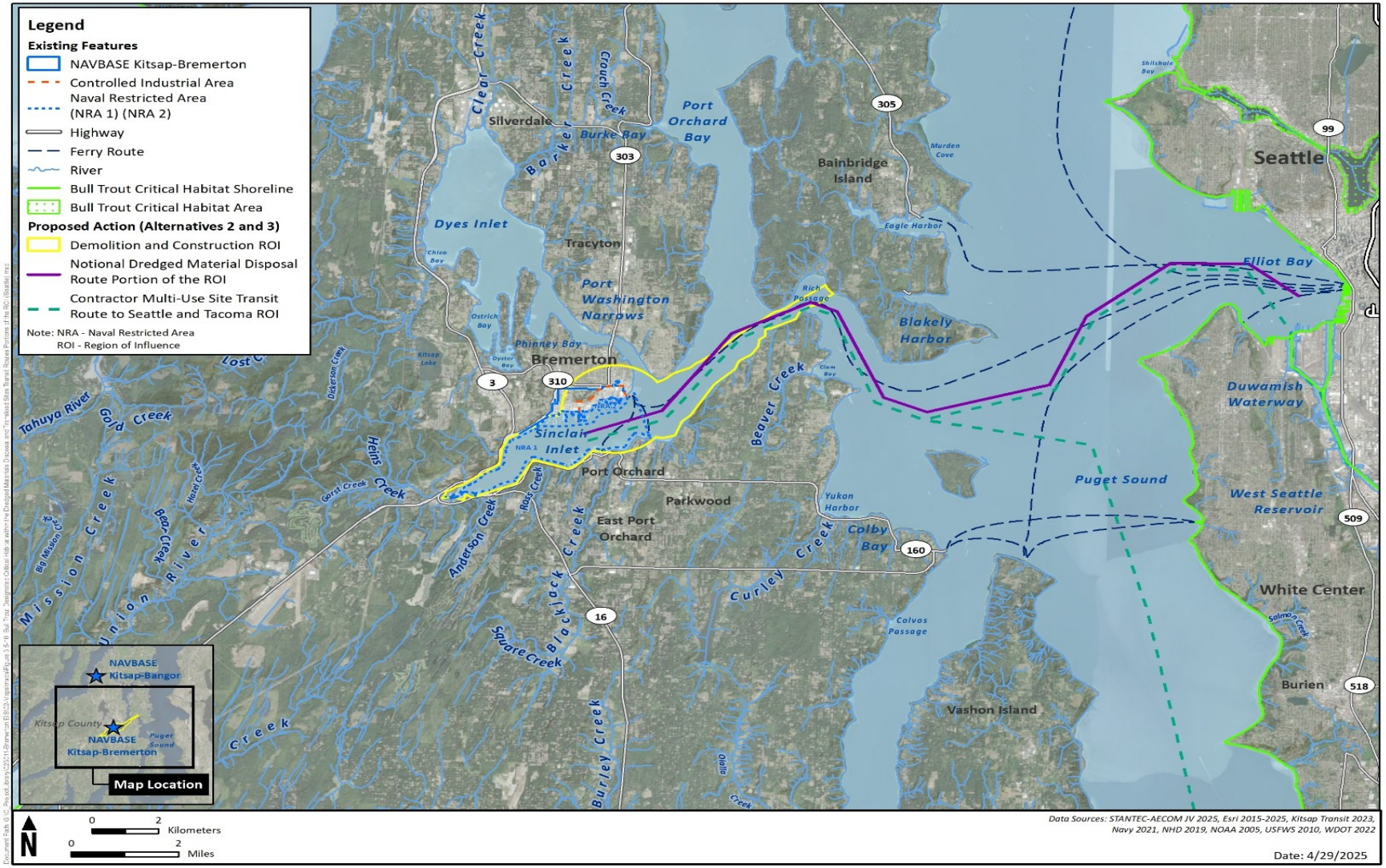

Figure 3.5-10 Bull Trout Designated Critical Habitat within Open-Water Dredged Disposal Site and Contractor Multi-Use Site(s) Routes portions of the ROI (North)

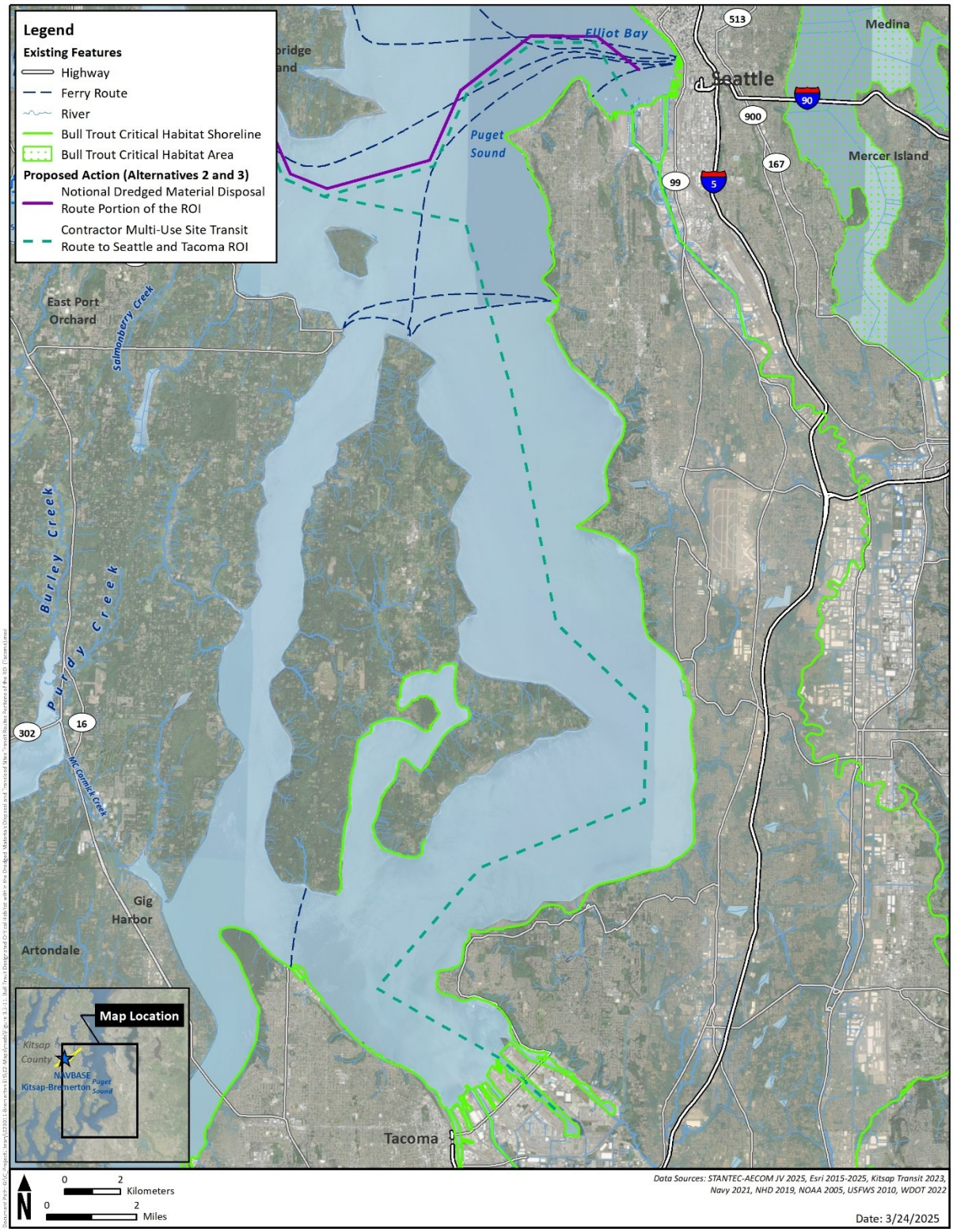

Figure 3.5-11 Bull Trout Designated Critical Habitat within Open-Water Dredged Disposal Site and Constractor Multi-Use Site(s) Routes portions of the ROI (South)

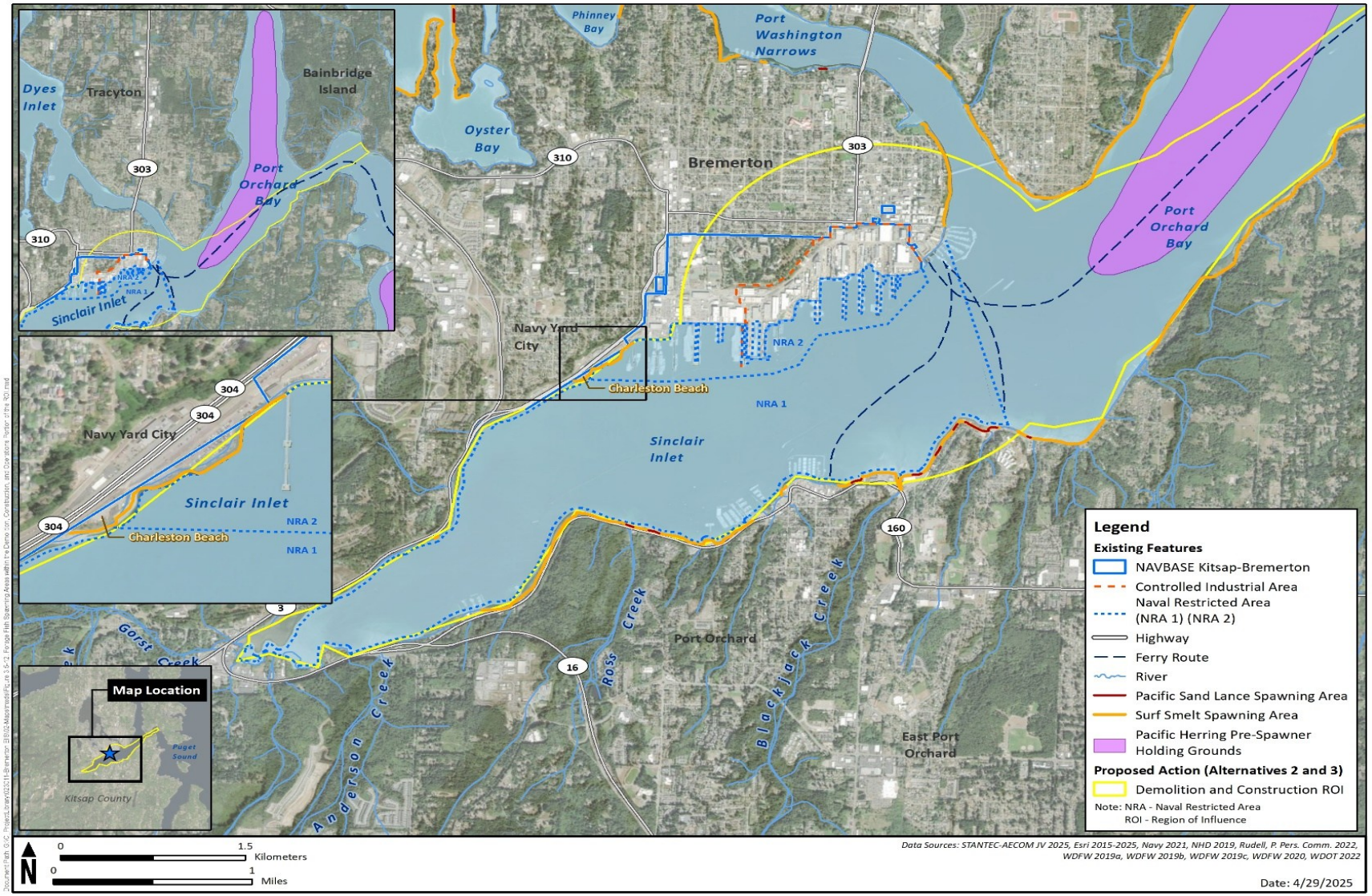

Figure 3.5-12 Forage Fish Spawning Areas within the Demolition, Construction, Operations Portion of the ROI

Other Fish Species

In addition to salmonids and forage fish, various other fish species occur within Sinclair Inlet that includes flatfishes (English sole, rock sole, starry flounder), rockfish species (brown rockfish, copper rockfish), gunnels, perch, sculpin, Northern anchovy, and market squid. Appendix K contains a list of all species that have been identified during surveys conducted between 2001 and 2022 (Fresh et al. 2006; Frierson et al. 2016; Lowry et al. 2013; Meador 2014; Navy 2020: Pacunski et al. 2022).

NAVBASE Kitsap-Bangor ROI Terrestrial Biological Resources

Vegetation

NAVBASE Kitsap-Bangor covers 6,130 acres, which includes 3,754 acres of forest, 2,093 acres of developed/disturbed lands, 54 acres of surface water, and 254 acres of wetlands (Navy 2018). Common tree species include red alder (*Alnus rubra*), Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*), western white pine (*Pinus monticola*), lodgepole pine (*Pinus contorta*), and grand fir (*Abies grandis*) (Navy 2018).

Wildlife

Terrestrial wildlife that may be present within the vicinity of the Proposed Action locations include mammals such as black bear (*Ursus americanus*), black-tailed deer (*Odocoileus hemionus*), coyote, Douglas squirrel, raccoon, Townsend's chipmunk (*Tamias townsendii*), as well as mice (*Peromyscus spp*.), voles (*Microtus spp*.), and moles (*Scapanus spp*.) (Navy 2018). Amphibians such as Pacific treefrog (*Pseudacris regilla*), northern red-legged frog (*Rana aurora*), rough-skinned newt (*Taricha granulosa*), long-toed salamander (*Ambystoma macrodactylum*), and northwestern salamander (*Ambystoma gracile*) may be present within the forested and wetland habitat of the Proposed Action locations.

Over 100 species of birds are likely to occur at NAVBASE Kitsap-Bangor. Specific species that may be present within the Proposed Action locations include dark-eyed junco (*Junco hyemalis*), black-capped chickadee (*Parus atriciapillus*), red-breasted nuthatch (*Sitta canadensis*), bushtit (*Psaltriparus minimus*), American robin (*Turdus migratorius*), Pacific wren (*Troglodytes pacificus*), American crow (*Corvus brachyrhynchos*), and mallard (*Anas platyrhynchos*). Pileated woodpecker (*Dryocopus pileatus*), northern flicker (*Colaptes auratus*), and the common raven (*Corvus corax*) may also be present within forest stands. These species are protected under the MBTA and outlined in Table 3.5-9. Other bird species that may be present and are considered nuisance species include European starlings (*Sturnus vulgaris*), rock pigeons (*Columba livia*), and Canadian geese (*Branta canadensis*). The Navy works with the U.S. Department of Agriculture, Animal & Plant Health Inspection Service to implement USFWS-approved control measures to reduce chronic problems with nesting birds and other nuisance wildlife (Navy 2018).

Table 3.5-9 MBTA-Protected Bird Species Most Likely to occur within Proposed Action locations at NAVBASE Kitsap-Bangor

Avian Group	*Members*	*Season(s) of Occurrence*	*Preferred Habitats*	*Preferred Prey*
Upland game birds (Order Galliformes)	California quail, ruffed grouse	Year round	Open grasslands to wooded areas with dense brush	Mainly herbivorous to insectivorous
Hummingbirds (O. Apodiformes)	Anna's hummingbird, Rufous hummingbird	Rufus hummingbird: Spring and Summer; Anna's hummingbird: year round	Anywhere with an abundance of flowers	Nectar and small insects
Murrelets (O. Charadriiformes)	Marbled murrelet	Summer	Uncommon on open ocean along rocky coasts; nests and roosts in old-growth forests	Small schooling fish and crustaceans
Birds of prey (multiple orders and families)	Sharp-shinned and Cooper's hawk, bald eagle, red-tailed hawk Owls (American barn owl, great horned owl, northern pygmy owl, and barred owl)	Year round	A wide variety, from grasslands and chaparral to mixed woodland, old-growth forests, and urban areas	Carnivorous: small to medium mammals, fish, and/ or other birds Small birds and mammals
Woodpeckers (O. Piciformes)	Red-breasted sapsucker, downy woodpecker, hairy woodpecker, and pileated woodpecker	Year round	A wide variety, including: grasslands, woodlands and forests, chaparral, deserts and mountains	Terrestrial arthropods, fruit, and nuts

Avian Group	*Members*	*Season(s) of Occurrence*	*Preferred Habitats*	*Preferred Prey*
Perching birds (Order Passeriformes)	Black-capped and chestnut—backed chickadee, ruby-crowned and golden-crowned kinglet, red-breasted nuthatch, brown creeper, Pacific and Bewick's wren, American robin, varied thrush, purple finch, pine siskin, dark-eyed junco, white-crowned sparrow, song sparrow, spotted towhee, orange-crowned warbler Steller's jay, American crow, common raven	Most species occur year-round, except orange-crowned warbler which primarily occurs during the breeding season	A wide variety, including: grasslands, urbanized areas, woodlands and forests	Diet generally consists of seeds, fruit, and insects Corvids: omnivorous generalists

Sources: Sibley 2003; Navy 2018; USFWS 2022

ESA-listed Birds

The only ESA-listed bird that occurs at NAVBASE Kitsap-Bangor is the marbled murrelet. There is no designated critical habitat within the NAVBASE Kitsap-Bangor portion of the ROI.

Marbled murrelets have been documented in the nearshore and deeper waters adjacent to NAVBASE Kitsap-Bangor since 2001 (Kitsap Audubon Society, 2008; Agness and Tannenbaum, 2009; Navy, 2009; Tannenbaum et al. 2009; Hart Crowser, 2013, 2014; Pearson and Lance, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020; Peterson et al. 2023, 2024). The Navy has evaluated potential nesting habitat at NAVBASE Kitsap-Bangor using criteria that define nest platforms (Harke, 2013). Marbled murrelets nest solitarily in trees with features typical of coniferous old-growth (stand age from 200 to 250 years old trees with multi-layered canopy). Although old-growth forest is the preferred habitat for nesting, this species is also known to nest in mature second-growth forest with trees as young as 180 years old (Hamer and Nelson, 1995).

In February 2023, a marbled murrelet habitat nesting assessment at NAVBASE Kitsap-Bangor was conducted. Potential nesting habitat is composed of coniferous trees within 55 miles (88.5 km) of marine waters that support at least one 4-inch diameter platform located at least 33 feet (10 meters) off the ground, with horizontal and vertical cover. There were 1,105 potential nesting platforms identified within the NAVBASE Kitsap-Bangor survey areas; 513 were described as average habitat quality and 592 as marginal (Navy 2023a). See Appendix I for additional information on marbled murrelet occurrence at NAVBASE Kitsap-Bangor.

In 2024, marbled murrelet surveys were conducted at the Bangor forge shop site. The work resulted in no definitive marbled murrelet detections, although a second year of surveys will be conducted in Spring or Summer 2025 as required by Pacific Seabird Group protocol to assign occupancy status (Raedeke 2025).

NAVBASE Kitsap-Bangor ROI Marine Biological Resources

There are no marine resources to address at NAVBASE Kitsap-Bangor as the Proposed Action would be contained within the upland terrestrial area.

3.5.2.2 Effects Associated with Reasonably Foreseeable Future Actions

RFFAs are defined in Section 3.1. The RFFAs considered for NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor are summarized in Table 3.5-10 and Table 3.5-11, respectively.

Table 3.5-10 Effects for Biological Resources from Reasonably Foreseeable Future Actions – NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy –Pier 3 Electrical Substation Repair, PSNS & IMF	Located within NAVBASE Kitsap-Bremerton Proposed ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF, and NAVBASE Kitsap-Manchester	Located within NAVBASE Kitsap-Bremerton Proposed ROI.	Construction would result in temporary resuspension of sediment (contaminated and non-contaminated) and increased underwater and airborne noise exposure to benthic habitat, invertebrates, fishes, marine birds, and marine mammals. There would be overlap with Proposed Action construction activities. This project is scheduled to be complete in 2026 for Phase I; Phase II is 2026 - 2031.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	Located outside NAVBASE Kitsap-Bremerton Proposed ROI at NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	Not applicable. No reasonably close causal relationship to biological resources identified.
Navy – SIOP, PSNS & IMF	Located within NAVBASE Kitsap-Bremerton Proposed ROI.	Could increase potential pollutant and sediment load entering Sinclair Inlet; demolition and new construction would include appropriate BMPs to manage runoff, erosion, and waste. Beneficial effects to water quality from improved stormwater treatment and sediment quality by removing large volumes of contaminated sediment from Sinclair Inlet.
Navy – OU B Marine Source Removal Actions	Located within NAVBASE Kitsap-Bremerton Proposed ROI.	Work in the aquatic environment of the NAVBASE Kitsap-Bremerton Waterfront. Source control efforts are expected to begin in 2027. Over time, this work would reduce mercury concentrations and generally improve sediment quality and water quality.
Navy - NAVBASE Kitsap-Manchester CERCLA actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	Not applicable. No reasonably close causal relationship to biological resources identified.
Navy - OU A, OU B Terrestrial, and OU NSC CERCLA actions for PFAS	Located within the NAVBASE Kitsap-Bremerton Proposed ROI	Work in the aquatic environment of the NAVBASE Kitsap-Bremerton Waterfront. Initial remedial investigations are expected to begin in 2025-2026 with additional investigations between 2029 and 2033. The necessity and magnitude of a remedial action would be based on PFAS delineation and risk evaluation. Remedial investigation and remedial action work will be dependent on access during construction activities associated with the Proposed Action.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	Located outside of NAVBASE Kitsap-Bremerton Proposed ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Located outside of NAVBASE Kitsap-Bremerton Proposed ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.
Port of Bremerton - Marina Breakwater Replacement, Port Orchard Marina	Located within NAVBASE Kitsap-Bremerton Proposed ROI	Construction would result in temporary resuspension of sediment and increased underwater and airborne noise exposure to benthic habitat, invertebrates, fishes, marine birds, and marine mammals. There would be overlap with Proposed Action construction activities. This project is scheduled to be completed in early 2029.
Private Developments at The Beacon and Beacon II and McWilliams Apartments	Located outside of NAVBASE Kitsap-Bremerton Proposed ROI	Not applicable. No reasonably close causal relationship to biological resources identified.

Legend: BMP = best management practices; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; Navy = U.S. Department of the Navy; NAVBASE = Naval Base; OU = Operable Unit; PFAS = per and polyfluoroalkyl substances; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; ROI = region of influence; SIOP = Shipyard Infrastructure Optimization Program

Table 3.5-11 Effects for Biological Resources from Reasonably Foreseeable Future Actions – NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy - Transit Protection Program Upland Support Facilities	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.
Navy - Child Development Center	Located within NAVBASE Kitsap-Bangor Proposed ROI.	Demolition and construction would occur near the proposed laydown area, clearing trees, creating airborne noise, and visual disturbance to marbled murrelet and other bird species. The project is scheduled to occur in 2024-2028.
Navy - Military Working Dog Kennel Replacement	Located within NAVBASE Kitsap-Bangor Proposed ROI.	Demolition and construction would occur near the proposed forge shop location, creating airborne noise and visual disturbance to marbled murrelet and other bird species. Project is set to begin in 2025.
Navy - Repair Substation 5	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.
Navy - Tang Road Repair	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.
Navy - Equipment Processing Building	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy - Relocate Flier Road	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.
Navy - CERCLA actions for PFAS	Located outside NAVBASE Kitsap-Bangor ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.
Navy – CERCLA Operable Unit 1 Site A	Located outside NAVBASE Kitsap-Bangor ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.
Navy – CERCLA Operable Unit 2 Site F	Located outside NAVBASE Kitsap-Bangor ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.
Navy – Alternate Power Transmission Line	Located outside NAVBASE Kitsap-Bangor ROI.	Not applicable. No reasonably close causal relationship to biological resources identified.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; ROI = Region of Influence; UXO = unexploded ordnance

3.5.3 Environmental Consequences

This section discusses the potential effects to biological resources that could result from implementation of the action alternatives and the no-action alternative. The effects analysis evaluated the potential for beneficial or adverse impacts in consideration of Best Management Practices (BMPs) and minimization measures listed in Table 3.5-12 and Table 3.5-13 (also see Appendix A). The Navy would implement BMPs and minimization measures to reduce the environmental impacts of designated activities, functions, or processes.

Table 3.5-12 Biological Resources Best Management Practices and Minimization Measures at NAVBASE Kitsap-Bremerton

BMP	*Impacts Reduced/Avoided*	*Description*	*Applicability*
BIO MGMT BREM-1	Impacts to marine species and EFH	Minimize physical contact by divers and construction-related tools, equipment, and materials with live benthic organisms, regardless of size, especially macroalgae (when present).	Construction
BIO MGMT BREM-2	Impacts to marine mammals	Construction Vessel Movement • Vessels shall operate at a speed of 10 knots or less and shall avoid marine mammals, if observed, to prevent collision. If a marine mammal comes within 10 m of such activity, operations must cease and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions, as necessary to avoid direct physical interaction. • Vessels shall be placed in neutral/idle if a protected species is within 50 feet of the vessel, until the animal is at least 150 feet away, and then shall slowly move away. • Vessel operators shall not encircle or trap marine mammals between multiple vessels or between vessels and the shore.	Construction
BIO MGMT BREM-3	Impacts to EFH (substrates, benthic communities, and macroalgae)	Shallow draft, lower horsepower tugboats would be preferentially used in nearshore areas shallower than 30 feet below MLLW, where feasible.	Construction
BIO MGMT BREM-4	Impacts to ESA-listed and non-listed salmonids	In-Water Work Window To minimize exposure of underwater noise and other in-water construction disturbance to juvenile life stages of ESA-listed salmonids, in-water work would occur during the allowable in-water work window of July 16 – February 15 (Tidal Reference Area 5; USACE 2017).	Construction
BIO MGMT BREM-5	Impacts to marine mammals, ESA-listed species, fish, and EFH	Pile Driving • Vibratory installation would be used to the extent possible when driving steel piles to minimize the potential for injury associated with higher sound pressure levels of impact pile driving. • Bubble curtains or a similarly effective attenuation system would be used to attenuate noise in the water column during impact pile driving of all steel pipe piles.	Construction
BIO MGMT BREM-6	Impacts to marine mammals, ESA-listed species, fish, and marbled murrelet	Soft-Start Pile Driving Procedure A soft-start procedure would be used for impact pile driving at the beginning of each day's in-water pile driving activity or anytime that pile driving has ceased for more than 30 minutes. The soft-start is an approach that uses a warning pulse from the pile driver so that unprotected animals in the area have a chance to leave prior to the pile driver operating at full capacity, thereby exposing fewer animals to loud underwater sounds. The contractor shall provide an initial set of strikes from the impact hammer at reduced	Construction

BMP	Impacts Reduced/Avoided	Description	Applicability
		energy, followed by a 30-second waiting period, followed by two subsequent sets of strikes.	
BIO MGMT BREM-7	Impacts to marine mammals and marbled murrelet	<u>Species Monitoring and Shutdown</u> • The following measures would be implemented during pile driving to avoid or minimize marine mammal and marbled murrelet exposure to injurious noise levels generated from impact and vibratory pile driving: ▪ A Marine Mammal Monitoring Plan and Marbled Murrelet Monitoring Plan (Plans) would be developed by the Navy and submitted to NMFS and USFWS for approval by these agencies prior to initiation of in-water work. ▪ These Plans would be updated as needed, and any revised Plans would be submitted to NMFS and USFWS with adequate time for review and finalization prior to the start of the following annual in-water work window. ▪ Implementation of these Plans would minimize the unauthorized exposure of ESA-listed species and marine mammals to potentially injurious noise levels. ▪ Certified Protected Species Observers (Protected Species Observers are trained professionals who monitor for protected species, or animals federally protected under the Endangered Species Act and/or the Marine Mammal protection Act; observers) would be placed at the best vantage point(s) practicable to monitor for marbled murrelet and marine mammals and implement shutdown/delay procedures when applicable. Separate observers would be dedicated for monitoring marbled murrelet and marine mammals during impact and vibratory pile driving. ▪ Impact and vibratory pile driving would only occur when weather conditions permit the certified observers' adequate visibility of all shutdown zones. • In accordance with the plans, monitoring would occur within pre-determined shutdown and portions of the behavioral harassment zones for purposes of avoiding injurious effects and minimizing behavioral harassment of whales (i.e., baleen whales and killer whales). Specifics of marine mammal and marbled murrelet monitoring would include: ▪ Shutdown zones would be established through coordination with NMFS during the development of the Marine Mammal Monitoring Plan. The shutdown zones would cover, at a minimum, all areas where underwater sound pressure levels are anticipated to equal or exceed the Level A (injury) threshold for cetaceans during impact and vibratory pile driving. The shutdown zones would also encompass areas where underwater noise may exceed peak noise thresholds for all marine mammal hearing groups. For large whales, shutdown zones would also include areas where underwater sound	Construction

BMP	Impacts Reduced/Avoided	Description	Applicability
		pressure levels are anticipated to equal or exceed the Level B (behavioral) threshold. ▪ Through coordination with the Orca Network, the position of reported whales in central Puget Sound would be monitored and pile installation and extraction would cease if large whales are likely to enter areas where underwater sound pressure levels may exceed Level B (harassment) thresholds. ▪ For all marine mammals, a minimum shutdown zone of 10 meters would be established for all in-water dredging and construction. ▪ Marine mammal monitoring would take place from 30 minutes prior to initiation through 30 minutes post-completion of pile driving. ▪ Marbled murrelet monitoring would take place from 30 minutes prior to initiation through 30 minutes post-completion of impact pile driving. ▪ Should a marine mammal or marbled murrelet enter the relevant shutdown zone, pile driving would be immediately halted until the marine mammal or marbled murrelet has left the area, in accordance with the procedures developed in the plans.	
BIO MGMT BREM-8	Impacts to marine species and EFH	Ensure that all concrete grout, cement, and sealant used are non-toxic and non-hazardous to aquatic organisms.	Construction
BIO MGMT BREM-9	Impacts to marine species and EFH	If feasible, conduct work in the intertidal zone during the low and/or slack tides.	Construction
BIO MGMT BREM-10	Impacts to marine species and EFH	In the event of approaching storms, equipment shall either be removed from the project site or adequately secured.	Construction
BIO MGMT BREM-11	Impacts to marine mammals	Entanglement in Anchor Lines • Anchor lines shall have appropriate tension and kept to minimum length necessary to avoid risk of entanglement. Any lines/equipment that provide a risk of entanglement must be removed when not in use. • In-water tethers and mooring lines for vessels and marker buoys shall be kept to the minimum lengths necessary and shall remain deployed only as long as needed to accomplish the required task. Lines shall be inspected regularly and kept taut. • Before any equipment or material enters the water, a responsible party will verify that no marine mammals are in the area where the equipment, anchor(s), or materials are expected to contact the substrate.	Construction and Operations
BIO MGMT BREM-12	Impacts to marine mammals	In order to avoid marine mammal harassment, workers shall not attempt to feed, touch, haze, or otherwise intentionally interact with any marine mammals. Prior to the start of work, project workers shall be briefed on this requirement as well as other relevant BMPs related to marine mammals. Any observation of such activity would be reported to PSNS & IMF Natural Resources Manager and a report would be submitted to NMFS.	Construction and Operations

BMP	Impacts Reduced/Avoided	Description	Applicability
BIO MGMT BREM-13	Impacts to marine species and EFH	Dry docks shall be cleaned and undergo regular inspection for cleanliness prior to flooding.	Operations
BIO MGMT BREM-14	Impacts to fishes, and marine mammals	The bubble screen shall be activated at all times when the caisson is removed and a vessel is not actively crossing the caisson seat (entrance structure) into/out of the dry dock. Bubble screens shall be placed across the dry dock floor near the caisson seat to deter fish and marine mammals from entering inside a flooded dry dock. Air is forced through polyvinyl chloride piping fashioned in a U-shape down the walls and across the floor of the dry dock. Small holes in the pipe placed approximately 2 inches apart create a wall of bubbles, forming a bubble screen. These would be used on the new dry dock structures to minimize entrainment/entrapment of fish and marine mammals. These procedures were described in the Terms and Conditions issued in a previous NMFS Biological Opinion for drydock operations (NMFS 2011).	Operations
BIO MGMT BREM-15	Impacts to ESA-listed salmonids	The dry docks shall be monitored for presence of salmonids during pump down for dewatering. If adult salmonids are identified the fish are collected prior to completion of pump down and returned to Sinclair Inlet. Records are kept of date, species, and numbers collected; and whether dead, alive, or injured.	Operations
BIO MGMT BREM-16	Impacts to marine species and EFH	To prevent the spread of aquatic invasive species, decontamination of vessels and marine equipment (other than equipment that undergoes chemical decontamination) shall follow the Washington State Department of Fish and Wildlife decontamination guidance (https://wdfw.wa.gov/species-habitats/invasive/prevention).	Construction and Operations
BIO MGMT BREM-17	Impacts to ESA-listed species and marine mammals during Caisson Delivery and/or Open-Water Dredged Disposal and Contractor Multi-Use Site(s) Transit Routes	<u>Reduce the potential of ship and tow line strike.</u> Navy ships operate in accordance with the navigation rules established by the U.S. Coast Guard. All ships operating on the water are required to follow the International Navigation Rules (Commandant Instruction M16672.2D). Navigation rules are formalized in the *Convention on the International Regulations for Preventing Collisions at Sea, 1972*. Applicable navigation requirements include, but are not limited to Rule 5 (Lookouts) and Rule 6 (Safe Speed): • Rule 5 requires that ships at all times maintain a proper lookout by all available means appropriate to the prevailing circumstances and conditions to be alert for collision risks. • Rule 6 requires that all ships must proceed at a safe speed at all times so that proper and effective action can be taken to avoid collision and so they can be stopped within a distance appropriate to the prevailing circumstances and conditions. • Caisson transport will follow typical shipping transit routes. Marine vessels will avoid the Olympic Coast National Marine Sanctuary Area-To-Be-Avoided by staying offshore of the ecologically sensitive Olympic Coast.	Construction

BMP	Impacts Reduced/Avoided	Description	Applicability
		• Vessels will follow recommendations developed by Washington's Quiet Sound program which includes seasonal voluntary slow down areas to protect Southern Resident killer whale. The seasonal slowdown areas include Admiralty Inlet and portions of northern Puget Sound and are in effect from October 24 to December 22 (recently extended to January 12), when Southern Residents are known to frequent the area. When safe to do so, the caisson transport ship will transit the slowdown area at or below 10 knots (to comply with bulk carrier vessel speed guidelines) to protect Southern Resident killer whale. • Any transport vessels transiting from the East Coast will adhere to vessel speed restrictions to reduce the likelihood of mortalities and serious injuries to endangered North Atlantic right whale (*Eubalaena glacialis*) from vessel collisions (50 CFR 224.105). The caisson transport ship transiting out of Virginia will travel at 10 knots or less within the Mid-Atlantic Seasonal Management Area between November 1 and April 30 and within established Dynamic Management Areas to protect North Atlantic right whale migratory routes and calving grounds. • Vessels transporting the Caisson will avoid North Atlantic right whale critical habitat that is designated along the coasts of North Carolina, South Carolina, Georgia, and Florida and will also remain in compliance with above stated ship speed regulations. Southern Resident killer whale Washington State distance Regulations: • All vessels within Washington State waters must stay 1,000 yards away from Southern Resident killer whales. • All vessels must attempt to navigate out of the path and away from Southern Resident killer whales within 1,000 yards of the vessel while adhering to a 7-knot speed limit. • If a Southern Resident killer whale approaches within 400 yards, vessels must disengage the transmission (if it is safe to do so) and wait for the animal to move away. • While not a strict rule, if vessel operators are unsure if observed killer whales are Southern Resident or transients (Bigg's), they should assume they are Southern Resident and follow the rules for Southern Residents.	
BIO MGMT BREM-18	Impacts to fishes	• Before completion of the outer wall of the cofferdam, the contractor will minimize fish entrainment within the cofferdam, to the extent practicable. Prior to closing the final wall-segment of the cofferdam (approximately 30 feet [9 m] to allow vessel entrance/exit), a purse seine or drag net will be run through the inside of the cofferdam to minimize fish entrainment, if feasible. After fish netting is complete, a bubble screen will be put in place across the remaining open segment	Construction

BMP	Impacts Reduced/Avoided	Description	Applicability
		of the cofferdam and used continuously until the final segment of cofferdam is completed. • During dewatering operations, post-completion of the cofferdam, ESA-listed fish species would be netted/captured and removed to the extent practicable.	
BIO MGMT BREM-19	Impacts to marine mammals	• Before completion of the outer wall of the cofferdam structure (i.e., before the interior of the cofferdam structure is functionally disconnected from Sinclair Inlet), a bubble curtain system shall be installed to deter and minimize, to the extent practicable, the number of marine mammals that may inadvertently enter the enclosure. • Complete enclosure of the cofferdam structure would not occur until any marine mammals within the enclosure have left.	Construction
BIO MGMT BREM-20	Impacts to aquatic organisms	Cooling water intake structure, design, operation, and maintenance will comply with the requirements of 40 CFR 125 for minimizing marine species entrainment and impingement.	Operations

Legend: CFR = Code of Federal Regulations; EFH = Essential Fish Habitat; ESA = Endangered Species Act; m = meter; MLLW = mean lower low water; NMFS = National Marine Fisheries Service; U.S. = United States; USACE = U.S. Army Corps of Engineers; USFWS = U.S. Fish and Wildlife Service

Table 3.5-13 Biological Resources Best Management Practices and Minimization Measures at NAVBASE Kitsap-Bangor

BMP	Impacts Reduced/Avoided	Description	Applicability
BIO MGMT BANGOR – 1	Impacts to marbled murrelet from visual and noise disturbance	In order to avoid potential impacts to nesting marbled murrelet, all construction would occur from September 24–March 31 to avoid potential noise exposure to nesting murrelets.	Construction

This analysis is organized by ROI and species:

- Terrestrial and marine species within the NAVBASE Kitsap-Bremerton Demolition Construction, Operations; Caisson Delivery Transit Route; and Open-Water Dredged Disposal Site and Contractor Multi-use Site(s) Route portions of the ROI
  - Marine species include marine mammals, sea turtles, birds, marine vegetation and invertebrates, and fish.
- Terrestrial species within the NAVBASE Kitsap-Bangor forge shop/Radio Hill complex expansion, Operations Portion of the ROI

A detailed discussion of water and water quality is included in Section 3.3. The methodology used to evaluate impacts is described below.

3.5.3.1 Nature and Type of Effects

The nature and type of effects to biological resources includes those that could result from changes to water quality, physical removal or alteration of habitat, change in estuarine circulation and currents, exposure to elevated noise, and vessel strikes. Some of these effects have the potential to result in behavioral changes, injury, and/or mortality to some organisms during construction as well as subsequent facility operation.

3.5.3.2 Impact Assessment Methodology

NAVBASE Kitsap-Bremerton

Information regarding the frequency at which marine mammals, birds, and fish species are expected to occur in the Demolition, Construction, Operations portion of the ROI is provided in Appendix I. Impacts to marine biota and habitat within the Demolition, Construction, Operations portion of the ROI were analyzed by examining actions at the project site as well as additional areas where project-related actions could potentially result in temporary or permanent changes to existing conditions. The analysis focused on potential impacts to marine mammals, marine birds, marine vegetation, marine invertebrates, and fishes (including marine and anadromous fish). Upland construction would increase ambient airborne sound levels within the Proposed Action location (see Appendix N) as well as create visual disturbance to species and removal of habitat. Within the Demolition, Construction, Operations portion of the ROI, turbidity of the water column would occur during in-water work (dredging, pile driving, pile extracting) causing resuspension of contaminated sediment. See Section 3.3 – Water Resources and 3.4 Geological Resources for a detailed analysis of water and sediment quality.

The Navy is conducting ESA section 7 consultations with NMFS and USFWS regarding impacts to ESA-listed species (see Table 3.5-7) and consulting with NMFS under the MSA for impacts to EFH with implementation of Alternative 2 (Preferred Alternative). The Navy is also coordinating with NMFS under the MMPA and will request an LOA for the incidental harassment of all marine mammal species occurring within the Demolition, Construction, Operations portion of the ROI during the first five years of construction and will apply for subsequent authorizations for the remaining years of construction activity (Table 3.5-2). All conservation measures and BMPs discussed during consultation for the Proposed Action as well as proposed mitigation would be considered for inclusion into the final version of this EIS.

ESA-listed species that occur along the Caisson Delivery Transit Route and Open-Water Dredged Disposal Site and Contractor Multi-use Site(s) Route portions of the ROI were evaluated based on impacts from potential vessel strike and vessel noise.

Assumptions made in the impact analysis methodology for the Demolition, Construction, Operations portion of the ROI include the following:

- All in-water work would be restricted to the allowable in-water work window of July 16 – February 15 (USACE 2017) (a maximum of 214 days in a construction year) (BIO MGMT BREM-4).
- In-water work is anticipated to be intermittent and expected to encounter occasional delays due to weather or temporary equipment maintenance.
- Pile driving/extracting activities would occur during daylight hours for 6 days per week within the in-water work window.
- Dredging would occur 24 hours per day for 6 days per week within the in-water work window and may include up to three rigs.
- Pile driving may occur during pile installation/removal at the piers and dry dock locations with up to five rigs operating concurrently (See Table 2-7).
- Specifically:
  - For M2D2 construction, there would be up to three rigs running concurrently, with up to 6,600 impact pile strikes per rig per day and/or up to 375 minutes of vibratory pile driving/extracting per rig per day; and
  - For pile installation/removal at the pier locations, there would be up to two rigs running concurrently, with up to 6,600 strikes per rig per day and/or up to 250 minutes per day of vibratory pile installation/removal per day.
  - Bubble curtains or a similar attenuation system would be used for attenuation of underwater sound during impact driving of steel pipe piles, providing at least 8 dB (decibel) of underwater sound attenuation (see Appendix N for more information).
- Cofferdam:
  - Exterior sheet pile wall or cofferdam would be placed to exclude landward portion of the site.
  - Outside of the cofferdam, in-water pile driving and dredging would only occur within the in-water work window.
- Inside sealed cofferdam, before cofferdam is dewatered:
  - In-water pile driving would only occur within the in-water work window.
  - A bubble curtain would be used during impact pile driving of steel pipe piles.
  - Dredging would occur year-round.
- Inside sealed cofferdam, after cofferdam is dewatered:
  - Pile driving would be considered upland pile driving and could occur year-round.
  - Once the area is dry, removal of soil could occur year-round.
- Marine mammal monitoring would be conducted during all in-water work as required under the MMPA (BIO MGMT BREM-7).

- Marbled murrelet monitoring would be conducted during in-water work as required per the ESA consultation with USFWS (BIO MGMT BREM-7).

Methods Regarding Airborne Noise

Airborne noise from project activities within the Demolition, Construction, Operations portion of the ROI has the potential to impact wildlife but generally does not result in injury. Marine mammals that leave the water (seals and sea lions), terrestrial mammals, and birds may be affected through disturbance as well as masking other sounds or calls. Noise would be generated from vessels, barge-mounted equipment such as generators, earth moving loaders, and other upland construction equipment. Source levels for airborne noise from impact pile driving (110 dBA at 10 meters), representing the highest intensity noise that would be generated by the project, are well below those known to cause injury to marine mammals (NMFS 2024) and birds in laboratory situations (Dooling & Popper, 2007). In addition, recent laboratory data show that birds are much more resistant to hearing loss, auditory damage, and decline in vocal quality from noise than mammals (Dooling et al. 2019). A recent study conducted by Smith et al. (2023) measured hearing thresholds in marbled murrelets and observed general sensitivity in aerial (in air) hearing. The study also found that anthropogenic sounds overlapped with marbled murrelet sound sensitivities indicating susceptibility to disturbances from a range of noise types (Smith et al. 2023). Because there is established criteria to analyze impacts to marbled murrelet from airborne noise (specifically pile driving and associated impacts to masking marbled murrelet communication) and no known criteria for analyzing impacts to terrestrial mammals, all other impacts to terrestrial mammals are anticipated to be behavioral impacts with expected avoidance.

Methods Regarding Underwater Noise from Pile Installation and Removal

Underwater noise from pile installation and removal activities within the Demolition, Construction, Operations portion of the ROI has the potential to impact marine mammals, birds, and fish by causing injury, affecting hearing capabilities, masking other sounds, or changing behavior (Richardson et al. 1995; Southall et al. 2019, 2021; Hawkins and Popper 2018; Popper et al. 2014, 2019). In-water work during construction and demolition would result in an increase in underwater noise levels. Noise would be generated from support vessels, small boat traffic, barge-mounted equipment such as generators, dredging, dredged material disposal barge transport, caisson delivery, and pile installation and extraction of existing piles. Noise levels from all construction activities except pile driving and dredging are expected to be similar to current ambient sound levels resulting from routine marine operations at the Bremerton industrial waterfront. The Navy used established underwater noise source levels from construction activities and then calculated distances from the sound source to locations where sound is modeled to attenuate (dissipate) to threshold levels established by NMFS (see Appendix N). Noise above these thresholds may result in auditory injury (AUD INJ), permanent threshold shift (PTS), temporary threshold shift (TTS), and/or behavioral changes for marine mammals, fish, and marine birds. AUD INJ includes but is not limited to a permanent reduction of hearing sensitivity (PTS) by causing injury to hearing receptors in which the ability to detect a sound is decreased. PTS and TTS result in a "permanent" and "temporary" reduction in hearing sensitivity caused by cumulative exposure to intense sound, which may require minutes or hours of exposure to occur. After the sound is stopped, hearing ability affected by TTS returns over a period of time that is dependent on many factors such as intensity and duration of sound exposure (Richardson et al. 1995).

The Navy has used the Practical Spreading Loss Model as a standard equation for estimating the propagation of pile driving sound in-water and adjacent to water, as recommended by NMFS (see

Appendix N). Calculating distances to thresholds using this standard equation is a conservative method for predicting how far sound will propagate in Puget Sound because it does not take into account the complex bathymetry and shoreline as well as the soft substrate present, which will reduce sound propagation. Therefore, sound exposure levels will not propagate as far as the standard equation estimates. Section 3.4, *Geological Resources* provides additional detail on existing bathymetry of the Demolition, Construction, Operations portion of the ROI.

Impact pile driving into land adjacent to bodies of water can also create sound pressure in adjacent aquatic habitats. All piles driven below mean higher high water (MHHW) have been classified as "in-water" piles. Additionally, many of the piles included as "in-water" piles (such as the cofferdam piles for M2D2) are in areas that are currently above water and would not be wetted until excavation occurs after pile installation. Pile driving in the dry is a minimization measure designed to reduce the amount of sound that is transmitted through the water. There is no method for calculating transmission loss through soil outside of the water, and then calculating the loss in the water. WSDOT (2023) assumes transmission loss within the soil is greater than what occurs in water or air due to the denseness of the soil, and considers pile driving in the dry is effective at minimizing the effects of sound in the water and protecting fish. The Navy also assume this in the assessment.

In the case of the Proposed Action, underwater sound sources that are likely to exceed established thresholds for marine fish, birds, and mammals are limited to pile driving (impact and vibratory) and do not include other construction activities such as dredging or vessel operations. For pile driving/extracting activities, the Navy has calculated the distances to AUD INJ and behavioral thresholds for marine mammals; injury and behavioral thresholds for marine birds (specifically marbled murrelet of which criteria has been established); and mortality, recoverable injury, and TTS for fishes (Appendix N).

Appendix N provides a technical review of the physical parameters of underwater and airborne sound, the effects of sound exposure, and the methodologies that are used to analyze the potential impacts of such sound on marine fauna. For this project, the potentially impacted wildlife species include marine fish, birds, and mammals. There is also the potential for impacts to benthic invertebrates from vibrations created during pile installation and extraction activities but sound exposure criteria available is not as advanced as it is for the other marine fauna analyzed (Roberts et al. 2016).

Underwater Noise from Vessels

Marine fish, birds, and mammals may be exposed to vessel noise when project-related vessels are operating in the Demolition and Construction, Operations, Open-Water Dredged Material Disposal Site and Contractor Multi-Use Site(s) Routes, and Caisson Delivery Transit Route portions of the ROI. While vessel noise is much lower in intensity than noise associated with pile installation and removal, vessel noise may still have the potential to cause behavioral changes to nearby wildlife, depending on the intensity, location, and duration in the context of baseline noise conditions. In contrast to pile installation noise, NMFS nor USFWS have not established behavioral thresholds for underwater vessel noise, so potential impacts are typically characterized in the context of baseline conditions and the sensitivity of individuals that may be exposed. As described in Appendix N, the waters of Sinclair Inlet have baseline noise levels ranging from 118 to 132 dB RMS, which is typical for an urbanized estuary with moderate levels of vessel traffic. Ambient noise levels in other portions of Puget Sound are also high due to existing vessel traffic. The Puget Sound hosts a large commercial fishing industry, 1.4 million recreational boaters, Washington State Ferries that travel east to west more than 500 times per day, and the Ports of Seattle

and Tacoma, which when combined are the nation's third largest container complex (Puget Sound Pilots, 2025). The overall average background sound level for the frequency range of 20 Hz to 20 kHz is estimated to range between 108 dB and 121 dB in the primary waterways of Puget Sound, and range from 120 to 140 dB in the Seattle-Tacoma port areas (WSDOT 2021). Over the 15-year duration of the project, up to 3 barges and 8 smaller vessels of varying sizes would be traveling across the Puget Sound per day through Southern Resident killer whale Critical Habitat. The sound levels emitted from these vessels would be 119 to 124 dB (Murchy et. al 2024, Haver et. al 2021), similar to the baseline noise levels typically present in Puget Sound and therefore would have an insignificant impact on the overall soundscape with this area of the Puget Sound and Southern Resident killer whale Critical Habitat.

Similarly, the Caisson Delivery Transit Route follows established vessel shipping routes that are regularly travelled by large cargo vessels. In all portions of the ROI, project related vessel noise is not expected to cause a significant increase in underwater noise when compared to ambient conditions.

Methods Regarding Impacts to Marine Vegetation and Habitats

For marine vegetation, analysis of impacts include determining the overlap between the mapped coverage (observed and inferred; see Figure 3.5-6) and the area of project actions that would result in the removal of macroalgae: dredging, fill, and net increase in over-water coverage. The analysis also considers other potential impacts to marine vegetation in the Demolition, Construction, Operations ROI from project activities, although these cannot be quantified.

For invertebrates that use soft-bottom habitats, the area of effect was calculated by determining the full area over which dredging and fill would occur. Quantification of effects to invertebrate species that attach to human-made structures considered the number of piles to be removed (habitat removed) and the number of new piles to be installed (new habitat) above and below mean lower low water (MLLW). The analysis also considers other potential impacts to invertebrates in the Demolition, Construction, Operations portion of the ROI from project activities, although these cannot be quantified.

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Upland construction at NAVBASE Kitsap-Bangor would increase ambient airborne sound levels within the Proposed Action location (see Appendix N) as well as create visual disturbance to species and removal of habitat. In order to avoid impacts to nesting murrelets, all construction would occur from September 24 – March 31 (BIO MGMT BANGOR-1). Access and use of the Radio Hill complex expansion area would continue throughout the proposed project timeframe and would be subject to noise associated with vehicles and construction equipment staging and other general construction activity.

The Navy is conducting an ESA section 7 consultation with USFWS regarding impacts to ESA-listed marbled murrelet with implementation of Alternative 2 (Preferred Alternative) (see Table 3.5-7). All conservation measures and BMPs discussed during consultation for the Proposed Action, as well as proposed mitigation, would be considered for inclusion into the final version of this EIS.

3.5.3.3 Impact Analysis for Alternative 1: No-Action

No project-related effects to biological resources at NAVBASE Kitsap-Bremerton or NAVBASE Kitsap-Bangor would occur with implementation of the no-action alternative.

3.5.3.4 Impact Analysis for Alternative 2 (Preferred Alternative)

Potential impacts to biological resources specific to Alternative 2 are described below.

NAVBASE Kitsap-Bremerton

Alternative 2 includes construction of a new saltwater cooling and distribution system for M2D2. Until the saltwater distribution system construction is complete, a temporary barge-mounted saltwater intake and pump system would connect to the existing saltwater system as described in Section 2.3.2.4. This temporary barge-mounted system would meet Best Technology Available (BTA), as defined in CWA Section 316(b) (40 CFR 125 Subpart J), and intake structures would be designed to minimize impacts to marine organisms, including juvenile salmonids and marine bird and mammal prey species, from entrainment. This system will also comply with PSNS & IMF NPDES permitting requirements for saltwater cooling effluent discharges into Sinclair Inlet.

As described in Section 2.4.1.4, up to 18 temporary mooring buoys would be installed in a nearby location (to be determined). Steel plate anchor installation and removal for the buoys would create temporary turbidity and noise (if installed using traditional pile driving methods). Turbidity created is anticipated to be localized to the anchor footprint and short-term. Noise created from using pile driving methods may disturb birds, fish, and marine mammals. BMPs would be implemented to minimize impacts (Table 3.5-12: BIO MGMT BREM-5, -6, -7, -8, and -11). Moored barges would be up to two at a time side by side, creating overwater coverage and increased artificial night lighting. Moorings would be installed in deeper waters where aquatic vegetation is likely not present or is sparse. Lighting and shade would not be permanent, as conditions would be returned to pre-existing with removal of moorings and construction barges.

Demolition and Construction-related Impacts

Under Alternative 2, in-water work would begin in 2027 and conclude in 2041 (see Table 2-7 Construction Sequencing). A maximum of up to 5,410 concrete and steel pipe piles and 1,950 linear feet of steel sheet piles would be permanently installed. A total of 4,891 existing piles would be removed during demolition of piers and wharves with up to 29 of the total piles removed consisting of potentially creosote-treated timber piles.

Marine Mammals

As detailed in Table 3.5-2, there are 15 species and distinct population segments of marine mammals that may be present in the vicinity of NAVBASE Kitsap-Bremerton during project demolition and construction, including three ESA-listed marine mammals. Project impacts to marine mammals could result from activities such as dredging, marine demolition, pile driving/extraction activities, and increased vessel traffic during construction. The Navy has initiated section 7 consultation with NMFS on ESA-listed marine mammal species and has prepared a request to NMFS for an LOA for incidental take of marine mammals as required under the MMPA.

Exposure to Chemical Contaminants, Waste, and Pollutants: Sediment-bound contaminants such as mercury or PCBs (see Section 3.4) may be resuspended during in-water construction activities. BMPs (e.g., turbidity reducing practices [see Appendix A: BMPs WATER MGMT BREM-10, -11, -12, -13, -14, -15, and -16]) would be implemented to reduce sediment turbidity and minimize marine mammals from being directly exposed to resuspended sediment. Resuspension of sediment during in-water construction activities could further expose marine mammal prey species to bioaccumulating contaminants, as described under *Fishes*. However, marine mammals forage over relatively large areas and are not expected to be foraging exclusively in the area affected by increased turbidity during marine construction activities.

Construction in or near water also has potential to release potentially hazardous materials through spills or the creation of debris containing contaminants that may enter the water. The implementation of BMP BIO MGMT BREM-9 would ensure that potential contaminants (e.g., concrete, grout, pile debris, or other materials) are contained and removed. The potential for accidental spills of contaminants (such as oil or fuels) would be minimized and immediately cleaned up if they occur (Appendix A: BMPs WATER MGMT BREM- 17, -18, -19, and -20). As a result, marine mammals would not be significantly exposed to harmful levels of contaminants during project activities and impacts would be expected to be negligible.

Vessel Strikes, Entrainment, Entanglement, or Other Direct Interactions with Construction Activities: There is a low potential for injury or mortality of marine mammals due to vessel strikes when construction-related vessels are in motion. However, marine mammals are agile swimmers and unlikely to directly interact with slow-moving construction vessels or be entrained in dredging equipment. The potential for vessel strikes to occur would be avoided or minimized through low vessel speed and crew vigilance (Table 3.5-12: BMP BIO MGMT BREM-2).

Marine mammals are susceptible to injury or drowning if they become entangled in loose lines, cables, hoses, or similar materials. Entanglement of marine mammals in construction-related materials would be minimized through BMP BIO MGMT BREM-11 (Table 3.5-12). Project workers would be briefed on BMPs related to marine mammals prior to construction and will not haze or directly interact with marine mammals as specified in BMP BIO MGMT BREM-12 (Table 3.5-12). Although construction vessel traffic and dredging activities may temporarily result in behavioral changes to marine mammals if they happen to be present at the site, these activities are not expected to result in harm to marine mammals.

Injury, Physiological Changes, and Behavioral Changes from Noise: Based on the estimated underwater sound levels with BMPs implemented (see Appendix N), potential take of marine mammals would only occur from exposure to elevated noise levels during pile installation and removal. This impact would occur for extended periods (during daylight hours, 6 days per week, intermittently for a maximum of 214 days in a construction year) over the 15-year construction period (See Table 2-7) but would cease once construction is complete. Noise propagates more efficiently though water than air, so the area where marine mammals may be exposed to airborne noise is much smaller than the area affected by underwater noise. As a result, underwater noise levels are utilized to establish the potential area of impacts for marine mammals during pile driving. Potential impacts to marine mammals from underwater noise are summarized below and described in more detail in Appendix N.

As described in Appendix N, pile driving and removal would generate underwater noise that could induce AUD INJ or cause temporary changes to hearing capacity (TTS), or behavioral changes to marine mammals in the vicinity. NMFS has established marine mammal thresholds to evaluate the potential for underwater noise to cause injury or behavioral effects (see Appendix N). Noise that has the potential to cause AUD INJ to a marine mammal or marine mammal stock in the wild is considered Level A harassment as defined by the MMPA. Noise that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing TTS or disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, resting, or sheltering is considered Level B harassment. Level A is the more severe form of harassment because it may result in AUD INJ, whereas Level B only results in behavioral disturbance without the potential for injury.

NMFS finalized updated acoustic threshold levels for determining the onset of AUD INJ in marine mammals in response to underwater impulsive and non-impulsive sound sources (NMFS 2024). The

criteria use cumulative sound exposure level (SEL_{cum}) metrics (decibel [dB] SEL_{cum}) and peak pressure rather than the decibel (dB) root mean square (RMS) metric that had been used prior to 2018. NMFS equates the onset of AUD INJ with Level A harassment under the MMPA and "harm" under the ESA. The updated AUD INJ thresholds are presented in Appendix N. Level B harassment is considered to occur when marine mammals are exposed to impulsive underwater sounds greater than 160 dB from impact pile driving and to non-impulsive/continuous underwater sounds greater than 120 dB RMS (e.g., from vibratory pile driving/extracting) (Appendix N). Behavioral harassment may or may not result in a stress response. In general, vibratory pile driving produces larger Level B exposure zones, and impact pile driving produces larger Level A exposure zones for a given pile type and size.

There are several species of marine mammals that rarely occur in Sinclair Inlet (see Table 3.5-2), such as large whales (i.e., gray or humpback whales), medium whales (i.e., killer whales) and small porpoises (i.e., harbor porpoises), and thus have a low potential of being exposed to underwater noise. However, other species, such as harbor seals and California sea lions, frequently occur in Sinclair Inlet (see Table 3.5-3) and are more likely to be exposed to underwater noise. Elevated underwater sound levels in exceedance of the thresholds described in Appendix N may have physical or behavioral effects on marine mammals, would be relatively localized within Sinclair Inlet, and would occur on an intermittent basis throughout the multi-year construction period. During periods of construction, piles would be installed during daylight hours by impulsive methods (impact pile driver) and non-impulsive methods (vibratory pile driver). The number of pile driving days varies between the two action alternatives, as described in Sections 3.5.3.5 and 3.5.3.6, but would not exceed 214 days in a given construction year due to the requirement of working within the allowable in-water work window (USACE 2017).

Vibratory pile driving/extraction activities are continuous, lower intensity sound sources compared to impact pile driving. Both methods may cause behavioral changes to marine mammals exposed to the underwater noise that they generate. Sound from these sources is discussed further in Appendix N. The Navy and NMFS will coordinate to further refine the analysis of the effects of sound from construction activities on marine mammals and the resulting consultation documents would be included as an appendix in the Final EIS. Potential impacts from pile driving would be minimized through preferential use of vibratory driving, the use of bubble curtains or similar attenuation system during impact driving of steel pipe piles, soft-start pile driving procedures, and monitoring with the implementation of shutdown zones (Table 3.5-12: BMP BIO MGMT BREM-5, -6, and -7, respectively). Injury to most marine mammal species (i.e., Level A harassment), including all ESA- listed marine mammal species, would be avoided through the implementation of shutdown zones (Table 3.5-12: BMP BIO MGMT BREM-7). Marine mammal monitors would ensure that pile driving halts whenever a marine mammal is entering or about to enter the applicable shutdown zone and that activities would not resume until that animal has left the zone or has not been sighted for 15 minutes.

A request for take of a small number of Level A exposures may be authorized by NMFS for species that regularly occur in Sinclair Inlet and are habituated to Navy operations there (such as harbor seals and California sea lions). Potential acoustic effects on marine mammals from exposure to elevated noise levels during pile installation and removal may occur but would be intermittent and limited to short-term behavioral changes, as further detailed in Appendix N. Potential effects to marine mammals would be avoided or minimized due to the prudent implementation of BMPs (Table 3.5-12).

For those marine mammal species that regularly occur in the Demolition, Construction, Operations portion of the ROI, an estimate of the potential exposures to underwater noise was developed using at-sea densities developed by the Navy (Navy 2019; Navy 2020c) and pinniped monitoring conducted at NAVBASE Kitsap-Bremerton (Navy 2025), as presented in Appendix N. This is a reasonably conservative estimate based on the best available data, and likely overestimates the actual number of exposures that may occur.

For those marine mammal species that rarely occur in the Demolition, Construction, Operations portion of the ROI, only a rough estimate of potential exposures to underwater noise in excess of NMFS thresholds can be made. Rarely occurring species are those species with few and highly intermittent confirmed sightings, or no confirmed sightings in the Demolition, Construction, Operations portion of the ROI but the distribution of the species is near enough to the area that species could reasonably occur there. While there are some differences in the pile driving scenarios between Alternatives 2 and 3, resolving any difference in the potential exposures of these species would be speculative. As a result, the estimates of Level B harassments (potential behavioral effects) for those species would apply to both Alternatives 2 and 3, as presented in Appendix N. Implementation of shutdown zones, as described above, would prevent large whales from being exposed to Level A harassment.

The majority of the potential exposures of marine mammals to underwater noise would result in, at most, behavioral changes as determined through the use of underwater noise thresholds established by NMFS which are presented in Appendix N. A comprehensive review of acoustic and behavioral responses to noise exposure by Nowacek et al. (2007) concluded that one of the most common behavioral responses is displacement. Marine mammal monitoring during prior construction at NAVBASE Kitsap-Bremerton/Bangor indicates that displacement of pinnipeds is unlikely. California sea lions and harbor seals were present during impact installation and vibratory removal of piles at NAVBASE Kitsap-Bremerton in February 2014 and November 2014 to February 2015 (Northwest Environmental Consulting, 2014, 2015). In February 2014, hundreds of California sea lions were observed basking on the PSB and swimming within the Level B disturbance zone. Behaviors observed included hauling-out (resting), foraging, milling, and traveling, and no visible behaviors indicating a reaction to noise disturbance were observed. Harbor seals were frequently observed near Explosive Handling Wharf #1 at NAVBASE Kitsap-Bangor through multiple years of construction at that site, with no substantial changes in occupancy observed (Hart 2013, 2014, 2015). California sea lion and harbor seal and occupancy response is expected to be similar during construction activities at NAVBASE Kitsap-Bremerton.

Potential impacts from pile driving would be minimized through implementation of a soft-start approach, preferential use of vibratory driving, the use of bubble curtains or similar attenuation system during impact driving of steel pipe piles, and monitoring with the implementation of shutdown zones (Table 3.5-12: BMP BIO MGMT BREM-5, -6, and -7, respectively). Nevertheless, some exposure is unavoidable. The practical spreading transmission loss model (see Appendix N) was used to calculate the expected noise propagation from pile driving/extracting activities, using representative source levels to estimate the zone of influence or area exceeding the noise criteria.

Using the thresholds and methods described in Appendix N, modeled distances to noise above NMFS thresholds for AUD INJ and behavioral harassment have been generated for Alternative 2 and are presented in Table 3.5-14 and Table 3.5-15. As reflected in these tables, NMFS establishes specific thresholds of AUD INJ by the following marine mammal hearing groups: low-frequency cetaceans (baleen whales); high-frequency cetaceans (dolphins, killer whales, beaked whales); very high-frequency

cetaceans (porpoises); phocids (harbor seals and elephant seals); and otariids (sea lions). These AUD INJ thresholds are for cumulative noise exposure, and assume that an individual is proximal to the pile for the entire duration of pile driving for the day. Since the likelihood of an individual remaining in that area for the entire duration is low, this is a conservative method to estimate the potential for AUD INJ. Preliminary estimates of the exposures of marine mammals that may occur in the Demolition, Construction, Operations portion of the ROI are provided in Appendix N.

As shown in the Table 3.5-14 and Table 3.5-15, the largest pile types driven would be 48-inch steel. It is important to note that modeled distances, particularly for vibratory installation, can appear very large. As discussed in Appendix N, the degree to which underwater noise propagates away from a noise source is dependent on a variety of factors, most notably by bathymetry and the presence or absence of reflective or absorptive conditions including the sea surface and sediment type. For example, due to the shape of Sinclair Inlet and the adjoining waters, the furthest distance that pile driving sound could transmit is approximately 5.5 miles (8.9 km), which is much smaller than some of the modeled distances for vibratory driving. The noise affected areas are assumed to take a circular shape around the notional pile being driven, but land features (e.g., shorelines) may result in some areas being "clipped," as sounds will attenuate or be blocked/shadowed as they encounter land or other solid obstacles. Reflection of sound also interferes with propagation of sound waves. As a result, the ranges calculated by the model may not actually be attained and are expected to overestimate the actual distance to expected sound levels. Table 3.5-14 and Table 3.5-15 provide a summary-level look at distances modeled to AUD INJ and behavioral harassment thresholds based on the maximum pile strikes per day and vibratory installation/extraction minutes per day. Appendix N provides detailed distances and exposures for all pile types and total days proposed to install/extract a specific pile type. This detail was used for preparation of an LOA permit application for incidental harassment as required under the MMPA.

Regarding the significance of the exposure of marine mammals to noise above the Level B thresholds, it is important to consider the ambient (typical background) noise conditions within the ROI, as marine mammals that inhabit areas with high background noise may be acclimated to it (Navy 2024). Studies conducted by the Navy have found that ambient underwater noise levels in Sinclair Inlet, along the NAVBASE Kitsap-Bremerton waterfront (measured at Pier 6) ranged from 118 dB RMS (minimum or "quiet" ambient) to 132 dB RMS (7 to 20 kilohertz), with a mean value of 128 dB referenced to a pressure of 1 microPascal (dB RMS re 1 µPa) (Navy 2016b). Note that this mean value is above the 120 dB RMS used as the Level B threshold for continuous noise sources, such as vibratory pile driving/extracting. With this in mind, vibratory pile driving noise would be masked by ambient noises over areas farther from the pile driving location. As discussed earlier in this section, a soft start approach would be used during impact pile driving (Table 3.5-12: BMP BIO MGMT BREM-6) that may provoke a startle response from nearby seals or sea lions but would allow for them to move away from the noise source before the pile driver is operated at full capacity. See Appendix N for a more detailed analysis of potential noise impacts to marine mammals. With consideration of the factors described above, and through the implementation of BMPs as indicated, the expected level of unavoidable exposure is anticipated to have a negligible impact to local populations of marine mammals.

Table 3.5-14 Alternative 2 (Preferred Alternative): Calculated Maximum Distances to AUD INJ and Behavioral Harassment Marine Mammal Thresholds During Impact Pile Driving

Pile Type	Pile Size (in)	Level B Isopleth	Level B ZOI	Level A Isopleth							
		All Hearing Groups[1]	All Hearing Groups[1]	Low-Frequency Cetaceans				High-Frequency Cetaceans	Very High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
Concrete	18	151 ft (46 m)	0.003 sq mi (0.007 sq km)	289 ft (88 m)				37 ft (11 m)	446 ft (136 m)	256 ft (78 m)	96 ft (29 m)
Concrete	24	518 ft (158 m)	0.03 sq mi (0.08 sq km)	845 ft (258 m)				108 ft (33 m)	1307 ft (398 m)	751 ft (229 m)	280 ft (85 m)
Steel	36	1,522 ft (464 m)	0.23 sq mi (0.602 sq km)	3,924 ft (1196 m)	500 ft (152 m)	6,068 ft (1849 m)	3,486 ft (1,063 m)	1,299 ft (396 m)			
Steel	48	961 ft (293 m)	0.08 sq mi (0.198 sq km)	1,340 ft (408 m)	171 ft (52 m)	2072 ft (631 m)	1190 ft (363 m)	444 ft (135 m)			
Steel Sheet	20 or 24	3,281 ft (1,000 m)	0.69 sq mi (1.800 sq km)	7,250 ft (2,210 m)	924 ft (282 m)	11,212 ft (3,417 m)	6,442 ft (1963 m)	2,401 ft (732 m)			

Notes: See Appendix N for methods used to develop these distances. Sound level source: Navy 2022. 1- Distances to the 160 dB RMS Threshold for impact pile driving.
Legend: ft = feet; in = inches; m = meters; sq km = square kilometers; ZOI = Zone of influence

Table 3.5-15 Alternative 2 (Preferred Alternative): Calculated Maximum Distances to AUD INJ and Behavioral Harassment Marine Mammal Thresholds During Vibratory Installation/Extraction

Installation/ Extraction	*Pile Type*	*Pile Size (in)*	*Level B Isopleth*	*Level B ZOI*	*Level A Isopleth*							
			All Hearing Groups[1,2]	*All Hearing Groups[1,2]*	*Low-Frequency Cetaceans*				*High-Frequency Cetaceans*	*Very High-Frequency Cetaceans*	*Phocid Pinnipeds*	*Otariid Pinnipeds*
Installation	Steel sheet	20 or 24	60,623 ft (18,478 m)	5.77 sq mi (14.953 sq km)	221 ft (67 m)				85 ft (26 m)	181 ft (55 m)	285 ft (87 m)	96 ft (29 m)
Installation	Steel	36	152,283 ft (46,416 m)	5.77 sq mi (14.953 sq km)	556 ft (169 m)	213 ft (65 m)	454 ft (138 m)	715 ft (218 m)	241 ft (73 m)			
Installation	Steel	48	445,984 ft (135,936 m)	5.77 sq mi (14.953 sq km)	1,627 ft (496 m)	625 ft (191 m)	1,329 ft (405 m)	2,093 ft (638 m)	705 ft (215 m)			
Extraction	Timber	12 to 18	28,140 ft (8,577 m)	5.77 sq mi (14.953 sq km)	124 ft (38 m)				48 ft (15 m)	101 ft (31 m)	160 ft (49 m)	54 ft (16 m)
Extraction	Concrete	18 to 30	28,140 ft (8,577 m)	5.77 sq mi (14.953 sq km)	124 ft (38 m)	48 ft (15 m)	101 ft (31 m)	160 ft (49 m)	54 ft (16 m)			

Notes: See Appendix N for methods used to develop these distances. Sound level source: Navy 2022. 1-Distances to the 120 dB RMS Threshold for vibratory installation/extraction, assuming piles are being installed/removed concurrently.

Legend: ft = feet; in = inches; m = meters; sq km = square kilometers; ZOI = Zone of influence

Availability of Haulout Sites: Site preparation for some project components would require temporary relocation of the PSB floats, which are known to be used as haulout sites by a mean of 116 California sea lions (Navy 2025) during the in-water work window period, as described in Section 3.5.3.1 and Appendix I. Some of the PSB floats are moved on a daily basis to permit vessel movement into and out of the facility. Often times, California sea lions remain on the floats even as they are moved (Thorson, Philip., pers. comm. 2022). This suggests that the California sea lions are tolerant of position changes of the PSBs and/or becoming habituated to human activity.

California sea lion breeding and pupping takes place in California waters far to the south (during May – July); thus, the majority of the individuals utilizing the PSB floats are adult or subadult males that migrate north in search of food. Modification to some PSB buoys and anchors in the vicinity of the new M2D2 would be required for months at a time to allow construction vessels access to the work site. Once construction is complete, the PSB would be re-established to its existing alignment. California sea lions often utilize human-made structures such as floating docks and breakwaters as haulout sites. It is possible that PSB buoy modifications may have short-term behavioral effects on the local California sea lions, which may temporarily shift haul-out usage in the project vicinity, but temporary relocation of the PSB floats is expected to have negligible impacts to sea lion populations.

Displacement of Prey Species: Fish and invertebrates are important prey species for marine mammals in estuaries such as Puget Sound. The marine mammal species most likely to be foraging in Sinclair Inlet are harbor seals, and to a lesser degree, harbor porpoise (see Appendix I for life history and prey base information). While numerous California sea lions are known to haul-out at the project site, they make regular excursions to feed, with movements of animals largely driven by available prey resources within the Puget Sound, Fraser River, and offshore (DeLong et. al 2017). To the extent that project construction would result in the temporary displacement of local populations of fish and invertebrates, prey availability in the immediate vicinity of the project footprint could be temporarily reduced if sedimentation, turbidity, or noise causes shifts in the distribution of prey populations. In the context of the Puget Sound ecosystem, such shifts are expected to be minor, and marine mammals range over relatively large distances while foraging. Impacts to benthic habitats supporting prey species would be minimized through implementation of BMPs (Table 3.5-12: BMP BIO MGMT BREM-1, -2, -3, -4, -6, -7, -8, and -11).

Implementation of WATER MGMT BREM and BIO MGMT BREM BMPs (see Appendix A) would also minimize impacts to marine mammals.

Birds

Resident and migrant birds are expected to be present within the vicinity of proposed construction activities during the in-water work window established for juvenile salmonid avoidance (July 16 through February 15) (USACE 2017). Proposed construction activities have the potential to impact marine birds through visual disturbance, changes in prey availability, and elevated underwater and airborne noise (see below for analysis of noise impacts to ESA-listed marbled murrelet). Dredging and pile driving/extracting would produce noise and turbidity in the water column, affecting the availability of forage fish and benthic invertebrates, which are the prey base of many marine birds. Mortality of slow-moving and sessile (affixed) benthic species would result within the dredged and pile driving/extracting footprints. Increases in suspended sediment and underwater noise would temporarily deter forage fish from occurring in the area. These impacts to prey would extend from the dredged and pile footprints to where

the corresponding turbidity plume would not deter forage fish presence. These impacts would occur intermittently within the in-water work window of each construction year.

Disturbance from Human Activity: Construction activities would create an increase in human activity levels along the waterfront, potentially resulting in visual disturbance and increasing noise levels above ambient levels due to use of construction equipment, pile driving, and increased vessel activity (support barges, dredging). Increased human activity during construction and demolition as well as airborne noise associated with the project may result in birds avoiding existing or nearby habitat used for roosting, aborting feeding attempts, avoiding foraging habitats over one or multiple days, and masking calls. Pursuit-diving birds such as cormorants, murres, and pigeon guillemots may be affected through masking of calls while on the water and potential injurious effects while underwater. As described in Section 3.5.2.1, a bald eagle nest is located north of Pier B within a residential area, approximately 2,500 feet (762 meters) from the waterfront (Navy 2018). Nesting bald eagles are unlikely to be disturbed by human activity and increased airborne noise during construction due to the distance from the nest to the project sites as well as acclimation to the general industrial nature of NAVBASE Kitsap-Bremerton. No incidental takes of bald eagles are anticipated.

Underwater Noise: Proposed construction activities would result in increased underwater noise levels. Noise would be generated from small vessels and barge-mounted equipment such as generators, dredging, and pile extraction and installation activities. Noise levels from all activities except impact pile driving would typically not exceed underwater sound levels resulting from existing routine waterfront operations along the Bremerton waterfront. The most significant underwater noise source would be impact pile driving of steel pipe piles. Impacts of elevated noise levels due to pile driving were evaluated in the context of established criteria for ESA consultation with the USFWS on the threatened marbled murrelet. No criteria have been established for determining impacts of elevated noise levels on other marine bird species, some of which forage like the marbled murrelet. However, extensive scientific research has studied hearing abilities of terrestrial birds as compared to amphibious hearing of marine birds (Mooney et al. 2019; Larsen et al. 2020; Zeyl et al. 2022). Pursuit-diving birds (i.e., birds that pursue and capture their prey underwater using their wings to swim) include cormorants, grebes, and alcids (murres, murrelets, and pigeon guillemots). Therefore, conclusions about impacts on marbled murrelets were applied to other pursuit-diving bird species (see Appendix N for sound exposure criteria and thresholds for marbled murrelet).

While actively foraging, pursuit-diving birds dive repeatedly into waters of various depths and would potentially be exposed to elevated underwater noise during pile driving. When startled by loud sounds, their foraging patterns may be altered, and birds may flush or dive and swim away underwater. While underwater they would be susceptible to injury or behavioral disturbance due to elevated sound pressure waves generated by pile driving. Dabbling and diving ducks may also be susceptible to elevated underwater sound. Birds that feed on the surface such as gulls, shorebirds, and wading birds are unlikely to be affected by elevated underwater sound.

Marbled murrelet is federally listed as threatened under the ESA. Actively foraging marbled murrelets dive repeatedly into waters ranging up to approximately 160 feet (49 meters) in depth for periods ranging up to 60 seconds (Nelson et al. 2006). Foraging bouts typically last over a period of 27 to 33 minutes, with approximately 50 percent of the time spent underwater (Jodice and Collopy 1999). As described in detail in Appendix N, the USFWS uses underwater noise thresholds developed by the

Marbled Murrelet Hydroacoustic Science Panel (Science Applications International Corporation [SAIC] 2011) to determine the zones around a driven pile in which two general forms of injury might occur to diving marbled murrelets: (1) auditory injury (generally damage to sensory cells of the ear) beginning at 202 dB SEL_{cum}, and (2) non-auditory injury (trauma to non-auditory body tissues/organs) beginning at 208 dB SEL_{cum}. Since the underwater criterion for auditory injury was the lower of the two thresholds, this was the criterion used for assessing injurious impacts to pursuit-diving marine birds in this analysis. Currently there are no thresholds or guidelines for installation and extraction of piles with a vibratory driver. Because the sound levels generated by vibratory drivers are typically 20-30 dB lower than impact pile driving and do not produce waveforms with sharp rise times like impact pile driving, the affected areas would be so proximal to the pile as to be discountable and potential impacts on marine birds would be negligible from vibratory installation or extraction noise.

As shown in Appendix N and Table 3.5-16, potentially injurious noise levels (202 dB SEL_{cum}) range from 16 feet to as far as 1,154 feet (5 meters to 352 meters) from the pile, depending on the action alternative. Since estimates of the distances to thresholds involve the cumulative energy of all impact strikes over a 24-hour period, the affected area represents the maximum extent of potential auditory injury effects. Earlier in the construction day, the injury zone would be smaller, and only reach the maximum extent after all the pile strikes have been completed.

Table 3.5-16 Calculated Radial Distances to Underwater Marbled Murrelet Pile Driving Noise Thresholds for Impact Pile Driving for Both Alternatives

Pile Type	*Pile Size (in)*	*Distance to Threshold*		*Masking Zone ft (m)*
		202 dB Cumulative SEL (Auditory Injury) ft (m)	*208 dB Cumulative SEL (Barotrauma) ft (m)*	
Steel pipe piles	96-inch	1,154 ft (352 m)	459 ft (140 m)	551 ft (168 m)
Steel pipe piles	48-inch	249 ft (76 m)	99 ft (30 m)	551 ft (168 m)
Steel sheet piles	Sheets (20 or 24-inch)	394 ft (120 m)	157 ft (48 m)	138 ft (42 m)
Concrete piles	24-inch	46 ft (14 m)	18 ft (6 m)	138 ft (42 m)
	18-inch	16 ft (5 m)	7 ft (2 m)	138 ft (42 m)

Notes: Practical spreading loss model (15 log R, or 4.5 dB per doubling of distance) used for calculations. Assumes 8 dB attenuation for steel pipe piles. Cumulative SEL calculated as Single Strike SEL + 10* log (# of piles strikes). Up to 6,600 strikes per rig per day, with up to 5 rigs in use concurrently. Distances were modeled using proxy source levels for installing the largest pile types proposed (see Appendix N for figures). Calculations were completed using USFWS 2023 Calculator tool.

Legend: dB = decibels; ft = feet; m = meters; SEL = sound exposure level

As shown in Table 3.5-16, distances to thresholds based on criteria for marbled murrelet can be, for the sake of being conservative, applied to other marine birds with respect to conclusions and protective measures. The largest pile types installed under Alternative 2 would be a 48-inch diameter steel pipe and steel sheet piles for M2D2 construction and drydock upgrades. In accordance with Table 3.5-15, impact installation of steel sheet piles would create the largest zones of up to 394 feet (120 meters) around the

pile for which marbled murrelets diving underwater could be exposed to AUD INJ (202 dB SELcum threshold). See Appendix N for calculated distances to all pile types used.

Airborne Noise: Airborne noise levels from proposed construction activities are not expected to be injurious to birds within the Demolition and Construction ROI because the source levels for airborne noise from pile driving (vibratory: 96 dBA at 15 meters; impact: 110 dBA at 11 meters) are well below those known to cause injury to birds in laboratory situations (Dooling and Popper 2007). However, the USFWS (2013) has determined that airborne noise due to impact pile driving may behaviorally affect foraging marbled murrelets, based on the findings of the Marbled Murrelet Hydroacoustic Science Panel regarding non-injurious thresholds for pile driving noise (SAIC 2012) (Appendix N). Acoustic monitoring during construction at NAVBASE Kitsap-Bangor (Illingworth and Rodkin 2013) indicated that average airborne source levels during impact driving of 36-in steel piles were the same as, and in some cases lower than, 24-in steel piles. Under the Proposed Action, the maximum distance within which pile driving noise for steel pipe piles less than or equal to 36-inch diameter is expected to compromise communication between foraging murrelets would be 138 feet (42 meters) and for piles larger than 36-inch diameter, the distance would be 551 feet (168 meters) (Table 3.5-15) (USFWS 2013).

To prevent exposure to injurious or masking noise levels in the Demolition, Construction, Operations portion of the ROI, the Navy would implement the minimization measures and BMPs described in Table 3.5-12. The Navy would actively monitor the underwater auditory injury zone for impact pile driving or the 42-meter (138-ft)/168-meter (551-ft) masking zone, whichever is larger, depending on the pile type (Table 3.5-12: BMP BIO MGMT BREM-7). The likelihood of marbled murrelet exposure to injurious or masking noise from impact pile driving is minimized because these zones are small and can be effectively monitored during pile driving. Pile driving would cease if monitors detect marbled murrelets within the threshold distance, as defined in the marbled murrelet monitoring plans. Plans would be developed and implemented in consultation with USFWS. These protection measures may also benefit other pursuit-diving birds and other marine bird species as well. See Appendix N for a full analysis of noise impacts to marbled murrelet. Implementation of WATER MGMT BREM and BIO MGMT BREM BMPs would minimize impacts on other marine birds.

Marine Vegetation and Marine Invertebrates

Construction actions would have the potential to impact marine vegetation and benthic habitat in and near work areas during vessel movement (propwash), dredging, pile driving/extracting, marine demolition, and drilling activities, by disturbing marine vegetation, sessile invertebrates, and benthic communities, covering vegetation and sessile invertebrates with sediment, and/or affecting habitat through water quality changes (e.g., increased turbidity, changes in pH, exposure to disturbed contaminants, see Sections 3.3 and 3.4), and from shading. Increased turbidity and sedimentation could affect marine vegetation and sessile invertebrates within the Demolition, Construction, Operations portion of the ROI outside the immediate waterfront area.

Marine Vegetation: Table 3.5-17 summarizes quantifiable project components with the potential to impact marine vegetation. During construction activities under Alternative 2, marine vegetation would be removed over a total area of up to approximately 1.74 acres as a result of dredging. Additional impacts may occur over a larger area through settling of sediment that is disturbed during dredging. In areas where macroalgae are not currently present, permanent fill and areas of new overwater shading would reduce habitat suitability for marine vegetation. Temporary impacts to vegetation could occur in additional areas as a result of shading by construction barges and work platforms as well as turbidity and resuspension of contaminated sediment. The area of effect to marine vegetation from removal would be limited to project construction areas along the NAVBASE Kitsap-Bremerton waterfront at water depths that can support marine vegetation (observed to be approximately -60 feet and shallower in Navy 2021b) (Figure 3.5-13). The Navy will implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under Section 404 of the Clean Water Act. No federal or state-protected species of marine vegetation would be affected.

Table 3.5-17 Comparison of Project Components with the Potential to Impact Marine Vegetation

Impact	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
Dredging area – intersection with mapped aquatic vegetation	75,794 square feet (1.74 acres)	65,239 square feet (1.50 acres)
Dredging area – in areas with water depth less than 30 feet – Intersection with mapped aquatic vegetation	55,757 square feet (1.28 acres)	40,075 square feet (0.92 acres)
Net increase in overwater coverage (square feet) (shading of existing vegetation habitat)	59,677 square feet (1.37 acre)	99,752 square feet (2.29 acres)
Temporary fill area	2.02 acres	0
Permanent fill area	11.25 acres	19.59 acres

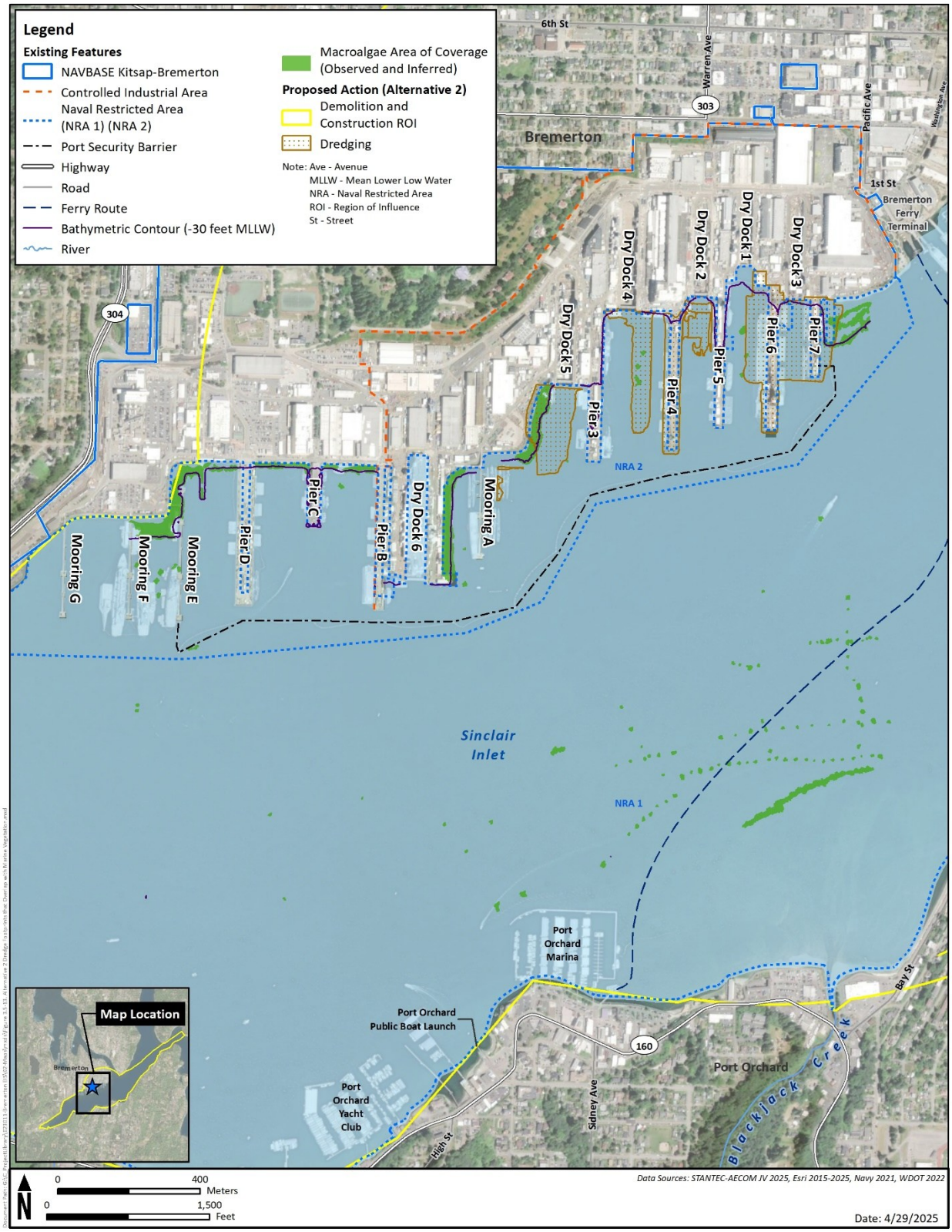

Figure 3.5-13 Alternative 2: Dredged Footprints that Overlap with Marine Vegetation

Loss of marine vegetation through physical removal would be short-term if vegetation is able to recolonize the disturbed area, but would be permanent in areas of fill, and in areas where deeper water depths following dredging are incapable of supporting marine vegetation (greater than 60 feet [18 meters], although most marine vegetation occurs at depths of 30 feet [9 meters] or less). The most common macroalgae along the NAVBASE Kitsap-Bremerton waterfront, sea lettuce (*Ulva* sp.), is an early colonizer of disturbed areas and would be expected to recover within a growing season. Over the long-term, dredging and removal of contaminated sediment could have a beneficial impact on local populations of marine vegetation. Construction vessels would have the potential to introduce invasive flora and fauna into the project area that could disturb, compete with, or prey on native marine vegetation. BMP BIO MGMT BREM-16 (Table 3.5-12) would help prevent the spread of invasive species on vessels.

Water quality impacts on marine vegetation during construction would be short-term and localized to in-water work areas. Effects to marine vegetation from localized water quality changes caused by disturbance of sedimentation during construction would be limited to the period of in-water work, which would be up to 214 days during each construction year for 15 years under Alternative 2. BMPs to protect water quality by reducing turbidity and release of petroleum and other contaminants (BMP WATER MGMT BREM-5, -6, 7, -8, -9, -10, -11, -12, -13, -14, -15, -16, -17, area over which dredging and fill would occur, -19, and -24 [see Appendix A]) would prevent or minimize water quality impacts to marine vegetation.

Marine Invertebrates: Vessel movement, temporary barges moored, dredging, marine fill, pile driving/extracting, marine demolition, and drilling activities would affect benthic invertebrates that inhabit the soft substrates of the project work areas by removal (dredging), loss of habitat (fill), crushing (pile driving), overwater shade, and covering/smothering by sediment. There would also be impacts to water quality and habitat during dredging that would create localized increased turbidity, reduced dissolved oxygen, hypoxia, and changes in pH. In areas where project activities disturb contaminated sediment, exposure to contaminants would also be a concern.

Table 3.5-18 summarizes quantifiable project components with the potential to impact marine invertebrates under Alternative 2. During construction, Alternative 2 would result in the loss of benthic invertebrates over an area of approximately 48 acres through dredging and fill. If benthic invertebrates are present in areas to be dredged, dredging equipment would physically remove invertebrates, and thus benthic infauna and epifauna would be vulnerable. It is assumed that 100 percent mortality of invertebrates in these areas would occur. Invertebrates would be able to recolonize soft sediment from nearby areas over an estimated time period of a few months to 2 years (Parametrix 1999; Wilbur and Clarke 2007), although the species composition could be altered.

Permanent impacts would be limited to approximately 11 acres (areas of permanent fill). Additional impacts may occur over a larger area through settling of sediment that is disturbed during dredging. Invertebrates that are associated with hard substrates would be lost through demolition and removal of in-water structures. Introduction of new structures that are available for colonization would offset some of these losses to habitat. However, there is also the potential colonization of these structures by invasive species. There would be a loss of invertebrates associated with demolition of 4,891 piles, but a long-term increase in similar habitat associated with a slight net increase in in-water structures when the new piles and sheet piles are considered. It is expected that the species composition of invertebrate

populations in the Demolition, Construction, Operations portion of the ROI could shift as a result of the project, with an increase in species that occur on human-made structures and a decrease in benthic species that occur in soft-bottom habitats with localized transition to fill and hard bottom. Other long-term changes to habitat (e.g., water depth, presence of overwater structures) could also affect species composition in affected areas. The Navy will implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under Section 404 of the Clean Water Act.

Table 3.5-18 Comparison of Project Components with the Potential to Impact Marine Invertebrates under Alternative 2 and 3

Impact	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
Dredging area (acres)	36.92 acres	69 acres
Dredging quantity (cubic yards)	867,450 cubic yards	1,651,000 cubic yards
Temporary fill area (acres)	2.02 acres	0
Permanent fill area (acres)	11.25 acres	19.59 acres
Number of new piles	5,410	3,303
Linear feet of new sheet piles	1,950	1,665
Total number of piles removed	4,891	796
Timber piles removed (subset of total)	29	27

Noise associated with construction could adversely affect invertebrates by causing behavioral impacts that lead to reduced fitness (Murchy et al. 2019; Roberts et al. 2016) (see Appendix N). Increased noise associated with construction would be intermittent and localized to specific construction areas, and would be limited in duration to the construction period. Noise impacts from vessels are already occurring at NAVBASE Kitsap-Bremerton but would occur to a greater degree with more use of the area by construction vessels.

Activities that disturb sediment could adversely affect water quality by temporarily suspending sediment in the water column. High levels of suspended sediment can harm marine invertebrates by clogging feeding mechanisms and smothering (Erftemeijer and Lewis 2006). Filter-feeding organisms such as bivalves would be most at risk. Disturbing or removing bottom sediment could also adversely affect water quality by releasing contaminants that are present in the sediment into the water column. Utilizing a closed environmental clamshell bucket, where practicable, would minimize the turbidity during dredging and transfer of dredged material to barges (See Section 3.3). Based on a project-specific sediment transport study (Appendix H), turbidity impacts associated with dredging, marine demolition, and construction activities are not expected to exceed the threshold of the regulatory limits of 5 NTUs over background at 150 feet from work location. Further, in the very few instances during the busiest in-water construction years and modeling multiple concurrent activities, turbidity impacts were temporary and localized to within the PSB/NRA#2 (see Appendix H). Impacts are expected to be short term and post-dredge surface sediment will meet Sediment Management Standards, reducing eco risk to acceptable levels, after construction is completed.

Temporary effects to marine invertebrates from increased noise and localized water quality changes during construction would be limited to the period of in-water work, which would be up to 214 days each year under Alternative 2. The potential for water quality impacts to invertebrates would be reduced through BMP WATER MGMT BREM-7, -8, -9, -10, -11, -12, -13, -14, -16, -17, -18, -19, -24

(Appendix A). Additionally compliance with the approved WQMPP will minimize impacts associated with construction activities that disturb sediment.

Long-term improvements to water quality would result from dredging and removal of contaminated sediment and removal of 29 creosote-treated timber piles and would result in beneficial impacts to water quality habitat for marine vegetation and invertebrates. Removal of treated timber piles is one of the objectives of the DNR Creosote Removal Program which is working to reduce sources of PAHs in Puget Sound by removing structures and debris that are treated with creosote; reducing human exposure to creosote on beaches; and improving the quality of nearshore habitats for forage fish and other key species.

Construction vessels are a potential source of invasive invertebrate species, which may be transported in ballast water or via hull fouling. The potential for introduction of invasive species by vessels would be reduced through BMP BIO MGMT BREM-16 (Table 3.5-12), which requires decontamination of vessels and marine equipment in accordance with WDFW guidance.

The Navy is consulting with NMFS under the ESA for potential effects to the proposed threatened sunflower sea star. While sunflower sea stars populations have decreased dramatically in Puget Sound, they may be present near the NAVBASE Kitsap-Bremerton waterfront area, their presence cannot be ruled out. If present, this species would be susceptible to the types of impacts to marine invertebrates described in the preceding paragraphs. Benthic surveys planned for summer of 2025 within the Demolition, Construction, Operations portion of the ROI will provide additional information regarding the presence of sunflower sea star and results will be incorporated into the Final EIS.

Fishes

In-water construction activities, including dredging, fill placement, structure demolition, pile driving, and dry dock/pier installation could impact fishes through alteration/removal of habitat, displacement of prey species, changes to water quality (i.e., increased turbidity, reduced dissolved oxygen), mobilizing sediment (and contaminants) into the water column, increasing underwater noise levels, and changing light transmissivity in the Demolition, Construction, Operations portion of the ROI. Many of these effects would last for days or months through the course of the in-water work window, but most effects would be localized to the NAVBASE Kitsap-Bremerton waterfront. Underwater noise from pile driving would have the greatest impact on fishes within the Demolition, Construction, Operations portion of the ROI. However, BMPs, such as in-water work timing restrictions, a preference for the use of vibratory driving, the use of bubble curtains or similar attenuation systems for impact driving of steel pipe piles, and soft-start pile driving procedure (Table 3.5-12: BMP BIO MGMT BREM-4, -5, and -6), would be implemented to reduce the degree of adverse impacts from pile driving as well as all other in-water construction activities. During installation of the cofferdam, entrainment of fishes is likely to occur. Although BMPs would be implemented to deter fish from entering the cofferdam closure (use of a bubble screen), bubble curtain use may also deter fish already entrained in the cofferdam from leaving. Procedures (BMP BIO MGMT BREM-18) may also be established for safely removing fish entrained and releasing them back into Sinclair Inlet before the cofferdam is completely de-watered. If feasible, these measures will help minimize impacts to fishes, including ESA-listed fish and Federally Managed Fisheries.

Turbidity: Increased suspended sediment (and resulting turbidity) during dredging and pile driving/extracting activities would degrade water quality and may adversely impact fishes through visual

impairment, inhibition of chemical cues, reduction in oxygen uptake, and physical injury such as clogging gills. Suspended sediment can produce short- and long-term responses from aquatic species, depending on the quantity, quality, and duration of exposure (Fleming et al. 2005). Studies investigating impacts on steelhead and coho salmon from large scale sediment dredging have shown that increased turbidity levels from these activities did not cause salmonid gill damage, although other adverse effects were evident (Redding et al. 1987; Servizi and Martens 1991). Redding et al. (1987) found that coho and steelhead were more susceptible to bacterial infection and displayed reduced feeding rates when exposed to elevated turbidity levels. Servizi and Martens (1991) found that coho were more susceptible to viral infections when exposed to elevated turbidity and suggested that other impacts include reduced tolerance to environmental changes. Reviews of impacts to fishes from dredging, specifically, found that mortality of early lifestages (eggs and larvae) were more likely compared to adult life stages that typically experienced behavioral impacts (Wenger et al. 2017). Behavioral effects such as changes in migratory patterns, social disruption, and predator-prey avoidance could produce long-term effects depending on durations of activity and exposure (Kjelland et al. 2015). Early life stages of fish are especially susceptible to contaminated sediment as exposure can affect embryonic and larval stages of fish (i.e., directly laying eggs within contaminated sediment) (Boulanger 2017). A study that looked at exposure to polycyclic aromatic hydrocarbons (PAHs) found that pelagic and benthic fish are exposed through diet, respiration, and dermal absorption where contaminants enter the blood stream and travel to other organs. Exposure to contaminants ultimately impact survival, development, growth, and reproduction (Boulanger 2017). Fish exposed to contaminated sediment can impact species that prey on them such as other fish species, birds, and marine mammals.

Based on a project-specific sediment transport study (Appendix H), turbidity impacts associated with dredging, marine demolition, and construction activities under Alternative 2 are not expected to exceed the threshold of the regulatory limits of 5 NTUs over background at 150 feet from work location. Further, in the very few instances during the busiest in-water construction years and modeling multiple concurrent activities, turbidity impacts were temporary and localized to within the PSB/NRA#2 (see Appendix H).

In-water work would occur during the approved in-water work window of July 16 through February 15, when the lowest numbers of juvenile salmonids are expected to be encountered in the project area compared to other times (USACE 2017). However, adult salmonids such as Chinook (Puget Sound ESU), and to a lesser extent, steelhead (Puget Sound DPS) and coho are present at times in nearshore waters adjacent to the dry docks. Adult bocaccio rockfish and juvenile and adult yelloweye rockfish (Puget Sound/Georgia Basin DPS), if present, would occur in the deeper portions of Puget Sound and either beyond any impacts associated with turbidity or expected to avoid the area with little disruption to behavior. Juvenile bocaccio rockfish rearing habitat is present within the Demolition, Construction, Operations portion of the ROI and turbidity impacts may reach the distance to rearing habitat; however, presence would be assumed to be extremely rare and if present would be expected to avoid the area with little disruption to behavior. Bull trout (Coterminous U.S. DPS) are expected to be rare within the Demolition, Construction, Operations portion of the ROI. Although they migrate along nearshore habitats where there is a potential of exposure to degraded water quality from turbidity, bull trout have not been recorded in beach seines (Fresh et al. 2006), trawl surveys (Navy 2020b), detected in light traps or SCUBA surveys (Lowry et al. 2013; Frierson et al. 2016), or collected during entrainment studies (Pacunski et al. 2022). Other fish species that are likely to be present within the in-water work window, including those with designated EFH, include forage fish (Pacific herring, northern anchovy, Pacific sand

lance), various flatfishes species (e.g., English sole, rock sole, and sand sole), as well as other rockfish species (copper rockfish, brown rockfish) (see Appendix K). If these fish species are present, they may be affected by turbidity in the water column, but fish are likely to avoid the localized areas of impact, returning when turbidity impacts subside (hours to days).

The proposed impact avoidance and minimization measures would reduce impacts to fish species (see Appendix K) from turbidity and sedimentation, including temporary and localized exposure to suspended contaminated sediment (BMP WATER MGMT BREM-9, -10, -11, -12, -13, -14, -15, -16, and -24 [see Appendix A]).

As discussed above for marine vegetation and marine invertebrates, removal of contaminated sediment through dredging and removal of up to 29 potentially creosote-treated timber piles would result in beneficial impacts to fish through improved benthic and nearshore habitats (see Section 3.3 for further discussion). The treatment system designed to remove suspended solids and contaminants regulated by the construction stormwater NPDES permit would treat groundwater collected during construction prior to discharge into Sinclair Inlet to meet permitted discharge limits. Upland construction activities would have the potential to impact surface water resources. The Proposed Action would be covered under either the existing EPA 2022 Stormwater Construction General Permit or an individual permit issued by EPA Region 10. The NPDES permit would contain requirements for management and treatment of stormwater and include the preparation of a SWPPP and associated BMPs (see Appendix A).

Underwater Noise: Noise from construction activities could cause short-term (during daylight hours) impacts to fish through interruptions of foraging/feeding, reduction in prey availability, and interruption of resting periods. During impact pile driving activities, some fish species that may be in close proximity to the piles being driven may suffer mortality or injury, such as hair cell damage of the inner ear and minor internal or external hematoma (bruising) (Appendix N). Fish are not susceptible to PTS because, unlike marine mammals, the hair cells of their inner ear used for hearing regenerate (Hastings et al. 1996). Fishes may experience TTS, which results in a “temporary” reduction in hearing sensitivity caused by an intense sound. After the sound is stopped, normal hearing ability is expected to return over a period of time, which can range from less than 24 hours to up to 2 weeks in species with hearing specializations, depending on factors such as intensity, duration of exposure, and frequency (Popper et al. 2019). Impacts to fishes from pile driving would be minimized through a preference for vibratory pile driving and the use of bubble curtains or similar attenuation systems during impact driving of steel pipe piles, and implementation of a soft-start approach of an impact hammer (Table 3.5-12: BMP BIO MGMT BREM-5 and -6). The soft-start approach would provide fishes several warning pulses that would encourage them to leave the area, minimizing the potential for underwater noise exposure. Fishes may also respond behaviorally to construction noise by temporarily leaving or avoiding the area for the duration of construction activity. Also, during long periods of pile driving, fishes may habituate to the noise over time and either return to the area after a short duration or not leave to begin with. While some individual fishes within the vicinity of pile driving activities may suffer displacement, reduction in prey and forage availability, reduction in fitness, TTS, and to a much lesser degree the potential for internal injuries, and/or mortality as a result of the activities, these impacts would not result in appreciable impact or reduction to the overall population level of a given species.

In-water work would occur during periods when juvenile salmonids are least likely to be present in the project area, which would reduce their exposure to injurious noise levels. With respect to ESA-listed fish,

adult bocaccio rockfish (Puget Sound/Georgia Basin DPS) and juvenile and adult yelloweye rockfish (Puget Sound/Georgia Basin DPS) may be within TTS thresholds as these distances would extend outside of Sinclair Inlet. Juvenile bocaccio rockfish (Puget Sound/Georgia Basin DPS) may be within the shallow habitats during pile driving activities and may also be exposed to TTS and potentially injurious noise thresholds. As discussed above for turbidity impacts to bull trout (Coterminous U.S. DPS), they are expected to be rare within the Demolition, Construction, Operations portion of the ROI. In general, larger ESA-listed juvenile Chinook salmon (Puget Sound ESU), adult life stages of Chinook salmon (Puget Sound ESU), and steelhead (Puget Sound DPS) may be exposed to TTS as the cumulative threshold zones would extend offshore, over deeper water, where these species may be present (see Appendix N).

Using the Practical Spreading Loss Model (see Appendix N), distances to onset of mortality, recoverable injury, and TTS were modeled for the loudest pile types installed for the proposed M2D2 and new piers under Alternative 2. The distances provided below are for cumulative SEL thresholds which involves the cumulative energy of all impact strikes over a 24-hour period, the affected area represents the maximum extent of potential injurious or TTS effects. Earlier in the construction day, these zones (onset of mortality, recoverable injury, and TTS) would be smaller, and only reach the maximum extent after all the pile strikes have been completed. For fishes, the distances to thresholds by loudest pile type and structure are summarized below.

M2D2 Construction – Impact install of 48-inch diameter steel pipe piles:

- Distance to onset of mortality would be up to 115 ft (35 m)
- Distance to recoverable injury would be up to 213 ft (65 m)
- Distance to TTS would be up to 2,070 ft (631 m)

M2D2 Construction – Impact install of steel sheet piles:

- Distance to onset of mortality would be up to 184 ft (56 m)
- Distance to recoverable injury would be up to 338 ft (103 m)
- Distance to TTS would be up to 3,280 ft (1,000 m)

Pier Construction – Impact install of 36-inch diameter steel pipe piles:

- Distance to onset of mortality would be up to 98 ft (30 m)
- Distance to recoverable injury would be up to 184 ft (56 m)
- Distance to TTS would be up to 1,775 ft (541 m)

Distances to mortality or injury (up to 338 ft [103 m]) during impact pile driving would be localized to the waterfront but could potentially expose fish such as forage fish, flatfish (e.g., English sole, flounder), sculpin, perch, and larger salmonid species that have been documented along the waterfront (see Appendix K) to injurious underwater noise. Due to a preference for vibratory pile driving, the use of bubble curtains or similar attenuation systems for impact driving of steel pipe piles, and implementation of the soft-start approach for impact pile driving (BMP BIO MGMT BREM-5 and -6), injury is much less likely to result as fish would be expected to move away from the small zones that surround the pile, and thus exposure to injurious thresholds may be reduced. Exposure to TTS would extend out farther (up to 3,280 ft [1,000 m]) and may impact fish that are occurring within the deeper and offshore waters of Sinclair Inlet (see Appendix K). Exposure to TTS may result in habitat avoidance and decreased sensory capabilities which may also result in reduced fitness for hours to days following exposure (Turnpenny et

al. 1994; Hastings et al. 1996; Hawkins and Popper 2018). The TTS zones would also overlap designated critical habitat for Chinook salmon (Puget Sound ESU) and bocaccio rockfish and yelloweye rockfish (Puget Sound/Georgia Basin DPS) that is present outside of the critical habitat exclusion area. In-water work would be conducted within the allowable in-water work window to minimize impacts to juvenile salmonids (from July 16 – February 15 [USACE 2017]), this work window would also minimize potential impacts to other fish species that occur within the Demolition, Construction, and Operations ROI as in-water work would be prevented from occurring year round and would instead be limited to up to 214 days each year for up to 15 years.

NMFS communicated with the DoD during the rule-making process and determined critical habitat would be designated for Chinook salmon (Puget Sound ESU) within Sinclair Inlet, confined to a narrow nearshore zone within NRA #1 from the line of extreme high tide down to the line of MLLW (per 70 FR 52629). Critical habitat does exist just east of the NRAs for bocaccio and yelloweye rockfish (Puget Sound/Georgia Basin DPS) (per 79 FR 68041). Impacts from turbidity and injurious underwater noise levels are expected to stay predominantly within Sinclair Inlet. However, exposure to TTS from underwater noise may overlap with Chinook salmon (Puget Sound ESU) critical habitat, potentially affecting water quality and quantity conditions along the nearshore marine environment and estuarine areas as well as forage fish (prey availability) occurring outside of the critical habitat exclusion area. Settlement habitats for juvenile bocaccio rockfish (Puget Sound/Georgia Basin DPS) and deepwater habitat with structure and rugosity for feeding opportunities and predator avoidance for yelloweye and bocaccio rockfish (Puget Sound/Georgia Basin DPS) are located within the Demolition, Construction, Operations ROI where exposure to TTS could impact these habitats. The Navy is consulting with NMFS under the ESA for impacts to designated critical habitat for these species.

Other fish species (see Appendix K), including those for which EFH has been designated, may be within the Demolition and Construction ROI during the in-water work window where underwater noise may expose these fish species to injurious and TTS thresholds. Although BMPs such as using a soft-start approach (as described above) and using a bubble curtain would minimize impacts to fish that may be present within the injurious range to effect, not all fish can be expected to avoid the area. Fish species would have reduced access to foraging areas, benthic and vegetation habitat, and underwater noise exposure for the duration of the project (up to 15 years).

Nearshore Barriers/Overwater Shade/Overwater Lighting: Nearshore barriers such as piers, dry docks, cofferdams, and equipment in the water will likely cause habitat avoidance or expose fish to increased predation levels by causing them to go farther offshore to avoid the barrier. Piers, pilings, barges, and vessels can create shade that will impact natural light penetration into the water resulting in localized loss of macroalgae, decreased forage opportunities for fish and a reduction in available fish habitat potentially resulting in increased predation (WDE, 2017). Shade resulting from overwater structures can cause a barrier to salmonid migration resulting in behavioral changes that include milling about near the barrier or going around the barrier into deeper water (Prinslow et al. 1980; Ono et al. 2010). Either of these situations results in increased migration timing, increased energy expenditure, and increased exposure to predation. Although in-water work can only occur for up to 214 days in a construction year, vessel and barge activity would be present year round in various locations of the nearshore waterfront. The cofferdam would be constructed starting in 2028. Prior to install of the outer wall of the cofferdam structure, there is potential of entrainment of fish and marine mammals within the cofferdam structure.

BMPs to use a bubble screen and remove fish and marine mammals prior to dewatering would be implemented (Table 3.5-12: BIO MGMT BREM-18 and -19).

Over 40 vessels varying in size from skiffs and crew boats measuring 200 sq. ft. to as large as barges measuring 30,000 sq. ft. will create additional overwater shade for extended periods during the day and for up to 15 years. This shade will contribute to the potential of increased risk of predation, reduction of habitat, temporary loss of aquatic vegetation, and behavioral changes such as delayed migration.

Artificial lighting on piers, drydocks, and other nearshore structures has the potential to increase predation risk of salmonids, especially at night (Western Fisheries Research Center, 2022; Nelson et al. 2021). Research has shown that even low levels of light can disrupt normal physiology and behavior related to swimming activity, rest, and foraging (Bassi et al. 2021). Nelson et al. (2021) found that the predator density of piscivorous fishes increased resulting in higher predation risk of Chinook salmon smolts 3 to 5 hours after sunset in areas of artificial light. Subyearling Chinook salmon were observed to be attracted to a variety of commonly used light sources that used a wide range of spectra exposing the salmon to increased potential of predation while concentrated in nearshore artificially listed habitats (Tabor et al. 2021). Ways to reduce or minimize artificial lighting impacts may include low intensity LEDs, shortening the periods of light use (motions sensors), and using dimmers (Nelson et al. 2021; Bassi et al. 2021).

Summary of Impacts to Federally Protected Species

Pursuant to the ESA, construction impact stressors (turbidity, underwater/airborne noise, benthic invertebrate and vegetation loss, temporary displacement of forage fish, entrainment, nearshore barriers/overwater shade/overwater lighting [including artificial lighting]) may affect killer whale (Southern Resident DPS), humpback whale (Central America and Mexico DPSs), marbled murrelet, Chinook salmon (Puget Sound ESU), steelhead (Puget Sound DPS), bocaccio rockfish and yelloweye rockfish (Puget Sound/Georgia Basin DPS), sunflower sea star and bull trout (Coterminous U.S. DPS [Coastal Recovery Unit]). The Navy is consulting with USFWS and NMFS for these species, as required by Section 7(a)(2) of the ESA.

Under the MBTA regulations applicable to military readiness activities (50 CFR Part 21), the impacts to the above listed stressors, as described under Alternative 2 would not result in adverse effects on populations of seabirds, shorebirds, and other birds protected under the MBTA.

Under the MMPA regulations, “take” of marine mammals are anticipated due to the acoustic stressors from underwater pile driving noise activities. The Navy is consulting with NMFS and has submitted a request for an LOA to authorize such take for the first five years of construction, and will request additional LOAs in the future for the remaining years of construction.

Under the MSA, EFH would be affected by the above stressors. The Navy is consulting with NMFS through the preparation of an EFH Assessment in combination with a Biological Assessment as required under the ESA.

ESA Species Along Caisson Delivery Transit Route and Open-Water Dredged Disposal Site and Contractor Multi-use Site(s) Routes

Vessel collisions and strikes could involve other Pacific and Atlantic Ocean ESA-listed species (see Appendix I) during two separate vessel trips to deliver the new caissons. These two trips would be months to years apart. As the vessel may be traveling through the Atlantic Ocean and the Caribbean Sea

to cross through the Panama Canal and up the West Coast, additional ESA species may be encountered (see Appendix I).

Cetaceans, pinnipeds, sea turtles and marbled murrelet are particularly at risk for vessel strike as these species may occur offshore and encounter a potential strike from the vessel when they surface to breathe or rest. Vessel strikes/collisions are defined as any impact between any part of a watercraft (most commonly bow or propeller) and a live marine animal (Peel et al. 2018). Carcasses retrieved of fish species such as sturgeon and giant manta rays (*Manta birostris*) have shown evidence of propeller wounds (NMFS 2022b; Schoeman et al. 2020).

The type and severity of injury depends upon the size of the vessel, the speed and direction of the vessel if in motion, the part of the vessel that strikes the animal (i.e., hull vs. propeller), and the part of the body impacted. Depending on these factors, collision with even a small vessel has the potential to cause serious injury or death (Schoeman et al. 2020). Ship strikes are a growing issue for most marine mammals, although mortality may be a more significant concern for species that occupy areas with high levels of vessel traffic, because the likelihood of encounter would be greater (Currie et al. 2017; Rockwood et al. 2017; Van der Hoop et al. 2013, 2015).

The proposed vessel route for caisson deliveries may also overlap with designated critical habitat for humpback whale (Central America and Mexico DPSs), killer whale (Southern Resident DPS), leatherback sea turtle, loggerhead sea turtle (Northwest Atlantic Ocean DPS), bocaccio and yelloweye rockfish (Puget Sound/Georgia Basin DPS), bull trout (Coterminous U.S. DPS), Chinook salmon (Puget Sound ESU), steelhead (Puget Sound DPS), chum salmon (Hood Canal Summer Run ESU), and green sturgeon (Southern DPS). Appendix I provides the federal register citations to reference for descriptions of critical habitat for each of these species. The designated critical habitat physical and biological features (PBFs) for these species includes suitable water quality/quantity and substrate, areas of natural cover and forage, and free passage for migration, resting, and foraging. Vessel transit is not expected to appreciably affect any of these PBFs. Vessel transit may cause some marine mammals or turtles to temporarily change their migration trajectory but would not result in long-term effects on foraging or resting behavior.

Although the vessel trips may affect ESA-listed species encountered along the proposed route, the chance of such an encounter is extremely remote because of the low probability that individual animals of the ESA-listed species would overlap in space and time with these events. The temporary and slow-moving presence of these vessels is not expected to result in an increased likelihood of injury, nor would it significantly disrupt breeding, feeding, or socializing for any ESA-listed species encountered. Species with life stages that are demersal, as well as critical habitat elements that are on or part of the substrate, are not expected to interact with these transiting vessels and are so low as to be discountable. Additionally, the relatively slow speed of the heavy-lift vessels (approximately 10 knots unless in an emergency) further reduces the chance of ship strike with large whales, dolphins, and most marine species. BMPs would be in place to minimize potential strikes to the furthest extent practicable and include the requirement of a maximum speed of 10 knots through areas where North Atlantic right whales may occur and within the waters for Washington State at a speed of 7 knots for Southern Resident killer whales (BMP MGMT BREM-17). The risk of vessel collision from the caisson deliveries may affect ESA-listed species or designated critical habitat; however, impacts are anticipated to be insignificant. The Navy is consulting with USFWS and NMFS, and the elements of the biological opinion would be incorporated in the Final EIS.

Up to 3 barges and 8 smaller vessels of varying sizes would be moving to and from the Open-Water Dredged Disposal Site and Contractor Multi-use Site(s) per day over the 15-year project duration (see Table 2-2). Species that may be encountered along these routes include humpback whale (Central America and Mexico DPSs), killer whale (Southern Resident DPS), bocaccio and yelloweye rockfish (Puget Sound/Georgia Basin DPS), bull trout (Coterminous U.S. DPS), Chinook salmon (Puget Sound ESU), steelhead (Puget Sound DPS), and marbled murrelet. Mariners who operate small to medium size vessels can often feel when the vessel strikes an animal, particularly larger mammals (NMFS 2022b). The disposal barges are anticipated to be a size in which mariners may feel the vessel strike, particularly with larger whales. As described above for the Caisson Delivery Transit Route, if more than one trip per day occurs, these increased vessel movements increase the potential risk of a strike. Observers will look for whales during vessel transit and vessel operators will implement avoidance procedures to prevent vessel strikes (BIO MGMT BREM-17). Although there is the potential for vessel injury to fish, the vessel noise will likely deter them from coming close enough to a vessel to sustain injury.

The proposed Open-Water Dredged Disposal Site and Contractor Multi-Use Site(s) Routes intersects designated critical habitat for killer whale (Southern Resident DPS), bocaccio rockfish and yelloweye rockfish (Puget Sound/Georgia Basin DPS), bull trout (Coterminous U.S. DPS), Chinook salmon (Puget Sound ESU), and steelhead (Puget Sound DPS). Appendix I provides the Federal Register citations to reference for descriptions of critical habitat for each of these species. The designated critical habitat PBFs for these species includes suitable water quality/quantity and substrate, areas of natural cover and forage, and free passage for migration, resting, and foraging. Vessel transit is not expected to appreciably affect any of these PBFs. If encountered along the Open-Water Dredged Disposal Site and Multi-Use Contractor Site(s) Routes, vessel transit could cause killer whales (Southern Resident DPS) to temporarily change their foraging and resting behavior but would not result in long-term effects. Therefore, barging suitable dredged material from Sinclair Inlet to the permitted, open-water Elliott Bay Disposal Site and materials not suitable for open water disposal and transported to Port of Seattle and/or Port of Tacoma may affect ESA-listed species and their critical habitat but would not be significant. As discussed above for the Caisson Delivery Transit Route, the Navy is consulting with USFWS and NMFS and the elements of the biological opinion would be incorporated in the Final EIS.

Operation-related Impacts

Alternative 2 would include the use of a newly constructed saltwater cooling and distribution system for M2D2. When compared to current operations, the system for M2D2 will also comply with PSNS & IMF NPDES permitting requirements for saltwater cooling effluent discharges at the existing Shipyard Outfall 18 and the new outfall.

Marine Mammals

The Proposed Action Alternatives are not expected to increase the number of ships using PSNS & IMF facilities.

Dry dock operations include flooding, caisson removal, caisson replacement, and dewatering. Caissons are removable watertight walls within each dry dock. They are removed to allow for ship ingress and egress. Dewatering is accomplished with the use of pumps that move large volumes of water efficiently. During ingress and egress operations of the current and proposed new dry dock facilities, air curtains (bubble screens) (Table 3.5-12: BMP BIO MGMT BREM-14) are activated across the southern entrance into the dry docks to deter fish from entering the structure (NMFS 2011, 2021) which in turn minimizes

the incentive for pinnipeds seeking entry. Air curtains are shut off when vessels are crossing over the curtain to prevent induction of air bubbles into the vessel's cooling water intakes. To date, pinnipeds have never become trapped in Bremerton dry docks and docking office personnel monitor for marine mammals during the ingress and egress activities (Stone, Richard pers. comm. 2022).

NMFS has previously concurred that existing operations at PSNS & IMF is *not likely to adversely affect* humpback and Southern Resident killer whale because: (1) both historical and current occurrence of humpback and Southern Resident killer whales near PSNS & IMF are low (NMFS Tracking Number: WCR-2009-06414); therefore, their presence would be rare within the Demolition, Construction, Operations portion of the ROI; and (2) decreases in forage fish or Chinook salmon would occur locally and the effects would be short-term and intermittent, and would be insignificant (NMFS Tracking Number: WCR-2009-06414). Future operational effects to these species are expected to be the same as status quo, and the Navy is consulting with NMFS for future operations of new and upgraded facilities by requesting concurrence for a determination of *not likely to adversely affect* humpback and Southern Resident killer whale.

Birds

Operations of the new M2D2 drydock facilities are not expected to cause an increase in vessel traffic or increase human presence. Operational noise levels at PSNS & IMF are expected to be similar to baseline conditions, since the facility's mission would be fundamentally the same. PSNS waterfront is a heavily industrialized area that uses artificial lighting at night. It is anticipated that there would be additional lighting needed and positioned farther offshore during operations due to the size of M2D2. Although there would be subtle changes in noise, night lighting, and human presence associated with operations, these changes would not have an appreciable effect on birds in the vicinity of PSNS & IMF.

As is the case with existing operations at PSNS & IMF (i.e., effects would be the same as status quo), the Navy is consulting with USFWS for future operations of new and upgraded facilities and are requesting a determination of *not likely to adversely affect* marbled murrelet because: (1) The portion of Sinclair Inlet that would be affected is within the Operations ROI (within the PSB/NRA#2); (2) Annual WDFW surveys have detected marbled murrelet in the deeper offshore waters and in low numbers outside Sinclair Inlet. Marbled murrelets have not been recorded within the Operations ROI or Sinclair Inlet in general during multiple historical surveys and recent surveys at PSNS & IMF; (3) Increased turbidity would be short-term and localized and would not result in a violation of water quality standards. Therefore, impacts to marbled murrelets due to dry dock operations would be insignificant as there would be only a short-term and localized reduction in the available prey base within the Operations ROI (Navy 2022).

Marine Vegetation and Marine Invertebrates

In areas of increased overwater coverage compared to baseline conditions, overwater shading would potentially result in a permanent loss or reduction of marine vegetation by affecting primary productivity (Nightingale and Simenstad 2001). Shading impacts would be localized and limited to marine vegetation in the waterfront area. Areas of new permanent overwater shading would include the footprint of new overwater structures. Under Alternative 2, the extent of long-term loss of marine vegetation as a result of new overwater shading (net increase in overwater coverage) would be up to 1 acre. Figure 3.5-14 shows overlap of new construction with marine vegetation. No federal or state-protected species of marine vegetation would be affected.

The Proposed Action is not expected to increase the number of ships using PSNS & IMF facilities. Over the long-term, flooding and dewatering of the dry dock operations could result in inadvertent entrainment of invertebrates that are present in the water column (e.g., California market squid [*Loligo opalescens*] and various types of shrimp). The dry docks at PSNS & IMF are known to trap invertebrates, predominantly crabs and sea stars (Pacunski et al. 2022). During docking and undocking events, there would be temporary and sporadic increases in turbidity, which could impact invertebrates in the immediate area of the dry docks by covering sessile organisms and temporarily impacting water quality as described previously under Demolition and Construction-Related Impacts. However, these impacts would be short-term and localized to within NRA #2. As discussed in Section 3.3, *Water Resources*, dry dock operations would have the potential to impact water quality through discharges of stormwater, groundwater, process water, and saltwater cooling effluent to Sinclair Inlet. The new cooling water outfall and diffuser would be located and configured to address potential localized impacts to ambient water quality. These discharges would comply with PSNS &IMF Industrial Discharge Permit requirements which would reduce the risks of impacts to marine invertebrates. There would be improved habitat for pelagic species such as market squid from removal of contaminated sediment and improved cooling water intake structure. However, there is still the potential of entrainment of fishes in the intake structure.

Fishes

New Nearshore Barriers/Overwater Structures/Overwater Lighting: The new piers would be an increase in overwater structures, the new dry docks would be an increase in nearshore barriers and both new structures will have overwater lighting at night that will result in impacts to salmonid migration in terms of delayed timing, increased energy expenditure, and increased risk to predation. As discussed above, shade resulting from overwater structures can cause a barrier to salmonid migration (Prinslow et al. 1980; Ono et al. 2010). New artificial lighting on piers, drydocks, and other nearshore structures may create increased predation risk, disrupt normal physiology and behavior, and also delay migration (Western Fisheries Research Center, 2022; Nelson et al. 2021; Bassi et al. 2021).

Dry Dock Egress/Ingress Operations: Entrainment studies conducted at the existing drydocks have concluded that the potential for long-term adverse impacts from entrainment of fishes during flooding and dewatering of dry dock operations is small (Pacunski et al. 2022). Entrainment is the voluntary or involuntary movement of fish from the parent water body into a surface diversion, a human-made structure or installation for diverting water. All PSNS & IMF dry docks open to the south at their respective quay walls, which define the location of the shoreline. Juvenile salmonids are known to migrate along this shoreline toward the open ocean (SAIC 2000; Fresh et al. 2006). The dry docks at PSNS & IMF are known to entrain salmonids, forage fish, finfish, and groundfish during flooding and when the caissons are removed (Pacunski et al. 2022). Current and future dry dock operations use bubble screens (Table 3.5-12: BIO MGMT BREM-14) which are systems that produce bubbles in a deliberate arrangement in the water and act as a partial barrier and deterrent in an attempt to reduce the movement of fish into the dry dock and thus reduce the potential for fish to become entrained during drydock Egress and Ingress. The new cooling water outfall and diffuser would discharge cooling water into Sinclair Inlet, which could result in localized impacts to fish species due to increased water temperature in the vicinity of the outfall.

Cooling Water Intake Structure Operations: There is also the potential for entrainment of fishes within the cooling water intake structures. The new M2D2 would be equipped with a saltwater cooling and distribution system (see Chapter 2) that would reduce the potential for entrainment. The cooling water

intake structures would comply with the requirements of 40 CFR 125 for minimizing marine species entrainment and impingement (Table 3.5-12: BMP BIO MGMT BREM-20).

The regulation for the cooling water intake structure defines an existing facility in 40 CFR 125.92(k) as "any facility that commenced construction as described in 40 CFR 122.29(b)(4) on or before January 17, 2002 or July 17, 2006 for an offshore oil and gas extraction facility) and any modification of, or any addition of a unit as such a facility." Based on this definition, all of PSNS & IMF is an existing facility as all dry docks predate January 17, 2002. To be compliant with the rule, existing facilities must meet the Best Technology Available (BTA) Standards for impingement mortality of aquatic biota, which are found in 40 CFR 125.94. The saltwater cooling system for M2D2 would meet BTA standards for new units at existing facilities. The Navy will follow the requirements in the Biological Opinion and NMFS Fish Passage Design Manual (published in 2022, addendum in 2023).

The Navy will consult with NMFS and USFWS on the impacts of dry dock operations to ESA-listed salmonids. Information from the biological opinion would be included in the Final EIS.

Summary of Impacts from Operations

Impacts from operations of the new M2D2 would include (1) temporary and sporadic increases in turbidity during egress and ingress procedures, which are expected to be localized to the immediate area of the dry docks (within the Operations ROI [PSB]); (2) create a short-term and localized decrease in available prey due to entrainment of forage fish; and (3) entrainment of fish species (see Appendix K) in the dry dock structures; (4) new overwater structures would create shading, barriers; (5) localized impacts to fish species due to a new cooling water outfall and diffuser; and (6) artificial lighting that can delay salmonid migration, increase predation risk, and reduce fitness. Operations of M2D2 is not expected to differ in procedure and number of events from what is currently conducted annually at PSNS & IMF. Operations may affect ESA-listed fish (Chinook salmon [Puget Sound ESU], steelhead [Puget Sound DPS], bocaccio rockfish and yelloweye rockfish [Puget Sound/Georgia Basin DPS], and bull trout [Coterminous U.S. DPS, Coastal Recovery Unit]). The Navy is consulting with USFWS and NMFS and elements of the biological opinion would be incorporated into the Final EIS. Current BMPs which include regular cleaning and inspections of vessels and dry docks, use of bubble screens to minimize potential for entrainment, and monitoring for and collection of adult salmonids and returning them to Sinclair Inlet would continue to be implemented during operations (BMP BIO MGMT BREM-13,-14, and -15).

Effects Associated with Reasonably Foreseeable Future Actions

RFFAs are not expected to interact with project-related effects from habitat removal (permanent, localized), suspended sediment (short-term [hours to days], localized) or construction noise associated with the Proposed Action in a manner that is additive. The BMPs summarized above and described in Table 3.5-13 would simultaneously increase installation resilience and reduce long-term adverse impacts to local biological resources.

NAVBASE Kitsap-Bangor

Alternative 2 would include upland clearing to create a permanent laydown area which would remove vegetation that functions as habitat and create a level of construction noise that may cause wildlife species to avoid the area and/or abandon nests.

Construction-related Impacts

The main disturbances to wildlife from implementation of Alternative 2 include noise associated with the proposed construction activity and potential removal of habitat through vegetation management/ clearing. Noise levels generated above 60 dBA can provoke changes in behavior of wildlife.. Behavior changes can range from habitat avoidance to impaired detection of sounds from predators, prey, or communication signals between species (Dooling and Popper 2007). However, wildlife are likely acclimated to the baseline noise levels (~60 to 80 dBA) that occur at NAVBASE Kitsap-Bangor (Navy 2020a). Construction activity would occur during daylight hours and is expected to last approximately 3 years. Wildlife species would likely avoid the area during construction and some species may return to the area from dusk until dawn or may permanently avoid the area and seek out other available habitat adjacent to Alternative 2 Proposed Action locations.

Under Alternative 2, a new forge shop, parking area, accompanying roadwork, and expansion of Radio Hill complex would require removal of existing vegetation at NAVBASE Kitsap-Bangor. Removal of trees would potentially destroy nesting habitat for birds as well as foraging and resting habitat for amphibians and mammals, but wildlife have the opportunity to seek out other suitable habitat in the surrounding area. In comparison to overall forest habitat that is available adjacent to the Alternative 2 Proposed ROI and within NAVBASE Kitsap-Bangor in general, the removal of these trees would not be significant to terrestrial species if conducted outside of the bird nesting season. However, as found in a 2023 habitat survey (Navy 2023a), suitable marbled murrelet habitat was identified within the ROI, so this species may be affected by the Proposed Action. The Navy is currently consulting with USFWS under the ESA.

Bald eagles may be present resting within the nearby forest stands for brief periods in between flight to foraging or nesting sites located a significant distance away from the Proposed Action location. One bald eagle nest has been recorded approximately 2.9 miles from the ROI (Navy 2018). Bald eagles would likely avoid the area during construction and are not likely to be significantly impacted with implementation of Alternative 2.

Operations-related Impacts

The new forge shop and Radio Hill complex expansion area will create a change in ambient airborne sound conditions at the proposed site from a more vegetated/rural environment to a more industrial noise environment. Current UFCs (UFC 3-101-01 [Architecture] and UFC 3-450.01 [Noise and Vibration Control]) require noise control and sound isolation for mechanical rooms adjacent to occupied spaces. The Navy would treat the outside space as an occupied space and design the new forge shop to not exceed approximately 60 dB on the exterior of the facility. Therefore, operation of the new forge shop is not anticipated to increase existing ambient sound levels. There could still be long-term impacts to species from visual disturbance and masking of calls due to the increase in some operations noise and associated activities in areas of the ROI through increased human, vehicle/truck, and equipment used and the reduction of vegetation that would typically attenuate noise transmission. This would potentially result in a change in wildlife that occur in the area but would be localized to the NAVBASE Kitsap-Bangor forge shop and Radio Hill complex expansion area of the ROI. Over time, wildlife species may permanently leave the area and seek out other vegetation/rural locations on the installation or acclimate to the new ambient sound levels.

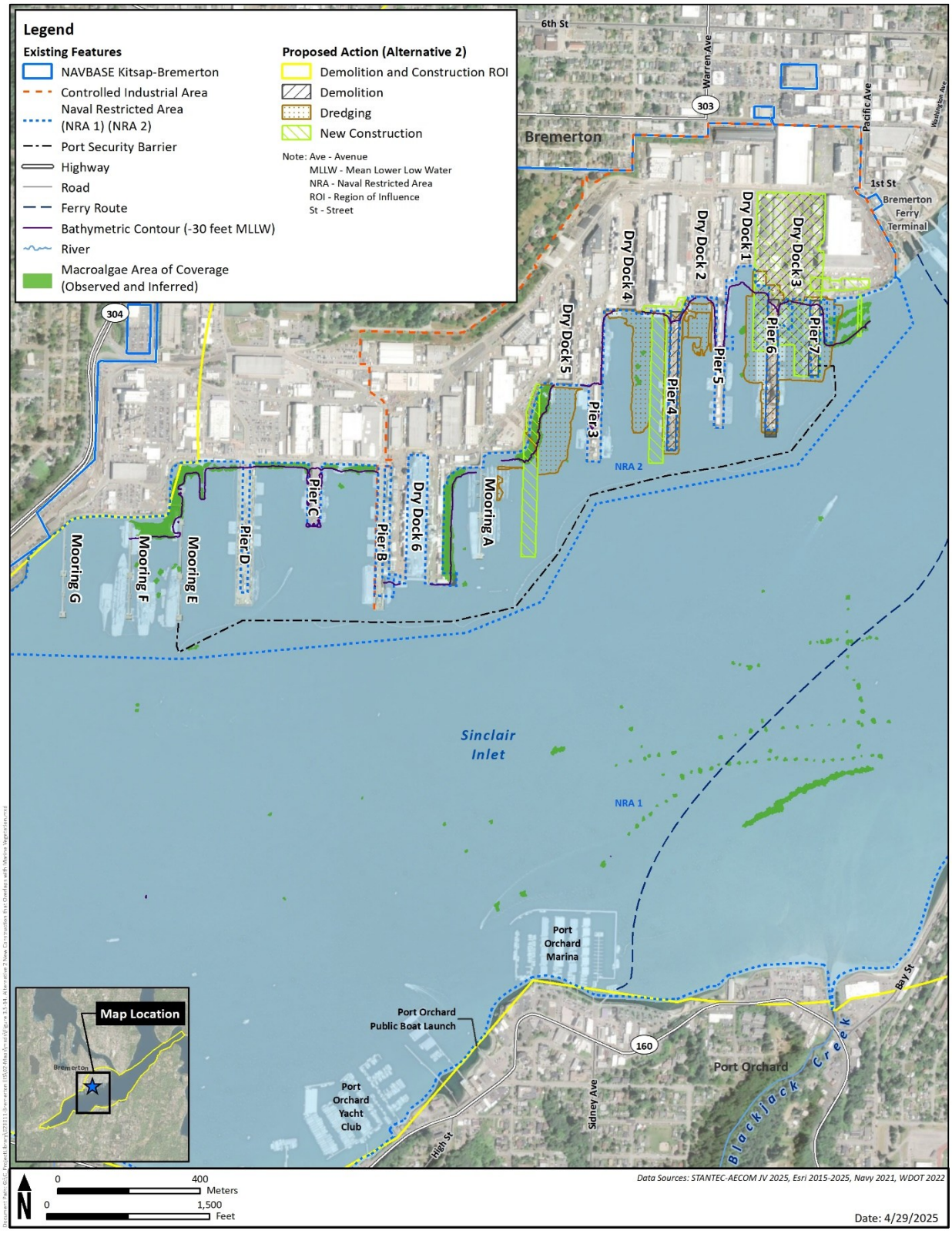

Figure 3.5-14 Alternative 2: New Construction that Overlaps with Marine Vegetation

Effects Associated with Reasonably Foreseeable Future Actions

When combined with RFFAs, there would be additive impacts to biological resources within the ROI.

3.5.3.5 Impact Analysis for Alternative 3

The following discussion analyzes impacts specific to Alternative 3 during construction and operations.

NAVBASE Kitsap-Bremerton

As discussed under Alternative 2, a temporary barge-mounted saltwater intake and pump system would be used while the new saltwater cooling and distribution system is being constructed, and up to 18 temporary mooring buoys would be installed nearby (to be determined). Impacts to biological resources would be the same as described under Alternative 2.

Demolition and Construction-related Impacts

Under Alternative 3, in-water work would begin in 2027 and conclude in 2041 (see Table 2-7 Construction Sequencing). A maximum of up to 3,303 concrete and steel pipe piles and 1,665 linear feet of steel sheet piles would be permanently installed. A total of 796 existing piles would be removed during demolition of piers and wharves with up to 27 of the total piles removed consisting of creosote-treated timber piles.

Construction-related impacts to marine biological species resulting from: exposure to chemical contaminants, waste, and pollutants; vessel strikes, entrainment or other direct interactions with construction activities; availability of haul-out sites; and displacement of prey species would be the same as described for Alternative 2 in Section 3.5.3.4, with the following differences listed below

Alternative 3 would:

- require more dredging but less pile installation when compared to Alternative 2;
- produce approximately twice the amount of dredge material as Alternative 2;
- create additional nearshore barriers, shade, artificial lighting, in-water acoustics, turbidity in the water column on the western side of the installation during pile driving activities to upgrade moorings E, F, and G.

Marine Mammals

As detailed in Table 3.5-2, There are 15 species and distinct population segments of marine mammals that may be present in the vicinity of NAVBASE Kitsap-Bremerton during Project demolition and construction, including three ESA-listed marine mammals. Project impacts to marine mammals could result from activities such as dredging, marine demolition, pile driving/extraction activities, and increased vessel traffic during construction. The Navy has initiated section 7 consultation with NMFS on ESA-listed marine mammal species and has prepared a request to NMFS for an LOA for incidental take of marine mammals as required under the MMPA.

Potential acoustic impacts to marine mammals would occur from exposure to elevated noise levels during pile installation and removal for both alternatives over the same project duration of 15 years.

Using the thresholds and methods described in Appendix N, model distances to noise above NMFS thresholds for AUD INJ and behavioral harassment have been generated for Alternative 3 and are presented in Table 3.5-20 and Table 3.5-21. As was done for Alternative 2, the number of marine mammals that may be potentially exposed to underwater noise above NMFS established thresholds was

developed, as presented in Appendix N. For species that regularly occur in the Demolition, Construction, Operations portion of the ROI, Alternative 3 would result in potentially less exposures than Alternative 2, since Alternative 3 involves the installation and removal of less piles than Alternative 2. For species that rarely occur in the Demolition and Construction ROI, there is no predictable difference in the potential exposure rates between Alternative 2 and Alternative 3.

Like under Alternative 2, potential impacts from pile driving would be minimized through preferential use of vibratory driving, the use of bubble curtains or similar attenuation system during impact driving of steel pipe piles, soft-start pile driving procedures, and monitoring with the implementation of shutdown zones (Table 3.5-12: BMP BIO MGMT BREM-5, -6, and -7, respectively). Injury to most marine mammal species (i.e., Level A harassment), including all ESA- listed marine mammal species, would be avoided through the implementation of shutdown zones (Table 3.5-12: BMP BIO MGMT BREM-7). Marine mammal monitors would ensure that pile driving halts whenever a marine mammal is entering or about to enter the applicable shutdown zone and that activities would not resume until that animal has left the zone or has not been sighted for 15 minutes.

A request for take of a small number of Level A exposures may be authorized by NMFS for species that regularly occur in Sinclair Inlet and are habituated to Navy operations there (such as harbor seals and California sea lions). Potential acoustic effects on marine mammals from exposure to elevated noise levels during pile installation and removal may occur but would be intermittent and limited to short-term behavioral changes, as further detailed in Appendix N. Potential effects to marine mammals would be avoided or minimized due to the prudent implementation of BMPs (Table 3.5-12).

For those marine mammal species that regularly occur in the Demolition, Construction, Operations portion of the ROI, an estimate of the potential exposures to underwater noise was developed using at-sea densities developed by the Navy (Navy 2019; Navy 2020c) and pinniped monitoring conducted at NAVBASE Kitsap-Bremerton (Navy 2025), as presented in Appendix N. This estimate represents a reasonably conservative estimate based on the best available data, and likely overestimates the actual number of exposures that may occur.

As shown in Tables 3.5-19 and 3.5-20 below, the largest pile type driven would be a 96-inch steel pipe. It is important to note that distances, particularly for vibratory installation, can appear very large. As discussed in Appendix N and under Alternative 2, the degree to which underwater noise propagates away from a noise source is dependent on a variety of factors (bathymetry, reflective/absorptive conditions, land masses, and anthropogenic structures), so modeled distances may not actually be attained and are expected to overestimate the actual distance to expected sound levels. For example, due to the shape of Sinclair Inlet and the adjoining waters, the furthest distance that pile driving sound could transmit is approximately 5.5 miles (8.9 km), which is much smaller than some of the modeled distances for vibratory pile driving. As explained under Alternative 2, Table 3.5-19 and Table 3.5-20 provide a summary-level look at distances modeled to AUD INJ and behavioral harassment thresholds based on the maximum piles strikes per day and vibratory installation/extraction minutes per day. The details provided in Appendix N would be used for ESA consultation and preparation of an LOA permit application as required for the Proposed Action under the MMPA should Alternative 3 be chosen as the preferred alternative.

As with Alternative 2, implementation of WATER MGMT BREM and BIO MGMT BREM BMPs would minimize impacts to marine mammals.

Birds

As discussed under Alternative 2, increased human activity during construction and demolition as well as airborne noise associated with the project may result in birds avoiding existing or nearby habitat used for roosting, aborting feeding attempts, avoiding foraging habitats over one or multiple days, and masking calls. Pursuit-diving birds such as cormorants, murres, and pigeon guillemots may be affected through masking of calls while on the water and potential injurious effects while underwater. As shown in Table 3.5-16, the largest pile type installed under Alternative 3 would be a 96-inch steel pipe for M2D2 construction. Impacts of installing of a 96-inch steel pipe pile would create a zone of up to 1,154 feet (352 meters) around the pile for which marbled murrelets and potentially other pursuit-diving birds foraging underwater and present within this zone could be exposed to auditory injury (202 dB SEL_{cum} threshold) (Table 3.5-16). During pier and mooring dolphin construction, the largest pile type would be steel sheet piles and 30-inch diameter steel pipe, respectively. See Appendix N for calculated distances to all pile types used.

Airborne noise from impact pile driving steel piles less than or equal to a 36-inch diameter is expected to compromise communication between foraging murrelets at a distance of 138 feet (42 meters) and for piles larger than 36-inch diameter, the distance would be 551 feet (168 meters) (Table 3.5-16).

To avoid impacts to marbled murrelets, monitoring of injury and behavioral disturbance zones around in-water pile driving locations would be implemented (BMP BIO MGMT BREM-7). Pile driving will cease whenever a marbled murrelet enters a shutdown zone, as defined in the marbled murrelet monitoring plans. Plans would be developed and implemented in consultation with USFWS. These protection measures may also benefit other pursuit-diving birds and other marine bird species as well. See Appendix N for a full analysis of noise impacts to marbled murrelet. All other construction-related impacts discussed under Alternative 2 would be the same. Implementation of WATER MGMT BREM and BIO MGMT BREM BMPs would minimize the impacts to marbled murrelet as well as other marine bird species.

Table 3.5-19 Alternative 3: Calculated Maximum Distances to AUD INJ and Behavioral Harassment Marine Mammal Thresholds During Impact Pile Driving

Pile Type	Pile Size (in)	Level B Isopleth [1,2]	Level B ZOI [1,2]	Level A Isopleth							
		All Hearing Groups	All Hearing Groups	Low-Frequency Cetaceans				High-Frequency Cetaceans	Very High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
Concrete	18	151 ft (46 m)	0.003 sq mi (0.007 sq km)	289 ft (88 m)				37 ft (11 m)	446 ft (136 m)	256 ft (78 m)	96 ft (29 m)
Concrete	24	518 ft (158 m)	0.009 sq mi (0.023 sq km)	845 ft (258 m)				108 ft (33 m)	1,307 ft (398 m)	751 ft (229 m)	280 ft (85 m)
Steel	24	384 ft (117 m)	0.100 sq mi (0.253 sq km)	725 ft (221 m)	92 ft (28 m)	1,122 ft (3,42 m)	643 ft (196 m)	240ft (73 m)			
Steel	30	2,070 ft (631 m)	0.230 sq mi (0.602 sq km)	5,334 ft (1,626 m)				680 ft (207 m)	8,248 ft (2,514 m)	4,739 ft (1,444 m)	1,766 ft (538 m)
Steel	36	1,522 ft (464 m)	0.220 sq mi (0.559 sq km)	3,924 ft (1,196 m)				500 ft (152 m)	6,068 ft (1,849 m)	3,486 ft (1,063 m)	1,299 ft (396 m)
Steel	48	961 ft (293 m)	0.093 sq mi (0.241 sq km)	1,340 ft (408 m)		171 ft (52 m)	2,072 ft (631 m)	1,190 ft (363 m)	444 ft (135 m)		
Steel	96	9,610 ft (2,929 m)	3.538 sq mi (9.163 sq km)	21,233 ft (6,472 m)		2,706 ft (825 m)	32,836 ft (10,008 m)	18,866 ft (5,750 m)	7,031 ft (2,143 m)		
Steel Sheet	20 or 24	3,281 ft (1,000 m)	0.69 sq mi (1.800 sq km)	7,250 ft (2,210 m)		924 ft (282 m)	11,212 ft (3,417 m)	6,442 ft (1963 m)	2,401 ft (732 m)		

Notes: See Appendix N for methods used to develop these distances. Sound level source: Navy 2022. [1]-Distances to the 160 dB RMS Threshold for impact pile driving.
Legend: ft = feet; in = inches; m = meters; sq km = square kilometers; ZOI = Zone of influence

Table 3.5-20 Alternative 3: Calculated Maximum Distances to AUD INJ and Behavioral Harassment Marine Mammal Thresholds During Vibratory Installation/Extraction

Pile Driving Method	*Pile Type*	*Pile Size (in)*	*Level B Isopleth [1,2]*	*Level B ZOI [1,2]*	*Level A Isopleth*							
			All Hearing Groups	*All Hearing Groups*	*Low-Frequency Cetaceans*				*High-Frequency Cetaceans*	*Very High-Frequency Cetaceans*	*Phocid Pinnipeds*	*Otariid Pinnipeds*
Vibratory	Steel Sheet	24	60,623 ft (18,478 m)	5.773 sq mi (14.953 sq km)	221 ft (67 m)				85 ft (26 m)	181 ft (55 m)	285 ft (87 m)	96 ft (29 m)
Vibratory	Steel	24	28,140 ft (8,577 m)	5.773 sq mi (14.951 sq km)	121 ft (37 m)				10 ft (3 m)	177 ft (54 m)	72 ft (22 m)	7 ft (2 m)
Vibratory	Steel	30	70,682 ft (21,544 m)	5.773 sq mi (14.951 sq km)	409 ft (125 m)	157 ft (48 m)	334 ft (102 m)	526 ft (160 m)	177 ft (54 m)			
Vibratory	Steel	36	96,083 ft (29,286 m)	5.773 sq mi (14.951 sq km)	556 ft (169 m)				213 ft (65 m)	454 ft (138 m)	715 ft (218 m)	241 ft (73 m)
Vibratory	Steel	48	519,977 ft (158,489 m)	5.773 sq mi (14.951 sq km)	1627 ft (496 m)	625 ft (191 m)	1,329 ft (405 m)	2093 ft (638 m)	705 ft (215 m)			
Vibratory	Steel	96	519,977 ft (158,489 m)	5.773 sq mi (14.951 sq km)	3,007 ft (916 m)				1,156 ft (352 m)	2,455 ft (748 m)	3,868 ft (1,179 m)	1,302 ft (397 m)
Vibratory Removal	Steel	12 to 24	28,140 ft (8,577 m)	5.773 sq mi	124 ft (38 m)				48 ft (15 m)	101 ft (31 m)	160 ft (49 m)	54 ft (16 m)

Pile Driving Method	*Pile Type*	*Pile Size (in)*	*Level B Isopleth [1,2]*	*Level B ZOI [1,2]*	*Level A Isopleth*				
			All Hearing Groups	*All Hearing Groups*	*Low-Frequency Cetaceans*	*High-Frequency Cetaceans*	*Very High-Frequency Cetaceans*	*Phocid Pinnipeds*	*Otariid Pinnipeds*
				(14.951 sq km)					
Vibratory Removal	Timber	16	28,140 ft (8,577 m)	5.773 sq mi (14.951 sq km)	124 ft (38 m)	48 ft (15 m)	101 ft (31 m)	160 ft (49 m)	54 ft (16 m)
Vibratory Removal	Concrete	16 to 24	28,140 ft (8,577 m)	5.773 sq mi (14.951 sq km)	124 ft (38 m)	48 ft (15 m)	101 ft (31 m)	160 ft (49 m)	54 ft (16 m)
Vibratory Removal	Steel Sheet	various	5,200 ft (1,585 m)	1.892 sq mi (4.901 sq km)	23 ft (7 m)	9 ft (3 m)	19 ft (6 m)	30 ft (9 m)	10 ft (3 m)

Notes: See Appendix N for methods used to develop these distances. Sound level source: Navy 2022.
1-Distances to the 120 dB RMS Threshold for vibratory installation/extraction, assuming piles are being installed/removed concurrently.

Legend: ft = feet; in = inches; m = meters; sq km = square kilometers; ZOI = Zone of influence

Marine Vegetation and Marine Invertebrates

Types of impacts to marine vegetation and invertebrates would be the similar as those under Alternative 2. As shown in Table 3.5-17, impacts to marine vegetation as a result of construction would occur over a slightly larger area (up to 1.5 acres of marine vegetation impacts due to dredging plus additional potential impacts over a portion of the 19.6 acres of permanent fill) under Alternative 3. As shown in Table 3.5-18, the total area of marine invertebrate habitat impacted by construction would be greater (89 acres; adding the areas of dredging and fill) under Alternative 3. Additional impacts may occur over a larger area through settling of sediment that are disturbed during dredging (See Appendix H). Dredging would result in the loss of marine vegetation over a larger area (1.5 acres) (Figure 3.5-15 and 3.5-16) than under Alternative 2. Intermittent effects to water quality would also occur over a longer duration but with most water quality disturbance occurring within the allowable in-water work window (up to 214 days in a year). Fewer piles would be installed under Alternative 3 and a similar number of creosote-treated timber piles (27) would be removed during demolition under this alternative. The beneficial impact to vegetation and invertebrates from removal of contaminated sediment during dredging and removal of creosote-treated timber piles during demolition would be slightly less than under Alternative 2. Similar to Alternative 2, the Navy would implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under Section 404 of the Clean Water Act.

Fishes

Impacts to fish under Alternative 3 from dredging and fill and the resulting turbidity would be greater under Alternative 3, as compared to Alternative 2. However, Alternative 3 would result in less pile removal and installation, and therefore the resulting turbidity from those actions would be less. The summary below and detailed discussion on the physiological responses of fish is focused on impact pile driving and is presented in more detail in Appendix N.

Using the Practical Spreading Loss Model (see Appendix N), distances to onset of mortality, recoverable injury, and TTS were modeled for the loudest pile types installed for the proposed M2D2, new piers, and mooring dolphin upgrades under Alternative 3. Distances to cumulative SEL thresholds are provided below and involve the cumulative energy of all impact strikes over a 24-hour period, the affected area represents the maximum extent of potential injurious or TTS effects. As discussed under Alternative 2, earlier in the construction day, these zones (onset of mortality, recoverable injury, and TTS) would be smaller, and only reach the maximum extent after all the pile strikes have been completed. For fishes, the distances to thresholds by loudest pile type and structure are summarized below for Alternative 3.

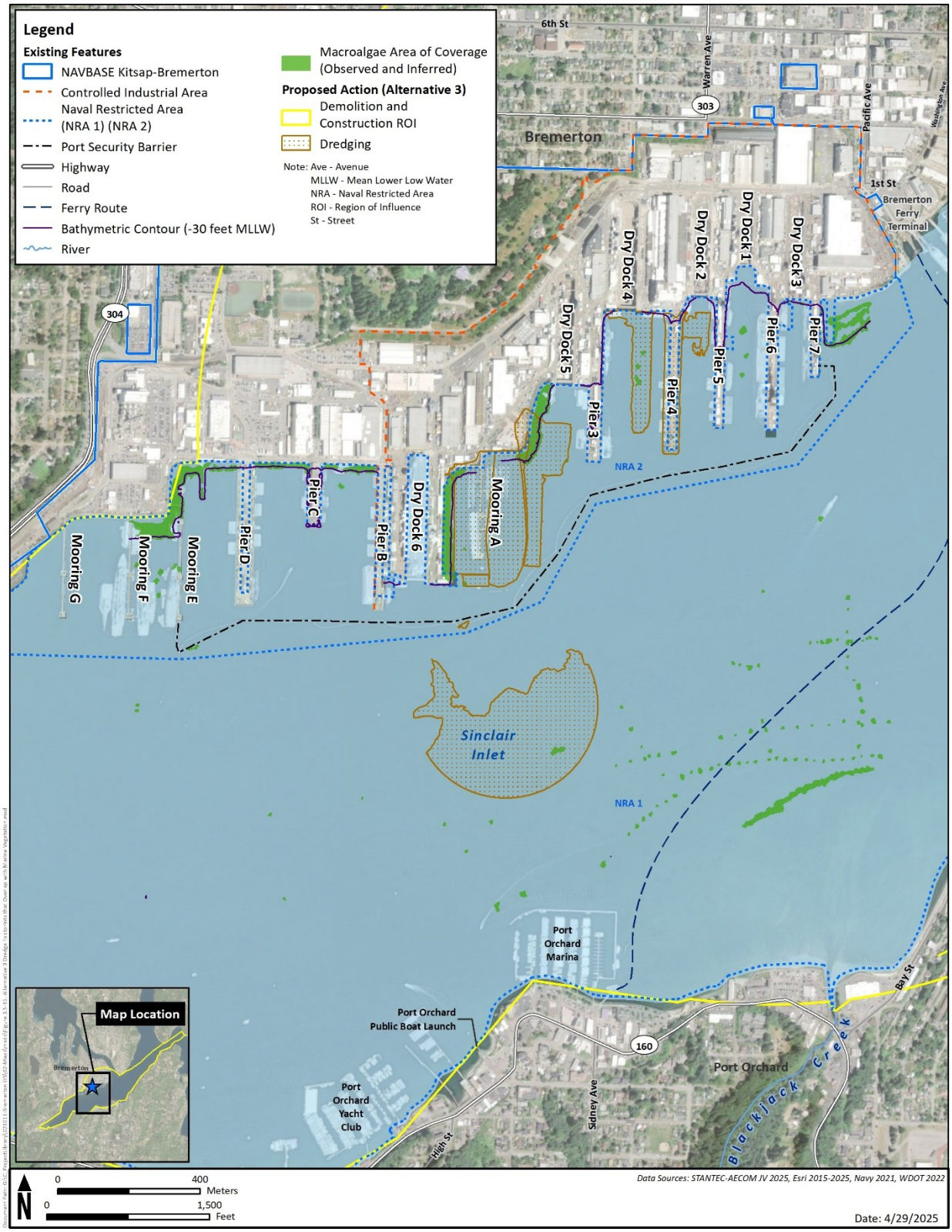

Figure 3.5-15 Alternative 3: Dredged Footprints that Overlap with Marine Vegetation

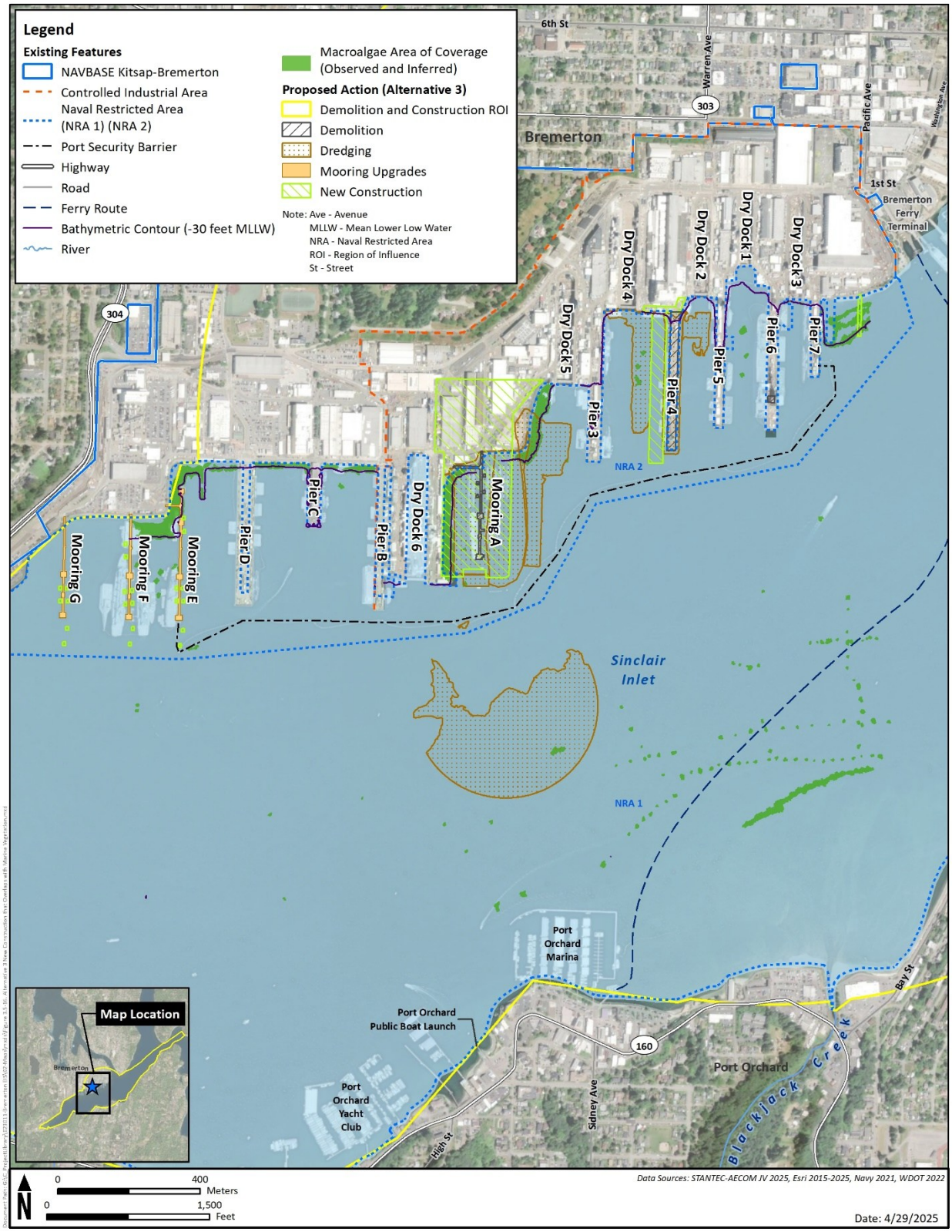

Figure 3.5-16 Alternative 3: New Construction that Overlaps with Marine Vegetation

M2D2 Construction – Impact install of 96-inch diameter steel pipe piles:

- Distance to onset of mortality would be up to 534 ft (163 m)
- Distance to recoverable injury would be up to 991 ft (302 m)
- Distance to TTS would be up to 9,610 ft (2,929 m)

M2D2 Construction – Impact install of Steel Sheet piles:

- Distance to onset of mortality would be up to 184 ft (56 m)
- Distance to recoverable injury would be up to 338 ft (103 m)
- Distance to TTS would be up to 3,280 ft (1,000 m)

Pier Construction – Impact install of 36-inch diameter steel pipe piles:

- Distance to onset of mortality would be up to 98 ft (30 m)
- Distance to recoverable injury would be up to 184 ft (56 m)
- Distance to TTS would be up to 1,775 ft (541 m)

Mooring Modifications – Impact install of 30-inch diameter steel pipe piles:

- Distance to onset of mortality would be up to 52 ft (16 m)
- Distance to recoverable injury would be up to 98 ft (30 m)
- Distance to TTS would be up to 961 ft (293 m)

Distances to mortality or injury (up to 991 ft [302 m]) during impact pile driving would be localized to the waterfront but could potentially expose fish such as forage fish, flatfish (e.g., English sole, flounder), sculpin, perch, and larger salmonid species that have been documented along the waterfront (see Appendix K) to injurious underwater noise. Due to a preference for vibratory pile driving, the use of bubble curtains or a similar attenuation system during impact driving of steel pipe piles, and implementation of the soft-start approach for impact pile driving (BMP BIO MGMT BREM-5 and 6) injury is much less likely to result as fish would move away from the zones that surround the pile and thus exposure to injurious thresholds are expected to be low. Exposure to TTS would extend out farther (up to 9,610 ft [2,929 m]) and may impact fish that are occurring within the deeper and offshore waters of Sinclair Inlet (see Appendix K). Exposure to TTS may result in habitat avoidance and decreased sensory capabilities which may also result in reduced fitness for hours to days following exposure (Turnpenny et al. 1994; Hastings et al. 1996; Hawkins and Popper 2018). The TTS zones are also larger under Alternative 3 and would overlap designated critical habitat for Chinook salmon (Puget Sound ESU) and bocaccio rockfish and yelloweye rockfish (Puget Sound/Georgia Basin DPS) that is present outside of the critical habitat exclusion area. Although, in-water work would be conducted within the allowable in-water work window to minimize impacts to juvenile salmonids (from July 16 – February 15 [USACE 2017]), this work window would also minimize potential impacts to other fish species that occur within the Demolition, Construction, and Operations ROI as in-water work would be prevented from occurring year round and would instead be limited to up to 214 days each year for up to 15 years.

Pile removal activities would likely result on short-term and intermittent adverse impacts to fish. Removal of contaminated sediment through dredging and removal of up to 27 timber piles that may be creosote-treated would result in a beneficial impact to fish through improved benthic and nearshore habitats but slightly less beneficial impacts than under Alternative 2.

Operation-related Impacts

Marine Mammals
Operation-related impacts under this alternative are the same as described under Alternative 2.

Birds
Operation-related impacts under this alternative are the same as described under Alternative 2.

Marine Vegetation and Marine Invertebrates
The types of operation-related impacts would be similar to those described for Alternative 2. As shown in Table 3.5-17, long-term loss of marine vegetation as a result of new overwater shading would occur over a larger area (up to 2.29 acres) than under Alternative 2 (Figure 3.5-16).

Fishes
Operation-related impacts under this alternative are the same as described under Alternative 2.

Summary of Impacts to Federally Protected Species

Pursuant to the ESA, construction impact stressors (turbidity, underwater/airborne noise, benthic invertebrate and vegetation loss, temporary displacement of forage fish, entrainment, nearshore barriers/overwater shade/overwater lighting [including artificial lighting]) may affect killer whale (Southern Resident DPS), humpback whale (Central American and Mexico humpback whale DPSs), marbled murrelet, Chinook salmon (Puget Sound ESU), steelhead (Puget Sound DPS), bocaccio rockfish and yelloweye rockfish (Puget Sound/Georgia Basin), and bull trout (Coterminous U.S. DPS). The Navy is consulting with USFWS and NMFS for these species, as required by Section 7(a)(2) of the ESA.

Under the MBTA regulations applicable to military readiness activities (50 CFR Part 21), the impacts of the above listed stressors, as described under Alternative 2, would not result in adverse effects on populations of seabirds, shorebirds, and other birds protected under the MBTA.

Under the MMPA regulations, “take” of marine mammals are anticipated due to the acoustic stressors from underwater pile driving noise activities. The Navy is consulting with NMFS and will request a LOA for incidental take.

Under the MSA, EFH would be affected by the above stressors. The Navy is consulting with NMFS through the preparation of an EFH Assessment in combination with a Biological Assessment as required under the ESA.

Effects Associated with Reasonably Foreseeable Future Actions

Effects to biological resources from Reasonably Foreseeable Future Action would be the same as described in Section 3.5.3.4.

NAVBASE Kitsap-Bangor

Construction-related Impacts

Under Alternative 3, only the existing Radio Hill complex would be expanded as described under Alternative 2 as there would be no construction of a new forge shop, thereby reducing the total amount of vegetation cleared. As described under Alternative 2, wildlife occurring in the area would likely avoid the area temporarily during the day when construction activity is taking place and return at night. As vegetation clearing progresses, wildlife would be forced to seek out other suitable habitat and less

mobile species and active nests would potentially be destroyed. However, as found in a recent habitat survey (Navy 2023a), suitable marbled murrelet habitat was determined to exist within the ROI, so this species may be affected by the Proposed Action, and the Navy is currently consulting with USFWS under the ESA.

Bald eagles would likely be present only briefly either resting or in flight but would likely avoid the area during construction. The nearest recorded bald eagle's nest is approximately 2.9 miles (4.7 km) north of the Alternative 3 Proposed ROI. There would be no permanent impacts to bald eagle with implementation of Alternative 3.

Therefore, impacts to wildlife and habitat under Alternative 3 would be less than under Alternative 2. Noise impacts to wildlife would be short-term and not significant with implementation of Alternative 3.

Operations-related Impacts

Under Alternative 3, operation of the expanded Radio Hill complex may create a slight change in ambient noise conditions but is not expected to be at levels that would create potential long-term impacts to wildlife and biodiversity in general (Sordello et al. 2020) as compared to Alternative 2. There would be a loss of habitat and disruption to species that occur in the area. Over time, wildlife species may permanently leave the area and seek out other vegetation/rural locations on the installation or acclimate to the new ambient sound levels.

Effects Associated with Reasonably Foreseeable Future Actions

Effects to biological resources from Reasonably Foreseeable Future Action would be the same as described in Section 3.5.3.4.

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3.6 Cultural Resources

This section reviews cultural resources to assess potential impacts of the Proposed Action. Cultural resources consist of resources subject to consideration under NEPA, the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act, and similar laws. This discussion of cultural resources encompasses buildings, districts, landscapes, sites, structures, objects, and ethnographic resources, as well as other physical evidence of human activity that are considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons.

Cultural resources include but are not limited to historic properties as defined under NHPA that are listed or eligible for listing in the National Register of Historic Places (NRHP), including National Historic Landmarks (NHLs). Historic properties may also include Traditional Cultural Places (TCPs) that have religious and cultural significance. Under NEPA, consideration of cultural resources also comprises those which do not meet NRHP criteria, such as human remains, funerary objects, sacred objects, and objects of cultural patrimony subject to the Native American Graves Protection and Repatriation Act, Indian sacred sites, traditional resources, and other resources of cultural significance. For the purposes of this EIS, the cultural resources analysis is divided into three broad categories of resources: archaeological resources, historic architectural resources, and TCPs.

Sociocultural elements, such as traditions, lifeways, religious practices, community values, spiritual wellbeing, and social institutions may be considered by some groups to be types of cultural resources, especially within Tribal communities whose traditional interaction with the natural world is integral to their culture. These resources are discussed in Section 3.7 American Indian Traditional Resources. Other resources considered by Tribal communities to be of cultural significance include air, water, and wildlife. These resources are discussed in Section 3.2 Air Quality, Section 3.3 Water Resources, and Section 3.5 Biological Resources.

3.6.1 Regulatory Setting

The Navy is coordinating its NEPA review with the NHPA process for the Proposed Actions (54 U.S.C. section 300101 et seq.). Section 106 of the NHPA (Section 106) (54 U.S.C. section 306108) and its

implementing regulations (36 CFR Part 800) require federal agencies to take into account the effects of a federal undertaking on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the undertaking. Section 110(f) of the NHPA (54 U.S.C. section 306107) requires federal agencies to minimize harm to NHLs to the maximum extent possible.

The Navy is consulting with the ACHP, the National Park Service, the Washington State Historic Preservation Officer (SHPO), Indian Tribes, and other interested parties to develop a Section 106 Memorandum of Agreement (MOA) consistent with 36 CFR Part 800 to resolve potential adverse effects to historic properties that may result from the Proposed Action. The Navy invited public engagement and comments pursuant to the Section 106 process, beginning with the NEPA scoping. Consistent with Section 106, the Navy consults with federally recognized Indian Tribes on federal actions with the potential to affect resources of religious and cultural significance to Indian Tribes. Tribal consulting parties include the Suquamish Tribe (Suquamish ancestral group); Skokomish Indian Tribe (Twana ancestral group); and Port Gamble S'Klallam, Jamestown S'Klallam, and Lower Elwha Klallam Tribes (Klallam and Chemakum ancestral groups). The Navy has a post-review discovery plan for archaeological resources that applies to NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor (Navy 2023).

The Proposed Action will require a Department of the Army permit from the USACE pursuant to Section 10 of the Rivers and Harbors Act of 1899 and/or Section 404 of the Clean Water Act. The Navy and USACE have agreed that the Navy will serve as the lead federal agency for the purposes of Section 106 compliance for the undertaking.

Table 3.6-1 provides a list of the existing regulatory environment for cultural resources under federal jurisdiction. Appendix C lists applicable laws and regulations.

Table 3.6-1 Regulatory Setting for Cultural Resources

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
National Historic Preservation Act of 1966, as amended	54 U.S.C. 300101 et seq. Section 106 (54 U.S.C. 306108) Section 110(f) (54 U.S.C. 306107) 36 CFR Part 800 are the implementing regulations for NHPA Section 106.
Native American Graves Protection and Repatriation Act of 1990	25 U.S.C. sections 3001-3013 43 CFR Part 10 are the implementing regulations.
Archaeological Resources Protection Act of 1979	16 U.S.C. sections 470aa-470mm 32 CFR Part 229 are the DoD-specific implementing regulations.

Legend: CFR = Code of Federal Regulations; DoD = Department of Defense; NHPA = National Historical Preservation Act; U.S.C. = United States Code

Source: OPNAV 2021

3.6.2 Affected Environment

The ROI for cultural resources encompasses the geographic area where project actions may impact cultural resources. The noncontiguous ROI encompasses the two alternative project locations at NAVBASE Kitsap-Bremerton and the two project locations at NAVBASE Kitsap-Bangor. At NAVBASE Kitsap-Bremerton, the ROI encompasses the project footprint and is bound by direct sight lines up to 1 mile from the project actions to take into account potential impacts to the setting (Figure 3.6-1). At NAVBASE Kitsap-Bangor, the ROI includes the project areas and their associated laydown and access routes with a buffer to accommodate configuration changes. The NAVBASE Kitsap-Bangor ROI has a smaller buffer than NAVBASE Kitsap-Bremerton because the surrounding topography and vegetation limit sight lines (Figure 3.6-2). The ROI is different from the Section 106 Area of Potential Effects, defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. Through consultation, the Navy is determining the Area of Potential Effects to account for the preferred alternative and the areas where the Navy would implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under CWA Section 404.

3.6.2.1 Existing Conditions

For the purposes of this analysis, cultural resources are divided into three major categories:

- Architectural resources, which include standing buildings, structures, districts, and landscapes of historic or aesthetic significance.
- Archaeological resources, which include the place or places where the remnants of a past culture survive in a physical context that allows for the interpretation of these material remains.
- TCPs associated with cultural practices and beliefs of a living community that are (a) rooted in the community's history and (b) important to maintaining the continuing cultural identity of the community.

Cultural and Historical Overview

Ancestral Northwest Coast peoples from the Suquamish, Klallam, Chemakum, and Twana traditionally lived in winter villages and seasonal home sites on the Kitsap Peninsula and harvested marine and terrestrial resources from Sinclair Inlet, Hood Canal, and surrounding uplands. Currently, their descendants continue harvesting and management activities in the same region (Dunn et al. 2021). Recorded ethnographic villages were at Point White, Chico, Port Orchard, and others in the surrounding area. For example, the Suquamish place name for Sinclair Inlet means "sea cucumber". It also referred to a seasonal village at the mouth of Gorst Creek at the south end of Sinclair Inlet (Snyder 1968). Contact with non-Native explorers led to introduction of new diseases that decimated Native American populations. Land disputes caused by an influx of non-Native settlers eventually led to the 1855 signings of the Treaty of Point No Point with the Twana, Klallam, and Chemakum and the Treaty of Point Elliott with the Suquamish and others. Many Tribes ceded their traditional lands in exchange for guaranteed rights and reserved lands (Dunn et al. 2021).

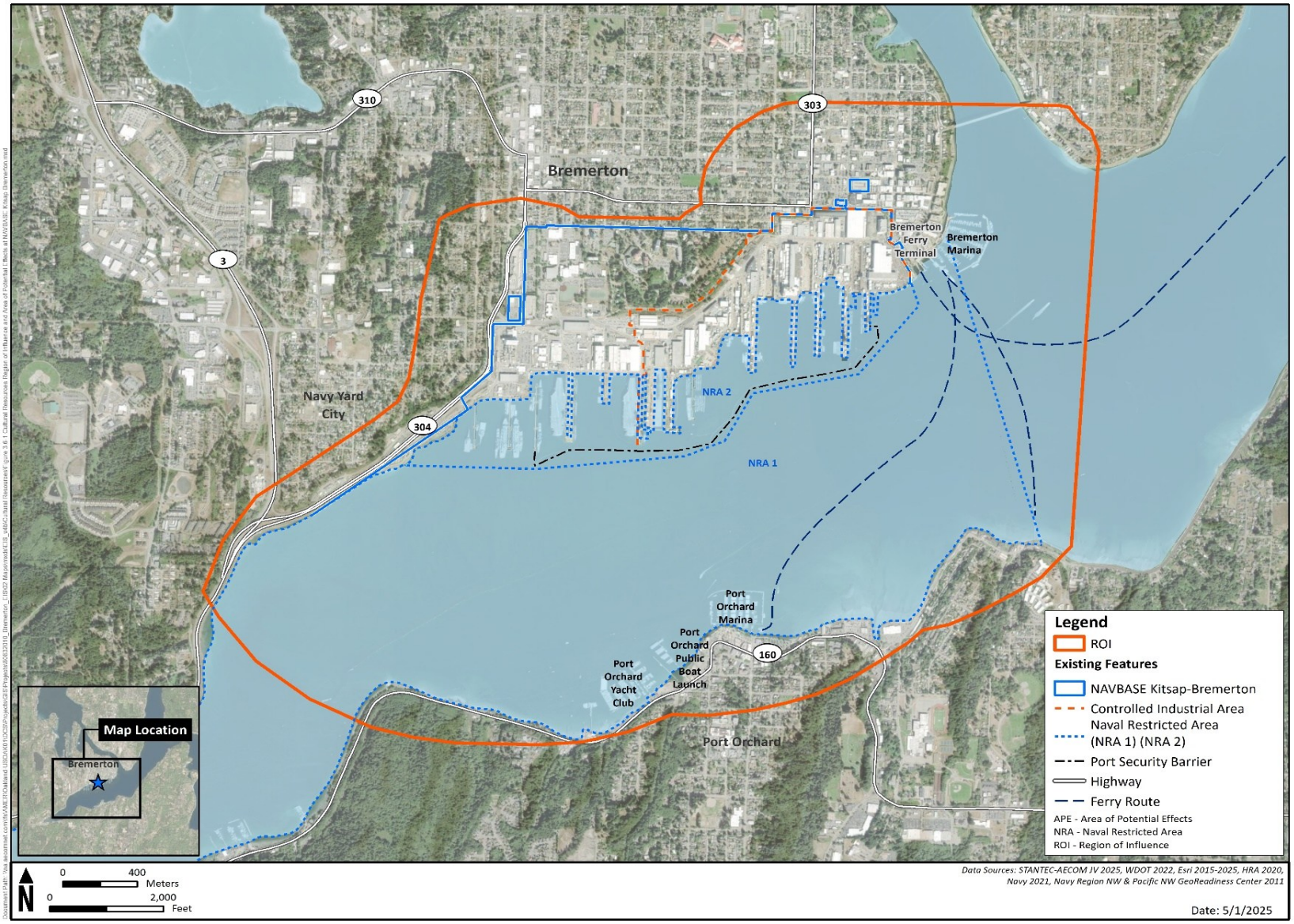

Figure 3.6-1 Cultural Resources Region of Influence at NAVBASE Kitsap-Bremerton

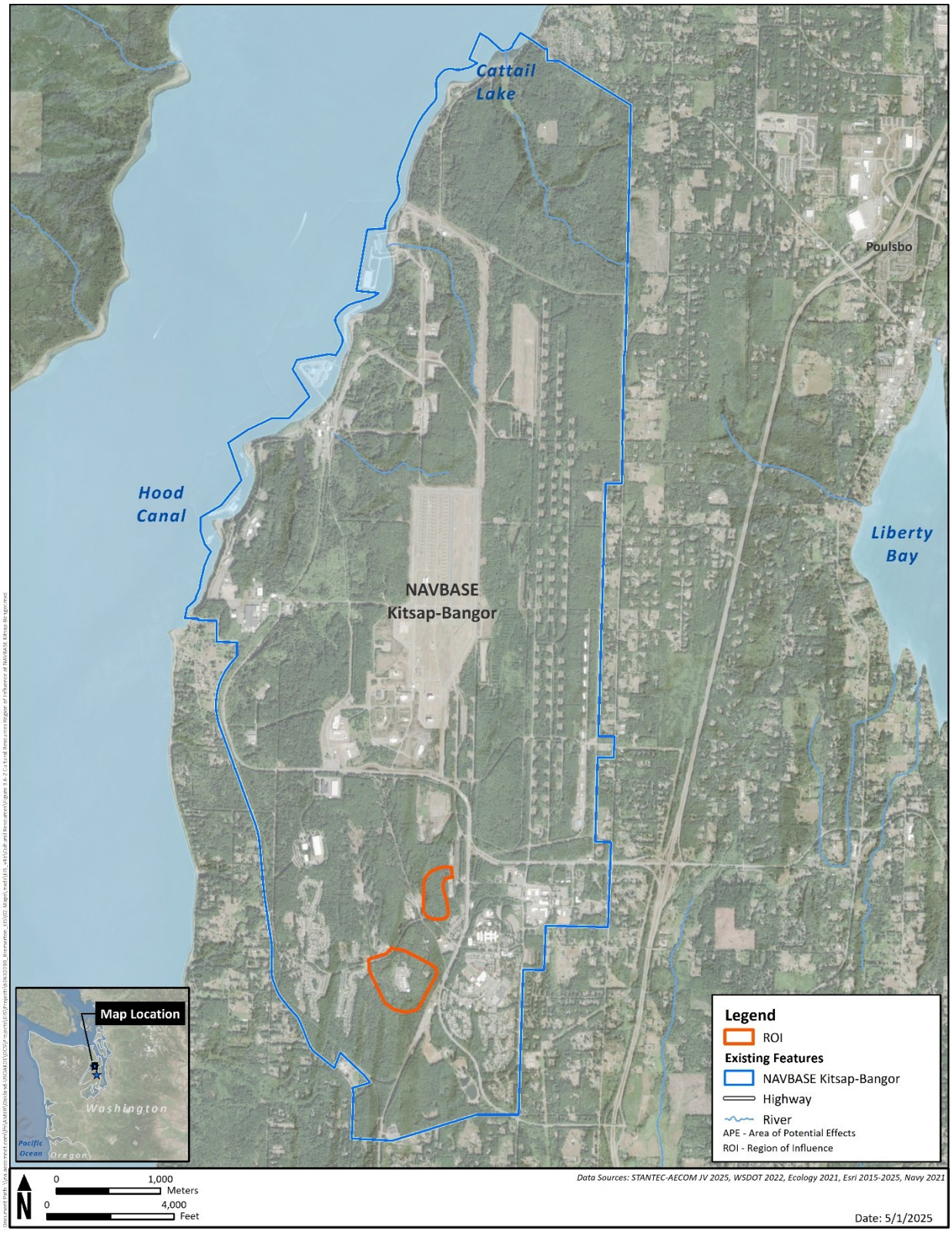

Figure 3.6-2 Cultural Resources Region of Influence at NAVBASE Kitsap-Bangor

NAVBASE Kitsap-Bremerton

NAVBASE Kitsap-Bremerton is located on the ancestral lands of the Suquamish People, who occupied the Kitsap Peninsula along Sinclair Inlet, the Port Washington Narrows, and Dyes Inlet to fish, collect shellfish, hunt, collect plants, recreate, and host inter-Tribal gatherings during the early historic period (Hilbert et al. 2001; James and Martino 1984; Snyder 1968). The Suquamish had many seasonal camps along the coastline of the Kitsap Peninsula, with larger, more permanent settlements across the Sinclair Inlet from NAVBASE Kitsap-Bremerton at Port Orchard and at Point White on Bainbridge Island. Historic maps depict two Suquamish seasonal camps in the vicinity of NAVBASE Kitsap-Bremerton at Point Turner and in the general southwest vicinity of the installation (U.S. Coast Survey 1889). The two sites consisted of temporary structures, fenced areas, and roads within marshy areas and were used seasonally through at least 1889 (U.S. Coast and Geodetic Survey 1881, 1889). Anthropologist T. T. Waterman recorded over 14 ethnographic place names in Sinclair Inlet from Suquamish Indian Tribal elders between 1919 and 1920 (Hilbert et al. 2001; Waterman ca. 1920a, ca. 1920b). In the early 1950s, anthropologist Warren Snyder (1968) confirmed nine of the place names in his interviews with the elders. Most place names correlate with seasonal camps, villages, and/or archaeological sites.

In summary, Suquamish People have used the NAVBASE Kitsap-Bremerton vicinity intensively since time immemorial and retain their exclusive use rights to the area today. Archaeological data, historic period accounts, and recollections from Suquamish elders provide a rich, detailed culture history of the Suquamish People in Sinclair Inlet and Port Washington Narrows.

Non-native settlement in the Kitsap Peninsula began to grow in the 1850s. The ROI was logged in the 1860s and 1870s, and the basins were used to transport logs and workers to and from the forest. Several owners held parcels in the ROI when the Navy began pursuing land acquisition, including William Bremer, who filed the Bremerton town plat in 1891 (LAAS 2000; Stell 2013a).

PSNS was established in 1891, two years after the Naval Act of 1889 signaled a shift in American foreign policy which embraced new imperial ambitions through the construction of a sea-going battleship fleet (HRA 2017). From its founding until the onset of World War II, PSNS repaired battleships. During World War I, PSNS expanded its capabilities beyond repair functions to include shipbuilding, constructing 42 vessels by 1919 (Levy 1990).

Federal funding during the 1930s that reinvigorated the steel and shipbuilding industries led to further development at PSNS, including the construction of the 250-gross-ton Hammerhead Crane in 1933 (HRA 2017). PSNS made its most significant historic contributions during World War II by constructing, repairing, or modernizing nearly 400 ships—over a third of the entire U.S. fleet (HRA 2017).

Throughout the 1950s and 1960s, as part of the Navy's Cold War efforts, the shipyard shifted its mission to begin servicing and upgrading nuclear-powered vessels (HRA 2020). Following the Cold War, PSNS pivoted into a deactivation role, retiring nuclear-powered vessels beginning in 1986 and ultimately developing a nuclear ship and submarine recycling facility in 1990 (HRA 2017).

The shipyard's waterfront setting has been a visual focal point within Sinclair Inlet throughout its development. PSNS & IMF and its associated architectural resources are present in the setting of NAVBASE Kitsap-Bremerton; the Officers' Row Historic District; ferry routes that have operated since the 1930s; and residential, commercial, government, and natural areas in nearby Port Orchard and Retsil, Washington.

NAVBASE Kitsap-Bangor

NAVBASE Kitsap-Bangor is within ancestral lands claimed by the Twana (Skokomish Tribe) and the Suquamish Tribe. It also was periodically used by the S'Klallam for resource procurement seasonally around treaty times. The Twana established permanent winter camps along Hood Canal south and southwest of NAVBASE Kitsap-Bangor, near the mouths of large drainages on the west side of Hood Canal and used smaller summer camps intermittently to gather resources and to unite with families from other villages. The current NAVBASE Kitsap-Bangor area was likely used for camping during summer procurement rounds, and the area from King Spit to Port Gamble is referred to by the Twana as the "slca'wks" or "farthest down stretch" (Thomas 2011:15). The Suquamish had a permanent village, ətəaʔuks (Waterman ca. 1920b), north of Seabeck and near the mouth of Anderson Creek on the eastern shore of Hood Canal, where a trail, čáuks (Waterman ca. 1920b), connected Suquamish camps and villages on Hood Canal with Suquamish settlements in Dyes Inlet (Elmendorf 1992; Miller and Snyder 1999; Snyder 1968; Waterman ca. 1920b). Suquamish informants provided place names for over 15 localities in Hood Canal near and on NAVBASE Kitsap-Bangor, including spʔualu (Little Beef Harbor), tʔkáca (Big Beef Harbor), and ċaqʷtůaʔkʷi (King's Spit) south of Bangor, and tx̌wúbəd (Devil's Hole) on NAVBASE Kitsap-Bangor (Waterman ca. 1920b). The Suquamish fished for salmon throughout the year along the eastern shore of Hood Canal in the NAVBASE Kitsap-Bangor vicinity and harvested other fish species, shellfish, land game, sea mammals, wood for technological use, and a variety of vegetation types (Miller and Snyder 1999). Interaction among Tribal groups occurred during salmon harvests, through intermarriage, and through ceremonial partnerships (Miller and Snyder 1999; Stell 2013b).

Non-native settlement began to grow in the 1840s. The town was originally known as Three Spits for the land masses that jut into Hood Canal. When the town was formed, the majority of settlers were of Scandinavian descent and were engaged in logging, farming, and fishing. Logging was one of the primary industries and the entire Bangor area was logged between the early 1840s and the mid-1930s. A clam cannery was barged into Bangor dock in 1914 and became a significant part of the local economy (Stell 2013b).

NAVBASE Kitsap-Bangor was established during World War II as a munitions depot for the Navy's U.S. Pacific Fleet. In 1944, the Navy purchased over 7,000 acres of residential and commercial parcels in the town of Bangor to construct the depot. In 1962, Bangor became an assembly facility for Polaris missiles for the Pacific Polaris Fleet (Bryant and Parrish 2013). In 1973, Bangor was selected as the home port for the Ohio-class Trident Fleet Ballistic Missile submarines, and the Trident Submarine Base at NAVBASE Kitsap-Bangor was subsequently activated in 1977 (Dunn et al. 2021). NAVBASE Kitsap-Bangor has also served as the terminus for the Navy's Shelton-Bangor Railroad since the installation's construction.

Architectural Resources

NAVBASE Kitsap-Bremerton Region of Influence

The ROI at NAVBASE Kitsap-Bremerton includes the Navy Yard Puget Sound (NYPS) NHL, the NRHP-eligible PSNS Historic District, four NRHP-listed historic districts, and individual NRHP-eligible historic properties, all within the installation (Figure 3.6-3). The ROI also encompasses non-installation areas that have NAVBASE Kitsap Bremerton in their setting.

The NYPS NHL was listed in 1992 and is significant at a national level for its role as the primary battleship repair facility for the Pacific Fleet during World War II, including the five damaged vessels at Pearl Harbor resurrected to become the Ghost Fleet (Levy 1990; Thompson 1992). Its period of significance is

1938–1945. The NYPS NHL encompasses a portion (189 acres [76 hectares]) of the Controlled Industrial Area and includes World War II-era buildings and structures (Levy 1990).

The Navy determined the PSNS Historic District NRHP-eligible following an architectural resources survey conducted in 2017–2018. The historic district encompasses the entire Controlled Industrial Area, including the NYPS NHL (Figure 3.6-3). The survey of the district included NRHP eligibility determinations for all buildings and structures built in or prior to 1991, including consideration for the Navy's Cold War-era resources (HRA 2017). Contributing buildings and structures within the PSNS Historic District include industrial buildings that range in size and function and structures such as dry docks, piers, pump wells, cranes, and rails. The Navy also determined additional resources outside the CIA individually eligible following an architectural resources survey conducted in 2019–2020 (HRA 2020).

Four additional historic districts at NAVBASE Kitsap-Bremerton were listed in the NRHP in 1990: Officers' Row, Hospital Reservation, Marine Reservation, and Puget Sound Radio Station (Figure 3.6-3). The Officers' Row Historic District includes historical views of the shipyard's shoreline, buildings, and piers that were intentionally incorporated into the original design. Other historic properties include NAVBASE Kitsap-Bremerton's overall industrial shipyard presence as part of the historical setting, but views of shipyard facilities are incidental, lack a direct and intentional historic association to nearby cultural resources, and therefore do not characterize the significance of these resources.

A review of the Washington State Department of Archaeology and Historic Preservation's Washington Information System for Architectural and Archaeological Records Data system identified architectural resources outside NAVBASE Kitsap-Bremerton boundaries but within the NAVBASE Kitsap-Bremerton ROI, including 30 historic properties

NAVBASE Kitsap-Bangor Region of Influence

The NAVBASE Kitsap-Bangor ROI includes a non-contributing segment of the NRHP-eligible Shelton-Bangor Railroad Corridor Historic District. The historic district follows the edge of the NAVBASE Kitsap-Bangor ROI at the southwest and southeast ends. A historic-era Transmitter Building is in the ROI, but outside the project footprint; preliminary results of an architectural survey recommended the resource as not eligible for the NRHP (DAHP 2023). Resources associated with the Navy's World War II-era railroad munitions sorting complex in the northern portion of the NAVBASE Kitsap-Bangor ROI were previously demolished.

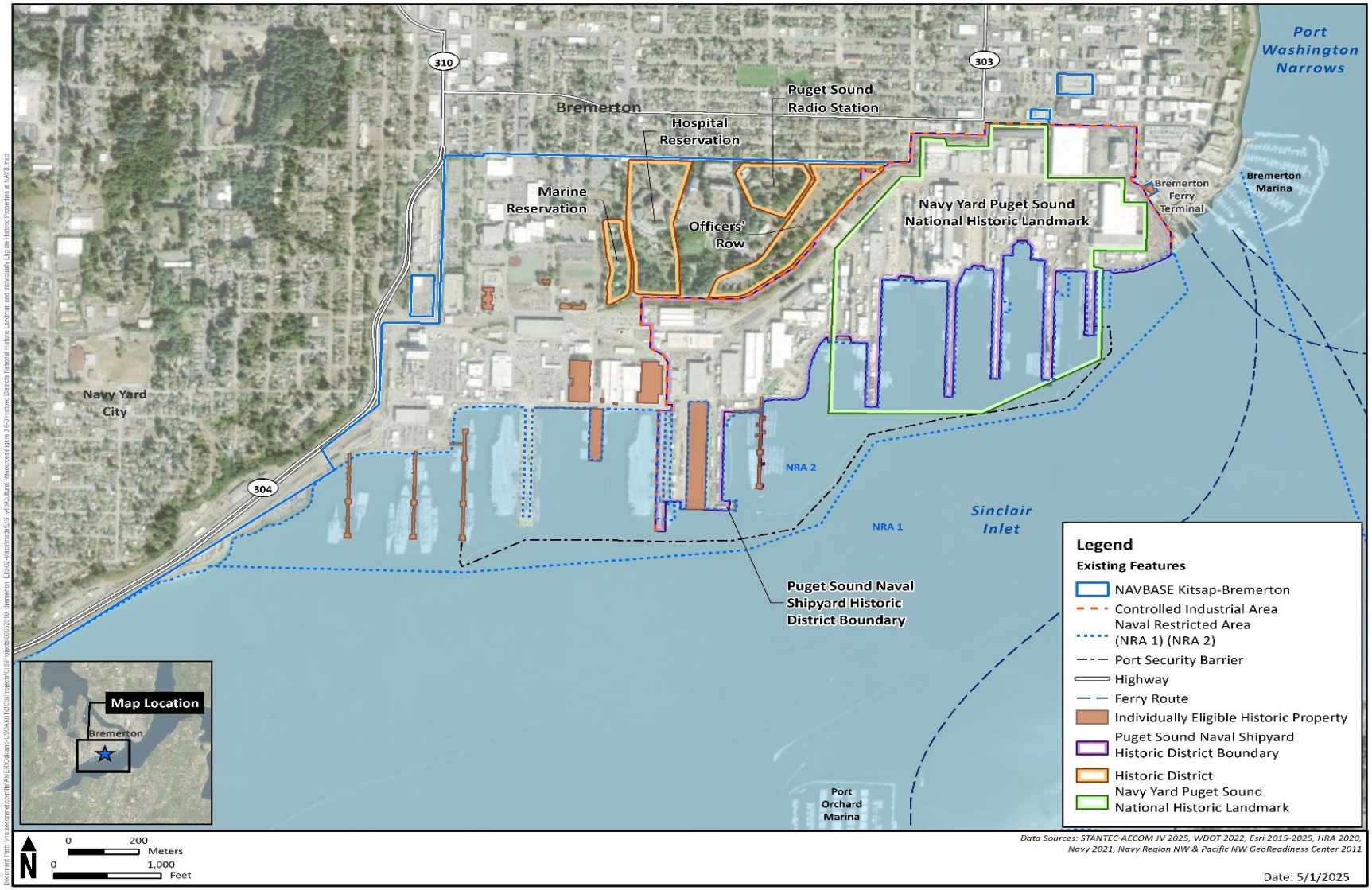

Figure 3.6-3 Historic Districts, National Historic Landmark, and Individually Eligible Historic Properties at NAVBASE Kitsap-Bremerton

Archaeological Resources

NAVBASE Kitsap-Bremerton Region of Influence

A review of existing reports (LAAS 2000, Stell 2013a, OVAI 2022) and Washington Information System for Architectural and Archaeological Records Data managed by the Washington State Department of Archaeology and Historic Preservation identified one previously recorded archaeological resource at NAVBASE Kitsap-Bremerton. Site 45KP00268 is a subsurface historic debris scatter in the Puget Sound Radio Station Historic District at NAVBASE Kitsap-Bremerton. The site was recommended not eligible for the NRHP (Stell 2013a). No archaeological resources of interest or significance to Indian Tribes have been identified through survey efforts or consultation. A study in 2000 identified no archaeological deposits in shovel probes or on the ground surface and reported that NAVBASE Kitsap-Bremerton was extensively disturbed by grading, excavation, multiple fill episodes, dock and pier building, road construction, and building construction. Most of the terrestrial area consists of paved roads, parking lots, and structures. Testing at unpaved, level areas have identified fill deposits (LAAS 2000). Known archaeological resources in the ROI not within NAVBASE Kitsap-Bremerton include historic debris sites in Bremerton (45KP00150, 45KP00159, 45KP00160, 45KP00268, and 45KP00309) and a hunter-gatherer site in Port Orchard (45KP00115) (DAHP 2023). Sinclair Inlet has a high number of Suquamish place names, emphasizing its importance to the Tribe, and existing fill material may contain archaeological resources.

Previous archaeological surveys conducted at NAVBASE Kitsap-Bremerton indicate low, moderate, and high probability for archaeological resources within the ROI (LAAS 2000, Stell 2013a, OVAI 2022). The 2022 maritime study indicates moderate/high and high archaeological sensitivity for in-water areas in the NYPS NHL and around Moorings E, F, and G. The study indicates mostly low and moderate archaeological sensitivity west of the NYPS NHL. The PSNS & IMF shoreline is modern fill, meaning any archaeological sites encountered in these areas would likely date to historical time periods or be out of context. Construction activities that extend beyond the depth of fill would have a higher probability of encountering pre-contact archaeological resources (OVAI 2022).

The 2013 study includes a cultural resources sensitivity model for NAVBASE Kitsap-Bremerton that incorporates previous models prepared by Larson Anthropological Archaeological Services Limited and the Suquamish Tribe, geophysical data on ground disturbance and cut/fill patterns, and the Washington State Department of Archaeology and Historic Preservation's statewide predictive model. The 2013 model identifies a broad swath of Low to No Probability for most of the ROI, with areas of moderate probability in deep (20-50 feet) fill areas upland from the shoreline and in the NYPS NHL, and shallow (0-20 feet) fill areas near DD4 and upland from Pier D. The upland areas of fill beyond the historic shoreline were considered to have low probability for archaeological resources due to extensive cutting and filling associated with the shipyard's construction and development; however, fill deposits may contain archaeological resources moved from their original context (Stell 2013a; OVAI 2022).

A 2011 nautical chart (last updated 2024) shows three underwater obstructions in Sinclair Inlet in the ROI; two are approximately halfway between Mooring F and the Port Orchard shoreline; one is southwest of Mooring G (Office of Coast Survey 2025).

NAVBASE Kitsap-Bangor

Portions of the NAVBASE Kitsap-Bangor ROI have been disturbed due to grading activities. A recent study identified two cultural resources in the ROI, a site containing historic-era earthen covered debris piles (45KP345) and a historic-era isolate (45KP346); the Navy determined both not eligible for the NRHP

with concurrence from the Washington SHPO (AECOM 2024). Studies prior to 2024 did not identify any cultural resources (NWAA 2003; HDC 2010; Pollock 2018). Previous studies have found that the southern portion of the NAVBASE Kitsap-Bangor ROI has low probability to contain precontact archaeological sites and moderate probability for historic-era archaeological sites. Local Tribes harvest plants from this area, including but not limited to berries from members of the genera *Sapindus*, *Mahonia*, *Typha*, and *Vaccinium* as well as cedar bark. A previous survey observed modern use of the surrounding area for peeled cedar tree harvesting, although no modified trees are recorded in the ROI (Dunn et al. 2021).

Traditional Cultural Places

The Navy is consulting with American Indian Tribes regarding the presence of TCPs or sacred sites in the ROI; none have been previously identified.

3.6.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Table 3.6-3 summarizes the effects to cultural resources associated with RFFAs with a close causal relationship to the project at NAVBASE Kitsap-Bremerton.

Table 3.6-3 Effects to Cultural from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

RFFA	*Geographic Overlap*	*Influence on Resource*
Navy –Pier 3 Electrical Substation Repair, PSNS & IMF	Geographic overlap with NYPS NHL and PSNS Historic District	This RFFA would occur within the NYPS NHL and PSNS Historic District and involves demolition of non-contributing resources and new construction at DD4 and Pier 3, which are contributing resources within the NYPS NHL and PSNS Historic District.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF, and NAVBASE Kitsap-Manchester	Geographic overlap with NYPS NHL and PSNS Historic District	This RFFA would occur within the NYPS NHL and PSNS Historic District and involves maintenance activities and replacement of character-defining timber piles at Piers 4 and 5, which are contributing resources within the NYPS NHL and PSNS Historic District.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	Outside the ROI at NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	This RFFA would have no impacts on cultural resources in the ROI and has no causal relationship to the project at NAVBASE Kitsap-Bremerton.
Navy – SIOP, PSNS & IMF	Geographic overlap with NYPS NHL and PSNS Historic District	This RFFA would occur within the NYPS NHL and PSNS Historic District. Actions associated with the SIOP program may result in adverse effects to historic properties and contributing resources within the NYPS NHL and/or PSNS Historic District.
Navy – Operable Unit B Marine Source Removal Actions	Outside the ROI	This RFFA would have no impacts on cultural resources in the ROI and has no causal relationship to the project at NAVBASE Kitsap-Bremerton.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	This RFFA would have no impacts on cultural resources in the ROI and has no causal relationship to the project at NAVBASE Kitsap-Bremerton.

RFFA	*Geographic Overlap*	*Influence on Resource*
Navy – Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	Outside the ROI	This RFFA would have no impacts on cultural resources in the ROI and has no causal relationship to the project at NAVBASE Kitsap-Bremerton.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	Outside the ROI	This RFFA would have no impacts on cultural resources in the ROI and has no causal relationship to the project at NAVBASE Kitsap-Bremerton.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Outside the ROI	This RFFA would have no impacts on cultural resources in the ROI and has no causal relationship to the project at NAVBASE Kitsap-Bremerton.
Port of Bremerton - Marina Breakwater Replacement, Port Orchard Marina	Geographic overlap with ROI; no overlap with NYPS NHL or PSNS Historic District	This RFFA would occur within the 1-mile buffer with direct sight lines toward project actions. Actions from the marina breakwater replacement would have no causal relationship to cultural resources impacted by project actions.
Private Development – The Beacon and Beacon II	Outside the ROI	This RFFA would have no impacts on cultural resources in the ROI and has no causal relationship to the project at NAVBASE Kitsap-Bremerton.
Private Development – McWilliams Apartments	Outside the ROI	This RFFA would have no impacts on cultural resources in the ROI and has no causal relationship to the project at NAVBASE Kitsap-Bremerton.

Legend: DD = dry dock; Navy = United States Department of the Navy; NHL = National Historic Landmark; NYPS = Navy Yard Puget Sound; PFAS = per and polyfluoroalkyl substances; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; RFFA = reasonably foreseeable future action; ROI = Region of Influence; SIOP = Shipyard Infrastructure Optimization Program

Table 3.6-4 summarizes the effects to cultural resources associated with RFFAs with a close causal relationship to the project at NAVBASE Kitsap-Bangor.

Table 3.6-4 Effects to Cultural Resources from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

RFFA	*Geographic Overlap*	*Influence on Resource*
Transit Protection Program Support Facilities	Outside the ROI	This RFFA would have no impacts on cultural resources in the ROI. Ground disturbing activities from construction of new facilities could impact archaeological resources, if present.
Child Development Center	Outside the ROI	The existing facility was determined not eligible for the NRHP. RFFA would occur within the previously disturbed existing facility site and is unlikely to impact archaeological resources.
Military Working Dog Kennel Replacement	Outside the ROI	The existing facility is not an identified cultural resource. RFFA would occur within the previously disturbed existing kennel site and is unlikely to impact archaeological resources.
Substation 5 Repair	Outside the ROI	RFFA would occur within the previously disturbed existing substation site. The existing facility is not an identified cultural resource.

RFFA	*Geographic Overlap*	*Influence on Resource*
Tang Road Repair	Outside the ROI	The existing road is not an identified cultural resource. Ground disturbing activities could impact archaeological resources if present. An archaeological monitor has been present during repair work; no archaeological resources have been identified.
Equipment Processing Building	Outside the ROI	Ground disturbing activities from construction of new facilities could impact archaeological resources if present.
Relocate Flier Road	Outside the ROI	The existing road is not an identified cultural resource. Ground disturbing activities could impact archaeological resources if present.
Navy – CERCLA actions for PFAS	Various sites may overlap the ROI	This RFFA may include PFAS actions at sites that overlap with cultural resources at NAVBASE Kitsap-Bangor. CERCLA response actions would meet substantive requirements of Section 106.
Navy – CERCLA Operable Unit 1 Site A	Outside the ROI	This RFFA would have no impacts on cultural resources in the ROI. Ground disturbing activities from construction of new facilities could impact archaeological resources, if present.
Navy – CERCLA Operable Unit 2 Site F	Outside the ROI	This RFFA would have no impacts on cultural resources in the ROI. Ground disturbing activities from construction of new facilities could impact archaeological resources, if present.
Navy – Alternate Power Transmission Line	Outside the ROI	Excavation and grading activities from construction of new transmission line could impact archaeological resources if present.

Legend: NRHP = National Register of Historic Places; RFFA = reasonably foreseeable future action; ROI = Region of Influence

3.6.3 Environmental Consequences

Analysis of potential impacts to cultural resources considers both permanent and temporary impacts, including adverse effects to historic properties pursuant to Section 106. Permanent impacts may be the result of physically altering, damaging, or destroying all or part of a resource; altering the characteristics of the surrounding environment that contributes to the importance of the resource; introducing visual, atmospheric, or audible elements that are out of character for the period associated with the resource and thereby alter the setting; or neglecting the resource to the extent of deterioration or destruction. Temporary impacts may be the result of auditory, vibration, or visual changes to the surrounding environment that alter the setting but only temporarily as the setting is returned to pre-project conditions after construction. Permanent and/or temporary impacts that result in adverse effects to historic properties would be considered significant under NEPA and would be resolved through Section 106 consultation and implementation of a MOA with mitigation measures. To avoid and/or minimize some, but not all, impacts under NEPA, the Navy would implement cultural resources BMPs provided in Table 3.6-5 and Appendix A as part of the Proposed Action.

Table 3.6-5 Cultural Resources Best Management Practices

BMP	*Title*	*Applicability*
CULT MGMT-BREM-1 CULT MGMT-BANGOR-1	Inform Navy Cultural Resources personnel prior to the start of dredging or ground disturbing activities to ensure compliance with the MOA.	Construction
CULT MGMT-BREM-2 CULT MGMT-BANGOR-2	Follow the Navy's Discovery Plan in the event of post-review discovery of archaeological resources during any project activities.	Construction
CULT MGMT-BREM-3 CULT MGMT-BANGOR-3	Include Navy Cultural Resources personnel in preconstruction meetings to provide a brief to construction personnel about cultural resources and the Navy's Discovery Plan for NAVBASE Kitsap.	Construction
CULT MGMT-BREM-4	Consult with Navy Cultural Resources personnel regarding design of new construction in the NYPS NHL and PSNS Historic District to ensure compliance with the MOA. Include professional(s) on the project design team(s) that meet the Secretary of the Interior's Professional Qualifications Standards for Architectural History (36 CFR Part 61).	Construction
CULT MGMT-BREM-5	Where possible, leave fragments of rail system in place as cultural landscape features of PSNS Historic District.	Construction
CULT MGMT-BREM-6 CULT MGMT-BANGOR-4	Consult with Navy Cultural Resources personnel on any variations from approved plans during project execution, including changes to the demolition schedule, removal of any objects, and design changes=.	Construction
CULT MGMT-BREM-7 CULT MGMT-BANGOR-5	Consult with Navy Cultural Resources personnel to conduct cultural resources desktop analysis of contractor-selected staging and laydown areas.	Construction

Legend: BMP = best management practice; CFR = Code of Federal Regulations; NAVBASE = Naval Base; Navy = United States Department of the Navy; NHL = National Historic Landmark; NYPS = Navy Yard Puget Sound; PSNS = Puget Sound Naval Shipyard

3.6.3.1 Nature and Type of Effects

Demolition or alteration of existing facilities and new construction would result in permanent impacts to cultural resources and cause adverse effects to historic properties pursuant to Section 106. Proposed activities/facilities/structures would alter significant characteristics of historic districts. Construction activities could disturb previously unidentified archaeological resources. Short-term, construction-related impacts to cultural resources, such as vibration and noise, are expected to be negligible.

Adverse effects to historic properties would be considered significant impacts under NEPA but would be resolved through Section 106 consultation and implementation of a MOA with mitigation measures.

3.6.3.2 Impact Assessment Methodology

The impact assessment methodology includes an evaluation of project impacts on cultural resources, including those that may not meet NRHP eligibility criteria but are considered under other laws, as well as effects to historic properties pursuant to Section 106. Under NEPA, the impact analysis is based on the context and intensity or severity of the impact. For the purposes of this analysis, a short-term impact refers to an impact of temporary duration that occurs during the period of construction; a permanent

impact refers to impacts that are irreversible (e.g., the demolition or alteration of a cultural resource, the construction of a new facility that alters significant characteristics of a resource's setting).

Under Section 106, adverse effects occur when an undertaking may alter the characteristics that qualify a historic property for inclusion in the NRHP in a manner that would diminish the integrity of the historic property's location, setting, design, materials, workmanship, feeling, or association (NHPA Criteria for Adverse Effect [36 CFR Part 800.5(a)(1)]). Adverse effects to historic properties are resolved through Section 106 consultation with the Washington SHPO and the ACHP, as well as the National Park Service and/or Indian Tribes, where applicable, and by taking into consideration input from interested parties and the public.

While the Navy is proceeding with Section 106 compliance for the Preferred Alternative and compensatory mitigation areas, the assessment of impacts under NEPA considers the overall Proposed Action and impacted cultural resources. Consideration of potential impacts to cultural resources involves NHPA consultation, input received during the public involvement process, and the involvement of interested parties. Impacts may be lessened by avoidance and/or minimization measures and the implementation of BMPs. Unavoidable adverse effects to historic properties are resolved pursuant to Section 106 through implementation of a MOA or programmatic agreement.

3.6.3.3 Impact Analysis for Alternative 1: No-Action

Under the No-Action Alternative, there would be no project-related impacts to cultural resources. However, other Navy projects would demolish or alter cultural resources, or cultural resources could naturally deteriorate over time. Effects to cultural resources from RFFAs would continue to influence potential impacts, as described in Table 3.6-3 and Table 3.6-4.

3.6.3.4 Impact Analysis for Alternative 2 (Preferred Alternative)

Impacts to cultural resources include the demolition of historic properties, alterations to the NYPS NHL and PSNS Historic District, changes to the setting of the Officers' Row Historic District, and potential disturbance of archaeological resources. Impacts to the NYPS NHL and PSNS Historic District would be significant due to the demolition of contributing resources. Pursuant to Section 106, adverse effects to historic properties would be resolved through consultation and implementation of an MOA, and the Navy's post-review discovery plan would be implemented (Navy 2023).

Construction-related Impacts

Construction-related impacts would demolish and alter cultural resources and would diminish the integrity of the NYPS NHL, PSNS Historic District, and Officers' Row Historic District, resulting in adverse effects to historic properties pursuant to Section 106. Due to the context and intensity of demolition in the NYPS NHL, impacts would be significant and unavoidable. Construction would avoid known archaeological resources, but could damage or destroy previously unknown archaeological resources.

Alternative 2 would demolish 17 historic properties (Figure 3.6-4). All 17 historic properties contribute to the PSNS Historic District, and 13 of these also contribute to the NHL. Alternative 2 would replace E, F, and H streets, which characterize the historical circulation patterns of the NYPS NHL and PSNS Historic District (Table-3.6-6) (AECOM 2022). Construction would result in removal of the historic crane and fragments of rail systems that also contribute to the PSNS Historic District.

Table 3.6-6 Historic Properties Demolished as Part of Alternative 2

Facility Name	*NRHP Eligibility*	*Historical Significance and Presence in Historical Setting*
Tunnels	Contributing resources (4) to NYPS NHL and PSNS Historic District	Four subsurface brick-lined and poured concrete tunnels support shipyard facilities and infrastructure with construction dates ranging from 1896 to 1946.
Storage Facility/Foundry	Contributing resource to NYPS NHL and PSNS Historic District	Storage Facility/Foundry, built in 1912, is a Greek Revival-inspired brick building that originally served as the shipyard foundry.
Pier 4	Contributing resource to NYPS NHL and PSNS Historic District	Built in 1914, Pier 4 is a precast concrete structure with an original gantry crane with its own track system and a substation (Electric Substation No. 4) built in 1924.
DD3	Contributing resource to NYPS NHL and PSNS Historic District	DD3, built in 1919, is a utilitarian stepped concrete structure that was the first of its kind for the Navy and a major accomplishment of noted naval engineer Luther Gregory.
Pier 6	Contributing resource to NYPS NHL and PSNS Historic District	Pier 6, built in 1926, is a utilitarian structure that features the landmark 250-ton Hammerhead Crane as well as crane tracks, rail tracks, and a substation (Electrical Substation 6) built in 1929.
Hammerhead Crane	Contributing resource to NYPS NHL and PSNS Historic District	Hammerhead Crane, built in 1933, is an iconic steel structure at the south end of Pier 6.
Forge, Smith Shop, and Union Office	Contributing resource to NYPS NHL and PSNS Historic District	The Forge, Smith Shop, and Union Office, built in 1939, is a utilitarian poured concrete building that embodies the industrial modern style.
Shipfitter-Welder Shop	Contributing resource to NYPS NHL and PSNS Historic District	The Shipfitter-Welder Shop, built in 1941, is a massive T-shaped, utilitarian shop building dominated by large-scale steel sash windows. The building's position along the waterfront near the ferry terminal makes it one of the more recognizable features of the shipyard.
Pier 7	Contributing resource to NYPS NHL and PSNS Historic District	Pier 7, constructed in 1943, is a World War II-era, heavy-capacity fitting-out pier featuring precast concrete subpiers, a cast-in-place reinforced concrete deck with integrated utilities, a timber pile fender system with crane and train rails along its length, and the original DD2 caisson.

Facility Name	*NRHP Eligibility*	*Historical Significance and Presence in Historical Setting*
Pumpwell 3	Contributing resource to NYPS NHL and PSNS Historic District	Pumpwell 3 is eligible for the NRHP as a contributing resource to the NYPS NHL. Built in 1946 as part of the installation of a removable bulkhead to divide DD3 in two, the utilitarian concrete building is notably less ornate than pumphouses constructed before World War II.
Waterfront Support	Contributing resource PSNS Historic District	Waterfront Support, built in 1929, is a two-story utilitarian brick building.
Dispensary/Shipyard Repair Support Facility	Contributing resource to PSNS Historic District	The Dispensary/Shipyard Repair Support Facility, built in 1938, is an Art-Deco–style brick building constructed as a dedicated medical facility in the industrial shipyard.
Ambulance Garage/Waterfront Storage Shed	Contributing resource to PSNS Historic District	The Ambulance Garage/Waterfront Storage Shed, built in 1940, is a utilitarian corrugated metal building constructed as an ambulance garage to serve the attached dispensary building.
Lead Storage Facility	Contributing resource to PSNS Historic District	The Lead Storage Facility, built in 1963, is a small-scale, boxy, poured concrete industrial facility.

Legend: DD = dry dock; Navy = United States Department of the Navy; NHL = National Historic Landmark; NRHP = National Register of Historic Places; NYPS = Navy Yard Puget Sound; PSNS = Puget Sound Naval Shipyard

Alternative 2 would result in the permanent loss of Pre-World War I and World War I-era buildings and structures in the NYPS NHL and PSNS Historic District, including the Hammerhead Crane and all but one historic pier in the NYPS NHL. The deconstruction and demolition would also alter historically intentional views from the Officers' Row Historic District of the shipyard's shoreline, historic buildings, and piers. Impacts to non-installation cultural resources in the ROI would be negligible.

The demolition of subsurface tunnels that contribute to the NYPS NHL and PSNS Historic District would result in the permanent loss of historic properties and cause adverse effects pursuant to Section 106, but would not alter the setting since those historic properties are underground and not readily visible.

Alternative 2 would introduce new dominant visual elements within the NYPS NHL and PSNS Historic District, primarily centralized around the new M2D2 at DD3. The mass and scale of M2D2 and associated infrastructure would permanently alter the setting and diminish the integrity of the NYPS NHL and PSNS Historic District. For other NAVBASE Kitsap-Bremerton historic properties and non-installation cultural resources in the ROI, new construction would result in negligible impacts to the setting. The replacement of Pier 4 with a new pier, and the new and large-scale M2D2, would be consistent with the shipyard's historic industrial and dynamic shoreline setting of multiple piers and moorings that characterize the PSNS Historic District and historically intentional views from the Officers' Row Historic District.

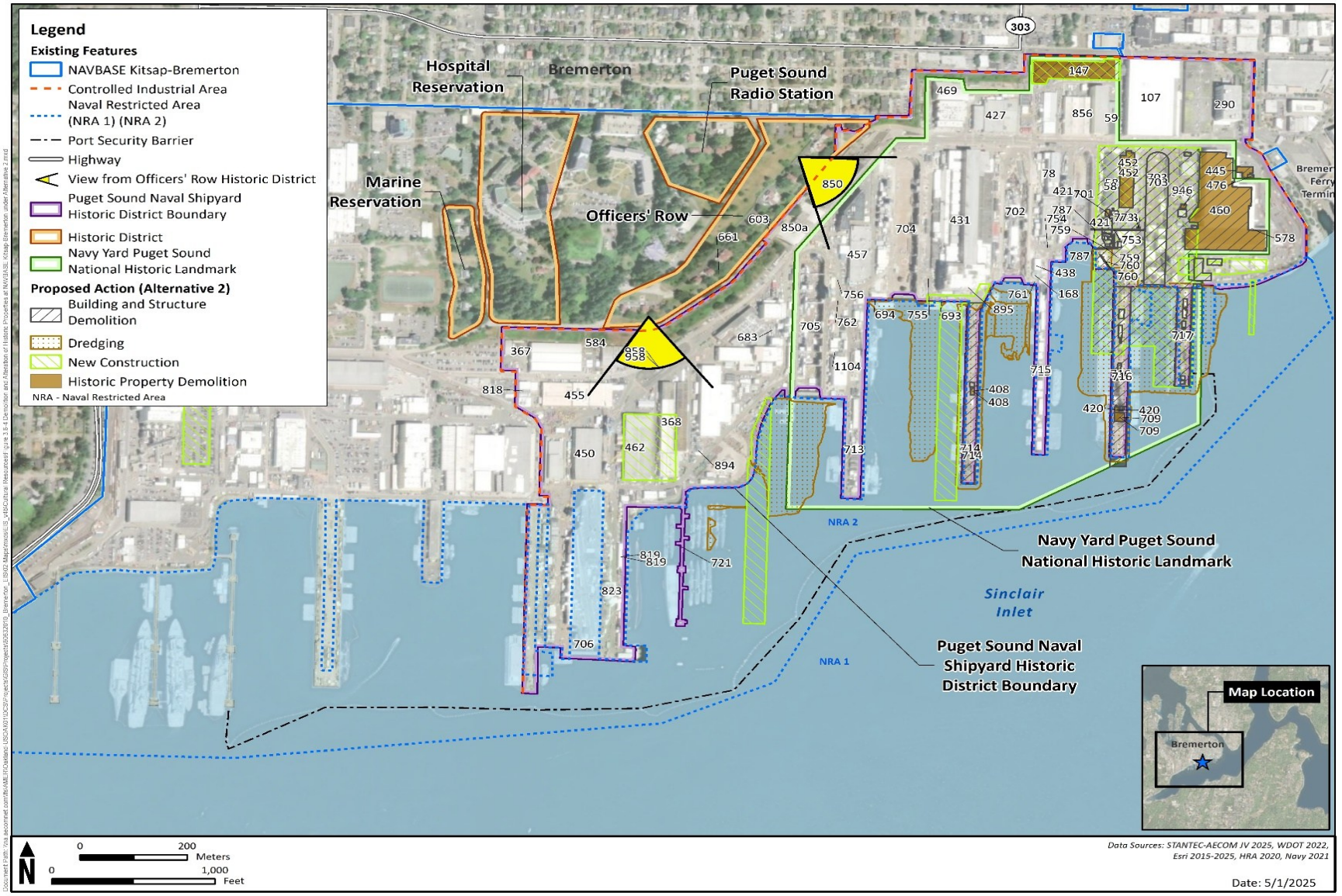

Figure 3.6-4 Demolition and Alteration of Historic Properties at NAVBASE Kitsap-Bremerton under Alternative 2

No impacts to known cultural resources would occur at NAVBASE Kitsap-Bangor. Construction of a new forge shop and expanded mission support area (Radio Hill complex) would not impact the NRHP-eligible Shelton-Bangor Railroad Corridor Historic District or known archaeological resources. Construction activities would occur in a previously surveyed area identified as having low probability for pre-contact archaeological sites and moderate probability for historic-era archaeological sites.

Materials storage and staging activities would occur in previously disturbed areas within NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, on-site offshore on barges or a temporary pier east of Pier 7, and offsite at the contractor multi-use site(s) potentially at the Port of Seattle and/or the Port of Tacoma. Consistent with BMPs, selection of staging areas would include cultural resources analysis conducted by Navy Cultural Resources personnel to avoid impacts to known cultural resources (CULT MGMT-BREM-07 and CULT MGMT-BANGOR-5). Use of laydown areas identified in Figure 2-3 would not impact cultural resources.

Dredging activities would be in and near previously disturbed areas with deep fill (at least 20 feet); however, dredging activities would be deeper and wider than previous dredging in the M2D2 construction area. The dimensions of M2D2 are 60 feet wider and more than twice as deep as the existing dry dock. Dredging would primarily occur where the probability for the presence of archaeological resources is moderate (Stell 2013a; OVAI 2022). Fill deposits may contain archaeological resources moved from their original context, and construction activities that extend beyond the depth of fill would have a higher probability of encountering archaeological resources. Construction activities would follow the Navy's discovery plan.

Vibratory impacts to cultural resources from pile driving or other construction activities are not anticipated. Based on the Navy's experience in the ROI, vibration is unlikely to result in damage to nearby historic dry docks and masonry buildings in the NYPS NHL and PSNS Historic District. Industrial noise is common in shipyard operations at PSNS & IMF. Audible intrusions from construction activities would be temporary and would not impact cultural resources.

Operation-related Impacts

No operation-related impacts would occur to cultural resources. Operation of new facilities, although larger in scale and massing, would be consistent with the shipyard's historic functions. The Navy does not anticipate the need for any increase in maintenance dredging once the Proposed Action is complete; therefore, no operational impacts to underwater archaeological resources would occur.

Effects Associated with Reasonably Foreseeable Future Actionss

Effects from RFFAs would continue to influence the trajectory of cultural resource impacts, as described in Table 3.6-3 and Table 3.6-4.

RFFAs planned at NAVBASE Kitsap-Bremerton would demolish and alter historic properties that contribute to the NYPS NHL and PSNS Historic District. Ground disturbing activities from RFFAs planned at NAVBASE Kitsap-Bangor could impact archaeological resources if present. Adverse effects to historic properties from RFFAs would be resolved pursuant to Section 106.

3.6.3.5 Impact Analysis for Alternative 3

Impacts to cultural resources would be similar to those for Alternative 2. Pursuant to Section 106, adverse effects to historic properties would be resolved through consultation and implementation of the MOA; the Navy's post-review discovery plan would be implemented (Navy 2023).

Construction-related Impacts

Construction-related impacts to cultural resources would be similar to Alternative 2 but would involve the demolition of fewer historic properties. Impacts would diminish the integrity of the NYPS NHL, PSNS Historic District, and Officers' Row Historic District and result in adverse effects to historic properties pursuant to Section 106. Construction could damage or destroy previously unknown archaeological resources but would avoid known archaeological resources. Vibratory impacts to cultural resources and audible intrusions from construction activities would be the same as Alternative 2. No impacts would occur to known cultural resources at NAVBASE Kitsap-Bangor. A new forge shop would not be constructed. Construction activities to expand the mission support area (Radio Hill complex) would not impact known cultural resources.

Alternative 3 would demolish five historic properties, all of which contribute to the PSNS Historic District, with three of those properties also contributing to the NHL (Table 3.6-7, Figure 3.6-5). Two of the historic properties (Mooring A and Collimation Tower) would only be demolished under Alternative 3, while the rest would also be demolished under Alternative 2. Alternative 3 would reconfigure Wycoff Way, thus altering the historical circulation patterns of the PSNS Historic District (AECOM 2022).

Table 3.6-7 Historic Properties Demolished under Alternative 3

Facility Name	*NRHP Eligibility*	*Historical Significance and Presence in Historical Setting*
Storage Facility/Foundry	Contributing resource to NYPS NHL and PSNS Historic District	The Storage Facility/Foundry, built in 1912, is a Greek-Revival–inspired brick building that originally served as the shipyard foundry.
Pier 4	Contributing resource to NYPS NHL and PSNS Historic District	Built in 1914, Pier 4 is a precast concrete structure with an original gantry crane with its own track system and a substation (Electric Substation No. 4) built in 1924.
Hammerhead Crane	Contributing resource to NYPS NHL and PSNS Historic District	Hammerhead Crane, built in 1933, is an iconic steel structure at the south end of Pier 6.
Mooring A	Contributing resource to PSNS Historic District; Individually eligible	Mooring A, constructed in 1946, plays a significant role in supporting shipyard operations during the Cold War-era. The concrete pier with mooring dolphins is the berthing for inactive vessels.
Collimation Tower	Contributing resource to PSNS Historic District	Collimation Tower, built in 1964, is a steel tower of common angle-truss design.

Legend: NHL = National Historic Landmark; NRHP = National Register of Historic Places; NYPS = Navy Yard Puget Sound; PSNS = Puget Sound Naval Shipyard; WWII = World War II

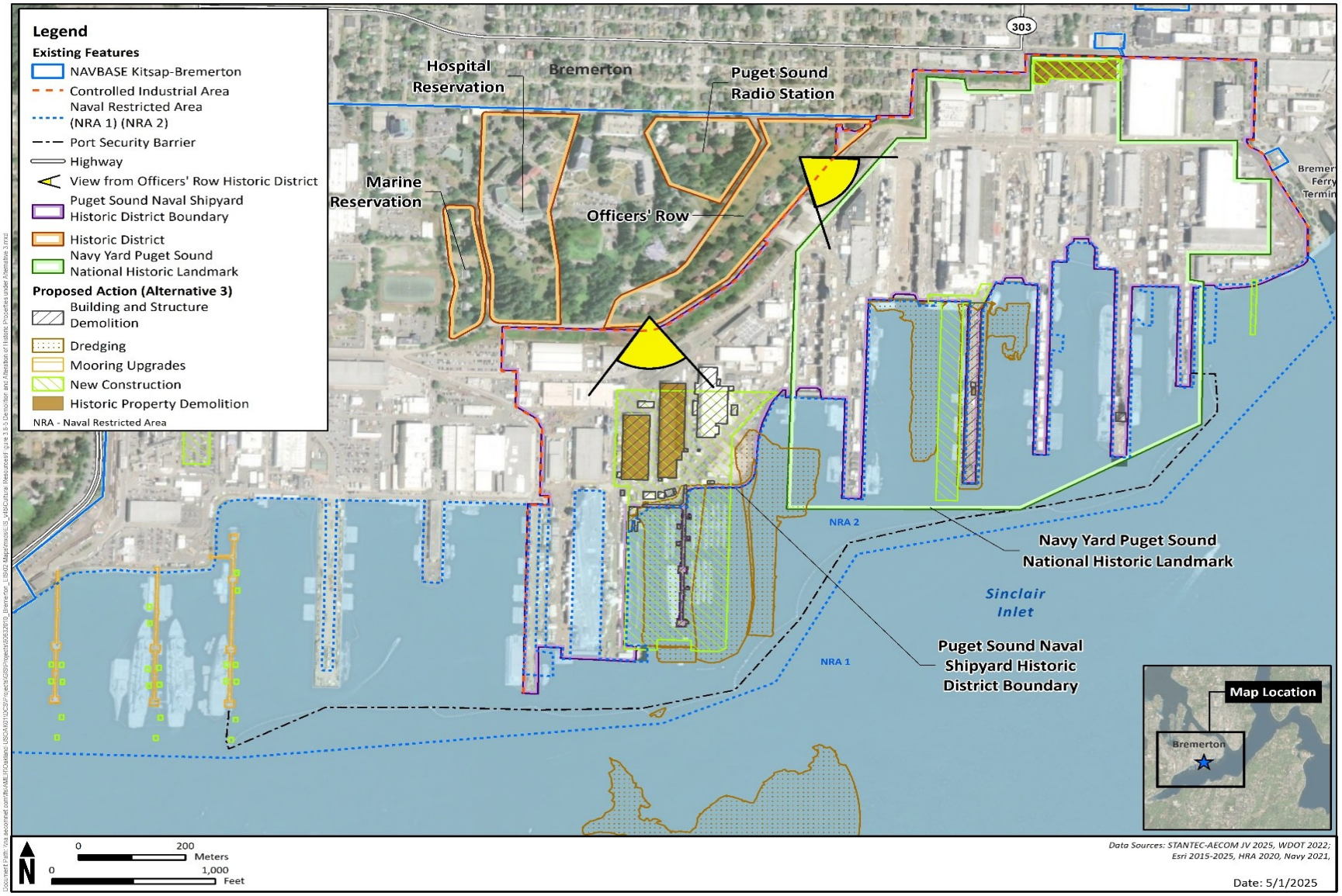

Figure 3.6-5 Demolition and Alteration of Historic Properties at NAVBASE Kitsap-Bremerton under Alternative 3

Alternative 3 would result in the permanent loss of historic buildings and structures from World War I, World War II, and Cold War eras that contribute to the PSNS Historic District and NYPS NHL. The loss of Mooring A and the relocation of the inactive nuclear fleet would diminish the integrity of setting, feeling and association with the Cold War-era that characterize the district, resulting in adverse effects pursuant to Section 106. The deconstruction and demolition would also alter historically intentional views from the Officers' Row Historic District of the shipyard's shoreline, historic buildings, and piers.

Modifications to the NRHP-eligible Moorings E, F, and G for the relocation of vessels from Mooring A would include installation of intermediate mooring buoys and anchors. The modifications would be consistent with the function and appearance of these historic structures, which were built in 1946; therefore, impacts would be negligible.

Alternative 3 would introduce new dominant visual elements within the PSNS Historic District, primarily centralized around the new M2D2 and Wharf 2 in the general vicinity of Mooring A. The replacement of Pier 4 with a new pier, and the new and large-scale M2D2, would be consistent with the shipyard's historic industrial and dynamic shoreline setting of multiple piers and moorings that characterize the PSNS Historic District and historically intentional views from the Officers' Row Historic District. Therefore, impacts from new construction would be negligible.

Impacts from materials storage and staging areas would be the same as Alternative 2. Use of laydown areas identified in Figure 2-5 would not impact cultural resources.

Impacts from dredging activities would be similar to Alternative 2. Dredging activities would primarily occur in areas with deep fill and with low to moderate probability for the presence of archaeological resources (Stell 2013a). Fill deposits may contain archaeological resources moved from their original context, and construction activities that extend beyond the depth of fill would have a higher probability of encountering archaeological resources. Construction activities would follow the Navy's discovery plan.

Operation-related Impacts

Operation-related impacts to cultural resources would be the same as Alternative 2 (no impacts).

Effects Associated with Reasonably Foreseeable Future Actions

Effects associated with reasonably foreseeable future actions would be the same as Alternative 2.

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3.7 American Indian Traditional Resources

This section analyzes potential impacts on American Indian traditional resources. For the purposes of this section, the term "traditional resources" encompasses protected Tribal resources, including Tribal trust resources. They also include those natural resources and properties of traditional or customary religious or cultural importance retained by or reserved for Indian Tribes through treaties, statutes, judicial decisions, or Executive Orders (EOs) as discussed in *DoD Instruction 4710.02 DoD Interactions with Federally Recognized Tribes* (DoDI 4710.02). Tribal trust resources include Indian lands and treaty-protected resources. Treaty-protected resources include plants, animals, and locations associated with hunting and fishing activities for subsistence or ceremonial use. Specifically, this section analyzes potential impacts to the availability and harvestability of traditional resources and potential interference with Tribal fishing and harvesting activities, including Tribal access to usual and accustomed (U&A) fishing grounds and stations. Treaty-protected rights to use and access natural and cultural resources are a vital part of Tribal life and are of deep cultural, economic, and subsistence importance to Tribes (United States [U.S.] Department of the Interior 2021). Many treaties protect not only the right to access natural resources, such as fisheries, but also protect the resource itself from significant degradation (U.S. Department of the Interior 2021). Tribal Nations entered into treaties, in part, to protect their way of life and inherent rights to natural resources of cultural, economic, and subsistence importance. The DoD and 16 other federal agencies have formally committed to consider and protect Tribal treaty rights in agency policymaking and regulatory processes (Advisory Council on Historic Preservation et al. 2021).

3.7.1 Regulatory Setting

The legal relationship between the United States and tribes is established in the United States Constitution within the context of commerce and treatymaking (United States Constitution: Article I, Section 8 & Article II, Section 2). This relationship was subsequently interpreted by United States federal courts as affirming tribal sovereignty in the early nineteenth century through three U.S. Supreme Court decisions. The history of Indian law in the United States begins with the Marshall Trilogy—*Johnson v. McIntosh*, 21 U.S. 543 (1823); *Cherokee Nation v. Georgia*, 30 U.S. 1 (1831); and *Worcester v. Georgia*, 31 U.S. 515 (1832). These three decisions, primarily authored by Chief Justice of the U.S. Supreme Court John Marshall, established federal primacy in Indian affairs, excluded state law from Indian country, and recognized Tribal governance authority. Over the course of nearly two centuries since, federal Indian law (also referred to as "the trust doctrine") has been at the center of numerous Supreme Court cases. As a foundational legal principle, the trust doctrine understands that federally recognized Tribes are

separate and distinct nations with sovereignty over lands retained; treaties with Tribes were intended to ensure availability of a sustainable, land-based, traditional existence. Tribes retain everything they did not expressly cede to the United States; and the federal government has a fiduciary duty to the Tribes in consideration for the concessions made in treaties and in fulfillment of understandings and expectations that have arisen over the course of the relationship between the United States and federally recognized Tribes.

The trust responsibility has been interpreted by the courts to require federal agencies, including the DoD, to carry out their activities in a manner that is protective of treaty rights. EO 13175, *Consultation and Coordination with Indian Tribal Governments*, affirms the trust responsibility of the United States and directs agencies to respect Tribal sovereignty. The DoD and other federal agencies are signatories to the *Memorandum of Understanding Regarding Interagency Coordination and Collaboration for the Protection of Tribal Treaty and Reserved Rights,* which affirms their commitment to protect Tribal treaty rights, reserved rights, and similar Tribal rights to natural and cultural resources, and to fully implement federal government treaty obligations (Advisory Council on Historic Preservation et al. 2021). The U.S. Department of the Navy (Navy) is also in compliance with the Presidential Memorandum of January 26, 2021, *Tribal Consultation and Strengthening Nation-to-Nation Relationships*. The Plan of Action, a requirement of the Memorandum, to implement the policies and directives of EO 13175 was prepared and submitted by the Office of the Secretary of Defense. The Navy follows the Plan of Action as well as the Presidential Memorandum of December 5, 2022, *Uniform Standards for Tribal Consultation.*

The Navy must consult with Tribes when proposing an action that may have the potential to significantly affect protected Tribal resources, Tribal rights, or Indian lands. The Navy will continue government-to-government consultation in accordance with Secretary of the Navy Instruction 11010.14B, *Department of the Navy Policy for Consultation with Federally Recognized Indian Tribes, Alaska Native Tribal Entities, and Native Hawaiian Organizations*; *Memorandum for Deputy Chief of Naval Operations Installations and Logistics (N4) Deputy Commandant of the Marine Corps Installations and Logistics, Subj: Establishment of the Department of Navy Tribal Liaison Program Supplemental Tribal Nation Consultation Standards and Best Practices* (January 17, 2025); Commander, Navy Region Northwest Instruction 11010.14B, *Policy for Consultation with Federally Recognized American Indian and Alaska Native Tribes* (May 14, 2025); EO 13175, *Consultation and Coordination with Indian Tribal Governments*; EO 13007, *Indian Sacred Sites*; the Presidential Memorandum dated April 29, 1994, *Government-to-Government Relations with Native American Governments*; the National Historic Preservation Act of 1966 as amended in 2006; the American Indian Religious Freedom Act of 1978; Navy consultation policies as needed; the Presidential Memorandum of January 26, 2021, *Tribal Consultation and Strengthening Nation-to-Nation Relationships*, as well as the Presidential Memorandum of December 5, 2022, *Uniform Standards for Tribal Consultation, DoD American Indian and Alaska Native Policy* (as amended in 1999), and DoD Instruction 4710.02, *DoD Interactions with Federally Recognized Tribes*, which implements this policy (September 24, 2018); and Secretary of the Navy Instruction 11010.14B, *Department of the Navy Policy for Consultation with Federally Recognized Indian Tribes, Alaska Native Tribal Entities, and Native Hawaiian Organizations* (January 18, 2019).

Table 3.7-1 provides a list of the existing regulatory setting for American Indian traditional resources at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, Washington. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.7-1 Regulatory Setting for American Indian Traditional Resources

Law, Regulation, or Guidance	*Applicable Citation*
Federal	
Articles of the U.S. Constitution	U.S. Constitution (1787)
Treaty of Point Elliott, Treaty of Point No Point	Treaty of Point Elliott (1855), Treaty of Point No Point (1855)
Government-to-Government Relations with Native American Governments	Presidential Memorandum, April 29, 1994
EO 13175, *Consultation and Coordination with Indian Tribal Governments*	65 FR 67249; November 6, 2000
Tribal Consultation and Strengthening Nation-to-Nation Relationships	Presidential Memorandum, January 26, 2021
DoD American Indian and Alaska Native Policy (as amended in 1999), DoD Interactions with Federally Recognized Tribes, which implements this policy	DoD Instruction 4710.02, September 24, 2018
Department of the Navy Policy for Consultation with Federally Recognized Indian Tribes, Alaska Native Tribal Entities, and Native Hawaiian Organizations	Secretary of the Navy Instruction 11010.14B, January 18, 2019
Policy for Consultation with Federally Recognized American Indian and Alaska Native Tribes	Commander, Navy Region Northwest Instruction 11010.14B, May 14, 2025
Establishment of the Department of Navy Tribal Liaison Program Supplemental Tribal Nation Consultation Standards and Best Practices	Memorandum for Deputy Chief of Naval Operations Installations and Logistics (N4) Deputy Commandant of the Marine Corps Installations and Logistics, January 17, 2025

Legend: DoD = Department of Defense; EO = Executive Order; FR = Federal Register; Navy = U.S. Department of the Navy; U.S. = United States

The Navy regularly consults with federally-recognized Tribal Nations that are historically or culturally affiliated with the installation lands.

3.7.2 Affected Environment

The Region of Influence (ROI) for American Indian traditional resources includes the project footprint, Sinclair Inlet, and adjacent shoreline for activities at NAVBASE Kitsap-Bremerton; the project footprint, surrounding lands, and Hood Canal for activities at NAVBASE Kitsap-Bangor; and project marine vessel routes (Figure 3.7-1).

3.7.2.1 Existing Conditions

The Suquamish Indian Tribe of the Port Madison Reservation (Suquamish Tribe), Skokomish Indian Tribe (Skokomish Tribe), Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, Lower Elwha Tribal Community (Lower Elwha Klallam Tribe), Lummi Nation, Muckleshoot Indian Tribe, Puyallup Tribe, Makah Indian Tribe, Hoh Indian Tribe, Quileute Tribe, Quinault Indian Nation, Swinomish Indian Tribal Community, and Tulalip Tribes have treaty rights and use traditional resources within the ROI. Ancestors of these Tribes fished, hunted, and gathered resources in harmony with the lands and waterways along Washington's Central Puget Sound region. They lived in winter villages and seasonal home sites and harvested marine and game resources from Sinclair Inlet and Hood Canal and surrounding uplands; their descendants continue these activities in the same region today.

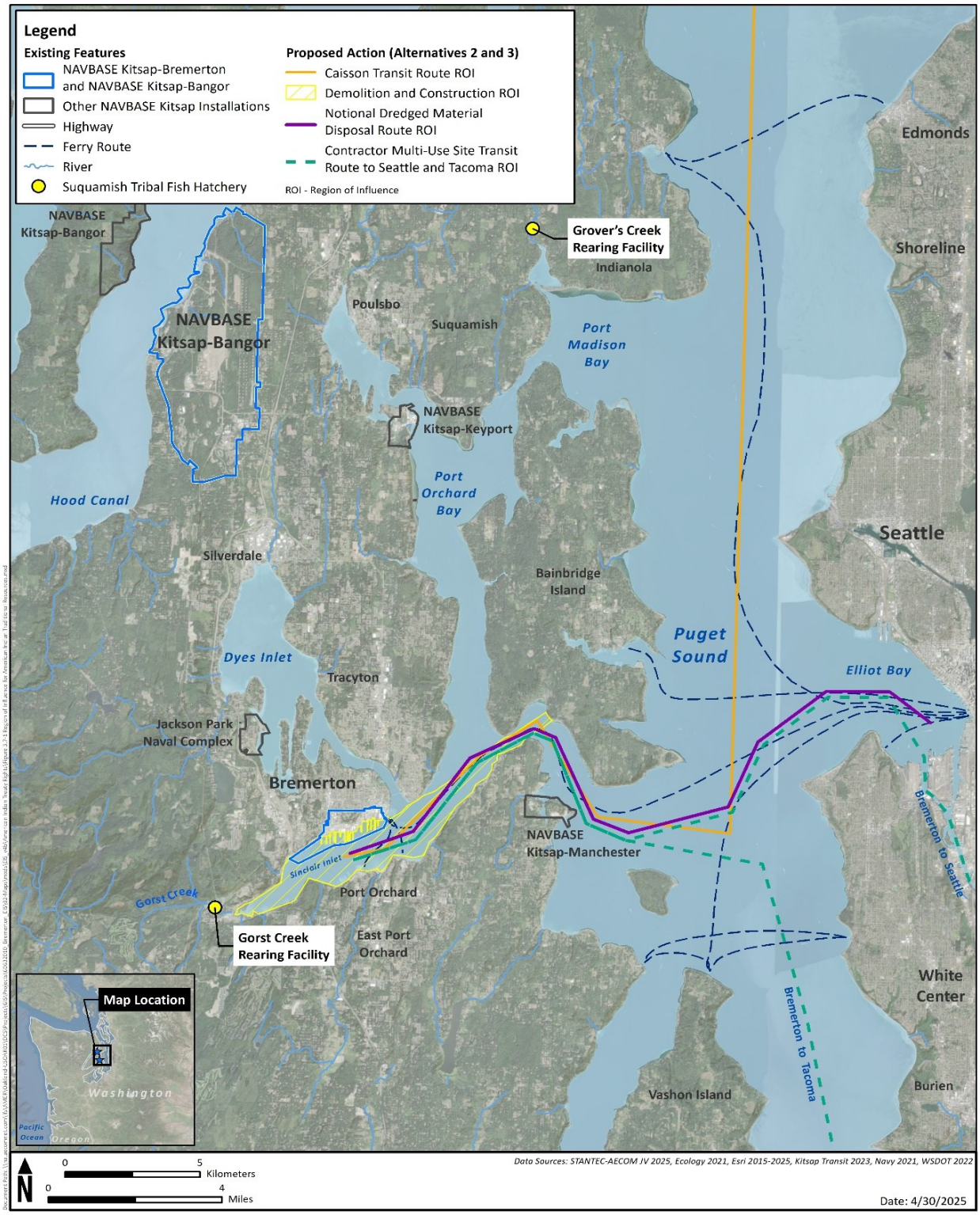

Figure 3.7-1 Bremerton Waterfront Infrastructure Project ROI for American Indian Traditional Resources

Since time immemorial, the Tribes have passed down cultural traditions involving natural resources such as water, soil, plants, and animals from one generation to the next. Ethnographic and archaeological evidence demonstrates that ancestral Tribal peoples lived, hunted, and fished at Sinclair Inlet, Hood Canal, and surrounding areas (Lane 1974). There are numerous traditional place names within the ROI including *Cte'lqub* for the area now occupied by NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor; there are also names that refer to places at Sinclair Inlet associated with natural resources such as snails, jellyfish, sea cucumber, beach worms, cormorants, and others (Hilbert et al. 2001: 205-218; Lane 1974). Language in treaties and other federal laws securing off-reservation fishing and hunting rights has been construed as preserving aboriginal rights that Indians traditionally exercised before the treaties were executed. Treaty fishing and hunting clauses are not a "grant of rights (from the federal government to the Indians), but a grant of rights from them—a reservation of those not granted" (United States v. Winans, 25 S. Ct. 662, [1905]). This means that the Tribes retain rights not specifically surrendered to the United States.

Many Puget Sound Tribes signed treaties with the United States, including the Point Elliott Treaty of 1855 (Suquamish Tribe and others), Treaty of Point No Point of 1855 (Skokomish Tribe, Lower Elwha Klallam Tribe, Port Gamble S'Klallam Tribe, and Jamestown S'Klallam Tribe) (Kitsap County 2015; Washington Department of Fish and Wildlife 2022). In these treaties, the Tribes ceded lands to the United States while reserving rights to take fish and shellfish and to hunt and gather at off-reservation U&A areas. These treaties also reserved tracts for the Tribes.

Sinclair Inlet and NAVBASE Kitsap-Bremerton are within the adjudicated U&A fishing grounds and stations of the Suquamish Tribe 459 F. Supp 1020, United States v. State of Washington, U.S. District Court for the Western District of Washington 1978). The Tribe exercises their treaty-reserved rights to fish and harvest shellfish for personal subsistence, ceremonial, and commercial use (Suquamish Tribe 2021a). However, shellfish harvesting is currently prohibited in Sinclair Inlet, and fish consumption is regulated due to human health risks (Washington State Department of Health 2021).

NAVBASE Kitsap-Bangor is within the U&A fishing grounds and stations of the Suquamish Tribe, Skokomish Tribe, Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe (Kitsap County 2015). These Tribes exercise their treaty-reserved rights to hunt, fish, and gather, and co-manage, with the State, treaty protected resources in their U&A areas, which include Hood Canal and areas of NAVBASE Kitsap-Bangor (Northwest Treaty Tribes 2019; Jamestown S'Klallam Tribe 2022; Lower Elwha Klallam Tribe 2022; Port Gamble S'Klallam Tribe 2022; Skokomish Tribe 2022a, 2022b; Suquamish Tribe 2021a; Washington Department of Fish and Wildlife 2022). Along the marine vessel and caisson route through Puget Sound, the Swinomish Indian Tribal Community and Tulalip Tribes also retain U&A fishing grounds.

Remedial investigations have documented sediment contamination within Sinclair Inlet including at the Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) from former industrial activities at the historical naval installation (Navy et al. 2000). PSNS & IMF is the location of the Proposed Action at NAVBASE Kitsap-Bremerton and within the ROI for American Indian traditional resources (see Figure 3.7-1). The Navy, in cooperation with U.S. Environmental Protection Agency and Ecology, carried out remedial actions to address contaminated sediment offshore of NAVBASE Kitsap-Bremerton in accordance with a Record of Decision issued under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Navy et al. 2000). The National Priorities List identifies the site as the Puget Sound Naval Shipyard Superfund Site, with both upland and marine operable units (OUs), which are areas designated for remedial response to address contamination. OU B

included terrestrial and marine areas. The marine portion of OU B (OU B Marine), which contained contaminated sediment, consisted of approximately 230 acres of subtidal land. Levels of contaminants measured in the tissues of bottom-dwelling fish, which U.S. Environmental Protection Agency identified as posing an unacceptable risk to subsistence seafood consumers, was the primary reason for cleanup of OU B Marine. The area designated for remedial action under CERCLA extended up to 1,500 feet offshore from the terrestrial portions of NAVBASE Kitsap-Bremerton at depths up to approximately 40 feet below mean lower low water (Navy et al. 2000) (Figure 3.4-4). The Navy implemented the main elements of the OU B Marine remedy (Figure 3.45) in 2000 and 2001.

Contamination and resource depletion is harmful to Tribes not only because of socioeconomic impacts, but also because treaty protected resources and traditional lifeways are tied to the health of the water and natural resources (Wood 2003). Contamination affects the ability of Tribes to raise children in their traditional ways and to pass along traditional ecological knowledge and disrupts connection to the land and ability to live off its resources (Bienkowski 2012).

Government-to-Government Consultation

In November 2017, the Navy began discussions with the Suquamish Tribe regarding a proposed new dry dock at PSNS & IMF. The Suquamish Tribe initiated government-to-government consultation on March 27, 2019, in compliance with EO 13175, DoD policy (4710.02), and Secretary of the Navy Instruction (Secretary of the Navy Instruction 11010.14B and Commander, Navy Region Northwest Instruction 11010.14B), about potential impacts to American Indian traditional resources resulting from the Proposed Action. Through the Navy's ongoing consultation meetings, the Suquamish Tribe has identified the concerns and priorities during meetings and in written correspondence. The Navy introduced the project during consultation meetings in 2022 and 2023 with the Skokomish Indian Tribe, Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, and Port Gamble S'Klallam Tribe. The Navy has ongoing consultation with the affected Tribes and would continue to carefully consider and evaluate information on traditional resources or access to those resources based on further input from tribal governments.

Known Tribal Concerns and Priorities

The Suquamish Tribe's expressed concerns and priorities for the Proposed Action are: (1) ensuring availability and harvestability of fish and shellfish, including improvements to their aquatic habitat through removing contaminated sediment and improving water quality; and (2) avoiding potential interference with Tribal fishing, including maintaining Tribal access to U&A fishing grounds and stations.

Availability and Harvestability of Fish and Shellfish in the Region of Influence

Numerous fish species are present within the ROI, which includes Sinclair Inlet, and adjacent shoreline for activities at NAVBASE Kitsap-Bremerton; and the project footprint, surrounding lands, and Hood Canal for activities at NAVBASE Kitsap-Bangor (Section 3.5). Finfish species of cultural importance include salmon (Chinook, coho, chum, sockeye, and pink), halibut, herring, smelt, rockfishes, flounders, and others (Suquamish Tribe 2021a). Common shellfish species at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor include various clams, crabs, mussels, limpets, barnacles, cockle, and geoduck (Navy 2018). Clams, geoduck, crab, and shrimp exemplify some of the Tribe's culturally important species (Suquamish Tribe 2021b).

Sinclair Inlet provides Pacific coast salmon Essential Fish Habitat (PFMC 2014). Salmon primarily use Sinclair Inlet as a migration corridor, migrating out as juveniles and returning as adults to spawn in

tributary streams (Fresh et al. 2006). Marine vegetation at NAVBASE Kitsap-Bremerton is limited to macroalgae sea lettuce, although some seagrasses (i.e., eelgrass), which are important rearing habitat for fishes (Rubin et al. 2018), occur in the larger ROI. See Section 3.5 for further information.

Tribes with U&A areas have the right to take their fair share of harvestable finfish and shellfish in their U&A fishing grounds and stations. Tribes maintain Fisheries Departments and Shellfish Programs to co-manage their traditional resources with the State of Washington. The Suquamish Tribe has U&A within Sinclair Inlet. Tribal harvest regulations ensure resource conservation and habitat protection (Suquamish Tribe 2021b). The Suquamish Tribe manages the Gorst Creek Rearing Facility in the upper reaches of Sinclair Inlet while the City of Bremerton owns the property (see Figure 3.7-1). The Gorst Creek Rearing Facility annually releases about 2.1 million sub-yearling Chinook and Coho smolts into Gorst Creek (NMFS 2014; Suquamish Tribe 2021c). The Suquamish Tribe also manages the Grovers Creek Hatchery, a Chinook and chum salmon hatchery north of Sinclair Inlet at Port Madison Bay (Figure 3.7-1). Both hatcheries are affected by impaired water quality, in part due to contaminants found in stormwater runoff (Suquamish Tribe 2021c; Mid Sound Fisheries Enhancement Group 2022).

Historical and current releases of hazardous substances and pathogens into the environment are a concern, as these accumulate in the sediment and biota, which leads to poor fish and shellfish health, unacceptable human health risks, and fishery closures (Suquamish Tribe 2021b). The Suquamish Tribe's resource management goals include reopening treaty-reserved resource areas that have been closed to fishing and shellfish harvesting due to human health concerns, protecting access to Tribal fishing grounds and stations, restoring habitat, and preventing environmental degradation (Suquamish Tribe 2021d). Continued consultation with the Suquamish Tribe will provide more detail about the potential impacts to salmon enhancement, habitat, water quality, and fishing access.

Interference with Tribal Fishing

The Suquamish Tribe is concerned about increased vessel traffic, in-water work, temporary moorings, and other construction elements of the Proposed Action at NAVBASE Kitsap-Bremerton that could interfere with Tribal fishing. Tribal members rely on fishing for their diet, for use in cultural ceremonies, and as a source of income for Tribal families (Suquamish Tribe 2021c). Tribal fishing methods include use of set lines, pots, troll lines, gill nets, beach seines, setnets, roller trawls, hand lines, and others (Suquamish Tribe 2020).

Tribal fishing windows occur at different seasons throughout the year depending on the species. For example, Chinook salmon return annually during the months of September and October, while by November, more of the returning fish are chum salmon (Suquamish Tribe 2021e). The Suquamish Tribe releases millions of sub-yearling smolts from the Gorst Creek Rearing Facility during the months of May and June, and Tribal members fish in Sinclair Inlet for hatchery salmon as they return to Gorst Creek in the fall (National Marine Fisheries Service 2014; Suquamish Tribe 2021c). Tribal fishers frequently fish toward the less developed western end of NAVBASE Kitsap-Bremerton.

Temporary moorings may decrease the size of the fishing grounds available to Suquamish Tribe fishers and will increase the potential hazards to their gear and safety. There will be increased potential for negative gear interactions and lost nets due to snagging on anchors, chains/cables, and/or buoys. There is also an increase in safety hazards to vessels and fishers as gear snags can result in physical injuries to works on deck, and/or damage to the vessel.

Potential increases in vessel traffic are a concern for the Tribe because it could interfere with Tribal fishing. NAVBASE Kitsap-Bremerton has a waterfront PSB that the Navy established to protect naval

vessels (see Figure 3.7-1). If the area of the PSB were to be enlarged, this would affect Tribal access to U&A areas. The PSB may be relocated temporarily within the port security area during construction. The Navy would modify some PSB buoys and anchors in the vicinity of the new M2D2. The PSB would not extend farther south than the current PSB alignment and the area within the PSB would not increase.

Tribes, such as the Skokomish Indian Tribe, Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, Port Gamble S'Klallam Tribe, and Suquamish Tribe, that access NAVBASE Kitsap-Bangor for Tribal harvesting practices are concerned that construction-related activities will directly affect traditional resources located in or near the Hood Canal and Dabob Bay. Concerns include water quality, sediment transport from upland construction downstream to Devil's Hole, and impacts to the Tribal shellfish beach. These Tribes historically have gathered, and currently gather, resources from forested areas at the installation, including cedar bark and other plant materials (Dunn et al. 2021), and any changes to access to or reduction of habitat of traditional resources would be a concern. Additional Navy consultation with the Skokomish Indian Tribe, Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, Port Gamble S'Klallam Tribe, and Suquamish Tribe about the Proposed Action components at NAVBASE Kitsap-Bangor is underway.

3.7.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Table 3.7-2 and Table 3.7-3 summarize the potential effects to American Indian traditional resources associated with reasonably foreseeable future actions (RFFAs) with a close causal relationship to the Proposed Action.

Table 3.7-2 Effects to American Indian Traditional Resources from Reasonably Foreseeable Future Actions at NAVBASE KitsapBremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Pier 3 Electrical Substation Repair, PSNS & IMF	Located within NAVBASE Kitsap-Bremerton Proposed Action area at DD4 and Pier 3.	Not applicable. No reasonably close causal relationship to American Indian traditional resources identified.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF, and NAVBASE Kitsap-Manchester	Located within NAVBASE Kitsap-Bremerton Proposed Action area at Piers 4 and 5, Mooring A, and DD5.	Removal and installation of piles over a 5-year period would include similar in-water work that could influence fish and aquatic habitat, increase noise levels, and increase vessel traffic during construction. There could be a brief overlap with Proposed Action construction activities, but this project is scheduled to be complete in 2025, and the Proposed Action is slated to begin in 2026.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	Located outside NAVBASE Kitsap-Bremerton Proposed Action area at NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	Not applicable. No reasonably close causal relationship to American Indian traditional resources identified.
Navy – SIOP, PSNS & IMF	Located within NAVBASE Kitsap-Bremerton Proposed Action area piers, dry docks, shoreline.	Some SIOP projects could overlap with the Proposed Action. Capital improvements in and over water could affect fish and aquatic habitat and increase noise and vessel traffic; impacts would be minimized through BMPs.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Operable Unit B Marine Source Removal Actions	Located within NAVBASE Kitsap-Bremerton Proposed Action area in-water.	Project would involve remediation of contaminated sediment which would be beneficial to traditional resources. There could be an overall increase in vessel traffic if work occurs simultaneously with the Proposed Action. Upland source control and in-water work are anticipated to begin in 2029.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	Not applicable. No reasonably close causal relationship to American Indian traditional resources identified.
Navy – Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	Located within NAVBASE Kitsap-Bremerton Proposed Action area	Not applicable. No reasonably close causal relationship to American Indian traditional resources identified.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	Located outside NAVBASE Kitsap-Bremerton Proposed Action area.	Not applicable. No reasonably close causal relationship to American Indian traditional resources identified.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Located outside NAVBASE Kitsap-Bremerton Proposed Action area.	Not applicable. No reasonably close causal relationship to American Indian traditional resources identified.
City of Bremerton – Marina Breakwater Replacement, Port Orchard Marina	Located outside NAVBASE Kitsap-Bremerton Proposed Action area.	Not applicable. No reasonably close causal relationship to American Indian traditional resources identified.
Private Development – McWilliams Apartments	Located outside NAVBASE Kitsap-Bremerton Proposed Action area.	Not applicable. No reasonably close causal relationship to American Indian traditional resources identified.
Private Development – The Beacon and Beacon II	Located outside NAVBASE Kitsap-Bremerton Proposed Action Area	Not applicable. No reasonably close causal relationship to American Indian traditional resources identified.

Legend: BMP = best management practice; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; DD = dry dock; NSC = Naval Supply Center; NAVBASE = Naval Base; MILCON = Military Construction; PFAS = per- and polyfluoroalkyl substances; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; SIOP = Shipyard Infrastructure Optimization Program

Table 3.7-3 Effects to American Indian Traditional Resources from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Transit Protection Program Support Facilities	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Likely not applicable.
Navy – Child Development Center	Located within NAVBASE Kitsap-Bangor Proposed ROI.	Demolition and construction would occur near the proposed laydown area, and would include clearing trees, which could reduce the amount of forest land available for Tribal harvest. The project is scheduled from 2024 through 2029.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Military Working Dog Kennel Replacement	Located within NAVBASE Kitsap-Bangor Proposed ROI.	Demolition and construction would occur near the proposed forge shop location, creating airborne noise and visual disturbance which could impact Tribal gathering in forested areas. Project is set to begin in 2025.
Navy – Repair Substation 5	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. Project actions consistent with current land use.
Navy – Tang Road Repair	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. Project actions consistent with current land use.
Navy – Equipment Processing Building	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. Project actions consistent with current land use.
Navy – Relocate Flier Road	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. Project actions consistent with current land use.
Navy – CERCLA Actions for PFAS	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. Project actions consistent with current land use.
Navy – CERCLA Operable Unit 1 Site A	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. Project actions consistent with current land use.
Navy – CERCLA Operable Unit 2 Site F	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. Project actions consistent with current land use.
Navy – Alternate Power Transmission Line	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	Not applicable. Project actions consistent with current land use.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; PFAS = per- and polyfluoroalkyl substances; ROI = Region of Influence; UXO = unexploded ordnance

3.7.3 Environmental Consequences

The analysis presented in this section addresses potential impacts to treaty-protected Tribal resources and to Tribal fishing practices resulting from construction activities and ongoing operations associated with the Proposed Action.

3.7.3.1 Nature and Type of Effects

The nature and type of effects on traditional resources include those that could alter the availability and harvestability of fish and shellfish and those that could interfere with Tribal fishing practices. The analysis evaluates the potential beneficial or adverse impacts on traditional resources so that adverse effects identified may be addressed and mitigated where possible through implementation of appropriate Best Management Practices (BMPs), as listed in Appendix A. BMPs are measures that the Navy implements to reduce the environmental impacts of designated activities, functions, or processes.

Changes in the Availability and Harvestability of Fish and Shellfish

The availability and harvestability (viability) of treaty protected resources are a concern for Tribes. The Proposed Action could adversely impact the availability and harvestability of fish and shellfish (benthic invertebrates) if it results in the following:

- A measurable reduction in a population or stock due to injury or mortality or a decline in water quality and habitat.
- Increased levels of bioaccumulated contaminants in fish or shellfish.
- Avoidance or alteration of U&A fishing grounds and stations by migratory species in response to disturbances.

A decrease in water quality from current conditions in Sinclair Inlet or a decrease in the quality of fish and shellfish habitat could reduce the availability and harvestability of traditional resources.

A loss of harvest could also occur if fish and shellfish alter their behavior due to disturbances in the environment from the Proposed Action, such as noise and vibration, water turbidity, and new overwater shade. Mortality or injury to a juvenile fish population caused by the Proposed Action could lead to reduced availability of fish for present and future Tribal harvest.

Potential impacts could include damage to or destruction of traditional resources, which may present a long-term to permanent impact. Impacts to harvestability or availability of fish or shellfish could occur if the Proposed Action results in an overall increase in contaminants released into Sinclair Inlet or in the spread of contaminants into areas not previously contaminated. The presence of contaminants affects the ability of present and future Tribal generations to harvest traditional resources and to practice traditional lifeways as well as exercise adjudicated treaty rights. Conversely, there would be beneficial effects if the Proposed Action results in long-term improvement to water quality and sediment quality from removal of contaminated sediment, increased quantity and quality of traditional resources, and/or increase in the area and quality of aquatic habitat.

Interference with Tribal Fishing

The Tribes and the Navy depend upon co-use of navigable waterways within the ROI and have interests in sustainable use of these waters. The Suquamish Tribe has U&A fishing grounds and stations within Sinclair Inlet. Construction of the Proposed Action would occur over a number of years and could interfere with Tribal fishing if the timing of certain in-water activities overlaps with a fishing season window, resulting in loss of harvest for that season and potential loss of knowledge transfer to younger generations of fishers. Noise during construction could also interfere with Tribal fishing and harvesting activities as noise may affect the presence of fish species. Tribal fishermen may have to move their vessels, nets, or fishing gear to avoid vessel traffic associated with the Proposed Action. A vessel's wake can also pose a risk to Suquamish Tribe divers. The Proposed Action could interfere with Tribal fishing if Tribal access to U&A fishing grounds and stations is prevented or delayed, if fishing gear is damaged or lost, or if the fishers spend time moving to alternative locations. Potential impacts to Tribal fishing would be clarified in ongoing government-to-government consultation.

3.7.3.2 Impact Assessment Methodology

The evaluation of construction-related and operation-related impacts on traditional resources considers how each alternative potentially impacts the availability and harvestability of traditional resources and Tribal fishing activities. The impacts could be temporary or permanent. The impacts analysis includes Tribal issues and concerns raised as part of the consultation between the Navy and Suquamish Tribe to date. Government-to-government consultation with Tribes is ongoing, and impacts assessment would be clarified and updated in the Final EIS according to the results of consultation.

This EIS presents the Navy's analysis of potential impacts on the environment and resources harvested by Tribes in the following sections: Sections 3.3 (Water Resources), 3.4 (Geological Resources), and 3.5 (Biological Resources) discuss potential impacts to physical and biological resources; Section 3.10 Noise discusses the potential impacts of construction-related noise; and Section 3.13 discusses potential impacts of maritime traffic, including recreational and fishing vessels. Appendix A describes the protective measures (BMPs) to be implemented by the Navy within the ROI. Many of these measures would minimize impacts to species harvested by Tribes and their habitat. A table of the applicable BMPs are not included in this section but are specifically cited in the following sections.

3.7.3.3 Impact Analysis for Alternative 1: No-Action

Under the no-action alternative, the Navy would not address deficiencies in dry dock capacity, capability, and survivability. The Navy would continue to maintain, repair, and operate existing facilities. The combination of the no-action alternative and RFFAs (Tables 3.7-2 and 3.7-3), which would continue under the no-action alternative, could potentially influence traditional resources beneficially (e.g., remediation of contaminated sediment and improvements in water quality) as well as negatively (e.g., increase in vessel traffic and noise during construction), thereby resulting in an overall negative impact upon traditional resources.

3.7.3.4 Impacts Analysis for Alternative 2 (Preferred Alternative)

Under Alternative 2, the Navy would construct a new forge shop and expanded mission support area (Radio Hill complex) at NAVBASE Kitsap-Bangor. The Navy would demolish Piers 4, 6 (including the Hammerhead Crane), and 7 as well as upland buildings. A new Pier 2 would be constructed and Pier 4 would be replaced with a new pier. The Navy would demolish and replace the existing storage facility with a shipyard support building. The Navy would also demolish and replace the shipfitter-welder shop. Navy would remove select pile foundations from former Pier 8 and dredge the bottom sediment to create adequate draft at wharves and piers.

Under Alternative 2, traditional resources would be impacted by the loss of benthic invertebrates due to dredging and fill construction activities conducted over a combined area for dredging, temporary fill, and permanent fill. Dredging would impact aquatic vegetation, and construction would result in a net increase of overwater coverage and impervious surface area. Under Alternative 2, traditional resources would benefit from removal of creosote-treated pilings and contaminated sediment. These actions would improve localized water and surface sediment quality.

Under Alternative 2, there would also be an increase in intermittent noise from construction activities during the construction period for an estimated 14 years. Potentially disruptive noise associated with in-water work would occur during the removal and installation of piles.

Upland

The Navy would demolish the forge shop at NAVBASE Kitsap-Bremerton and build a new forge shop and expand the Radio Hill complex at NAVBASE Kitsap-Bangor under Alternative 2. The new forge shop would be built on an undeveloped, forested site. Impacts to protected Tribal resources could occur in forested areas accessed by Tribes for harvesting cedar bark and other plant materials, thus reducing U&A resource gathering areas. New areas of impervious surface could also impact surface water runoff. Impacts to American Indian traditional resources, including those resulting from increased runoff, is included in ongoing consultation with Tribes, and would be updated in the Final EIS.

Construction-related Impacts

Changes in the Availability and Harvestability of Fish and Shellfish

Construction activities have the potential to impact fish and shellfish, their food sources, and their habitat. Tribal resources may also be impacted by construction activities that impact water quality and expose resources to contaminated sediment.

To address the potential impacts of construction, BMPs that limit in-water work associated with contaminated sediment and water quality would be implemented. This could reduce potential impacts to traditional resources but would not reduce them to negligible levels. There would be construction-

related impacts to traditional resources, particularly to fish, shellfish, and habitat, and long-term benefits associated with removal of contaminated sediment and treated timber pilings.

Fish, Shellfish, and Habitat

The Suquamish Tribe fishes, harvests, and manages fish rearing facility operations in Sinclair Inlet. The Tribe is working to restore the inlet's degraded aquatic habitat. The construction of M2D2, regardless of location, would impact fish and shellfish and their habitat as a result of the following:

- Permanent removal of Essential Fish Habitat and aquatic vegetation within dredging and in-water construction footprints
- Loss or reduction of aquatic habitat due to increased overwater coverage
- Impacts (e.g., injury and altered behavior) to forage fish and to juvenile and adult life stage salmonids from underwater noise exposure, in-water construction, and vessel activity

Construction activities would take place over a period of more than 14 years. In-water activities, such as dredging, pile removal, pile driving, and demolition, which would increase noise and turbidity, would occur intermittently, during the course of construction in localized construction areas. BMPs would be implemented to limit noise exposure.

Smolt from natural production, smolt from the Gorst Creek Rearing Facility, and adult fish that make their return through Sinclair Inlet could be affected by the construction noise, vessel operations (including propwash), increased turbidity, and other construction-related impacts. Natural production of salmonids occurs in Gorst Creek and other tributaries to Sinclair Inlet. Naturally produced salmonids are often smaller than fish released from rearing facilities and thus more dependent on shallow intertidal habitat upon marine entry. To minimize impacts to juvenile salmonids, BMPs would limit in-water work to an in-water work window when juveniles are presumably not present in the area (see Chapter 2 for a more detailed description of the in-water work window).

Fish and habitat could be exposed to suspended sediment, including potentially contaminated sediment released during dredging and pile driving and extraction. With the implementation of applicable BMPs and Navy compliance with permit requirements, high levels of suspended material would not be anticipated. Long-term benefits to forage fish and habitat would occur after removal of contaminated sediment and treated timber pilings.

Alternative 2 would result in physical damage to, or loss of, benthic habitat. As a result of the Proposed Action, there could be a change in the species composition of invertebrate populations, with an increase in species that occur on human-made structures and a decline in benthic species that occur in soft-bottom habitats. Other long-term changes to habitat could also affect species composition in the affected areas. Construction actions would remove or bury vegetation with sediment. Loss of marine vegetation in the project area, consisting of macroalgae, would be long-term and localized in areas of fill, areas of permanent overwater shading, and areas where dredging reaches water depths (generally greater than 30 feet) that are incapable of supporting marine vegetation.

The increased presence of ships and propwash associated with vessel movements could affect fish and invertebrates as a result of the increased ship noise and impacts to water quality from resuspension of contaminated sediment. Increased vessel traffic could also increase the risk of spills, ballast discharge, and introduced invasive species, which could affect habitat.

The Navy would expand the Radio Hill complex and construct a new forge shop at NAVBASE Kitsap-Bangor. Materials storage and staging activities would occur in previously disturbed areas on-site within NAVBASE Kitsap-Bremerton, NAVBASE-Kitsap Bangor, offshore on barges or a temporary pier east of Pier 7, and at the contractor multi-use site(s) off-installation, potentially at the Port of Seattle and/or the Port of Tacoma. While the terrestrial storage and staging activities would occur in previously disturbed areas with minimal potential for impacts to Tribal resources, the offshore storage and staging activities could increase the risk of spills, ballast discharge, and introduced invasive species, which could affect habitat.

The Navy would construct two new buildings under Alternative 2. Some construction elements would occur in undeveloped forest land. Impacts to traditional resources could occur if these forested areas are among those that are accessed by Tribes for harvesting cedar bark and other plant materials. An increase in areas of impervious surface could impact surface water runoff and discharge, which could in turn impact habitat of treaty-protected resources in Sinclair Inlet and Hood Canal.

Implementation of BMPs that would protect fish, shellfish, and habitat, including procedures to limit windows for in-water work, to prevent introduction of aquatic invasive species from vessels, and others (MARINE BIO MGMT-1, -3, -4, -6, -7, -8, -10, -11, -12, -15, and -17), would reduce impacts to traditional resources at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, respectively. For further discussion of potential impacts on fish, shellfish, and habitat, see Section 3.5.

In addition, the Navy would implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under Section 404 of the Clean Water Act.

Contaminated Sediment

Currently, the presence of contaminated sediment affects the ability of the Suquamish Tribe to exercise their treaty rights because of health hazards associated with the consumption of fish and shellfish from Sinclair Inlet.

Under Alternative 2, in-water construction activities, including dredging, pile installation, and pile removal, would result in sediment suspension and the potential temporary release of sediment-bound contaminants into the water column. However, these impacts would primarily be limited to the project work footprint. Also, because dredging would permanently remove contaminated sediment, there would be long-term beneficial effects on sediment quality within the project area, which in turn would benefit traditional resources. Removal of treated timber piles is also one of the objectives of the Washington State Department of Natural Resources Creosote Removal Program which is working to reduce sources of contamination in Puget Sound by removing structures and debris that are treated with creosote.

Implementation of BMPs that would reduce suspension of contaminated sediment (WATER MGMT BREM-10, and WATER MGMT BREM-11) and compliance with permit requirements would reduce potential environmental impacts to traditional resources from contaminated sediment. For further discussion, see Sections 3.4.4 (Geological Resources) and 3.15.4 (Hazardous Materials and Wastes).

Water Quality

Suquamish Tribe fish rearing operations, including at Gorst Creek of Sinclair Inlet, are affected by impaired water quality, partly due to contaminants present in stormwater runoff (Suquamish Tribe 2021c; Mid Sound Fisheries Enhancement Group 2022). Water quality contributes to the health of fish and shellfish as well as to the health of their food sources and habitat. Waterfront improvements, including in-water activities (e.g., dredging, pile removal, and pile installation), and placement of riprap armor along dredged slopes, would result in temporary impacts during construction to Sinclair Inlet waters. Disturbance of the bottom sediment from certain in-water construction activities could resuspend sediment and generate associated turbidity in the water column.

The addition of M2D2 would increase the amount of process water at PSNS & IMF. Construction would include replacement of the storm drainage systems that would be demolished to build the new facilities. Alternative 2 would replace 20 existing outfalls as well as two new outfalls that would discharge waters into Sinclair Inlet. Construction impacts to Sinclair Inlet waters would be temporary and localized and would not violate any state or federal water quality standards. In addition, removal of contaminated sediment and treated wood pilings would improve localized water quality conditions in the project area. Upland construction activities at NAVBASE Kitsap-Bangor would also have the potential to impact water resources.

Implementation of BMPs (WATER MGMT BREM-1 through WATER MGMT BREM-15 and WATER MGMT BANGOR-1 through WATER MGMT BANGOR-4) and compliance with permit requirements would reduce impacts to traditional resources from changes in surface and marine water quality at both NAVBASE Kitsap-Bremerton and Kitsap-Bangor. For further discussion, see Section 3.3.3.

Interference with Tribal Fishing

The Navy considered the potential for the Proposed Action to interfere with Tribal fishing in terms of the increased noise, increased vessel traffic, and issues related to Tribal access of U&A fishing grounds and stations.

Under Alternative 2, construction is expected to last for more than 14 years, and noise and vessel traffic would increase. During this time, construction of new larger in-water facilities, construction noise and vessel traffic could interfere with Tribal fishing activities. Temporary mooring buoys could disrupt Tribal fishing activities. Upland construction would occur year-round, while in-water work would only occur during the in-water work window (as discussed in Chapter 2). Impacts from increased construction noise (i.e., vibratory/impact drivers) and vessel traffic would be part of the ongoing government-to-government consultation and would be clarified and updated in the Final EIS. The Suquamish Tribe has stated concerns about the impacts from construction and operation of the Proposed Action. Consultation between the Suquamish Tribe and the Navy is ongoing to confirm the level of impacts to traditional resources.

Construction vessel traffic associated with delivery and/or disposal of materials, equipment, and dredged material would extend beyond Sinclair Inlet into Puget Sound and could disrupt tribal fishing activities. Transport of two new caissons would include two separate one-way trips through the Strait of Juan de Fuca and the coastline of Washington State; impacts to Tribal fishers could occur during transport along those routes. Impacts to Tribal fishing would be resolved through government-to-government consultation with affected Tribes.

The Navy also considered the potential for the Proposed Action to interfere with Tribal gathering practices at NAVBASE Kitsap-Bangor associated with the expansion of the laydown area and construction of new buildings. Tribal access to U&A gathering areas could be impacted during construction.

Construction noise has the potential to impact fishing activities near construction areas. As discussed in Section 3.10, increased noise associated with construction would occur under all action alternatives. Loud and repetitive noise from impact pile driving could last for months at a time, in multiple stages of construction, and for different construction components at differing lengths of time. For instance, under both action alternatives, pile driving associated with Pier 4 demolition and construction would last for up to approximately 214 days.

Vessel Traffic

Under Alternative 2, vessel traffic would increase during construction and could interfere with fishing activities near NAVBASE Kitsap-Bremerton, especially during certain stages of construction when vessel traffic is at its peak. Project vessels would be required to avoid disturbance of Tribal and other fishing vessels, as outlined in Rule 18 (Responsibilities Between Vessels [33 CFR Section 83.18]): (a) A power-driven vessel underway shall keep out of the way of: (iii) a vessel engaged in fishing.

The Navy currently provides daily courtesy notifications (Monday – Friday, excluding federal holidays) of Navy vessel movements and is looking into the recent request made by Tribes to be notified of construction vessel traffic. Impacts from increased vessel traffic would be a topic of ongoing government-to-government consultation and would be clarified as needed in the Final EIS.

Existing security restrictions, including the PSB, prevent public access at Navy pier-side locations. Under both action alternatives, during construction the PSB may be relocated within the existing PSB area. After construction is complete, the Navy would modify some PSB buoys and anchors in the vicinity of the new M2D2. The PSB would not extend farther south than the current PSB alignment and the area within the PSB would not increase. Therefore, there would be no impacts from the PSB to Tribal access of U&A fishing grounds and stations.

Operation-related Impacts

Under Alternative 2, operations at PSNS & IMF would not increase and would be expected to be similar to baseline conditions related to ship presence, noise levels, amount of vessel traffic, and access to U&A fishing grounds and stations. However, development of proposed facilities would result in a net increase of impervious surface at both NAVBASE Kitsap-Bremerton (up to 8 acres) and NAVBASE Kitsap-Bangor (20 acres). In addition, at NAVBASE Kitsap-Bremerton, the addition of M2D2 would increase the amount of process water by approximately 16 percent (Section 3.3.3.4). With stormwater system improvements and management/treatment/discharge of groundwater, stormwater, and process water in compliance with PSNS & IMF NPDES industrial discharge permit or stormwater discharge permit, as applicable at both NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, long-term adverse impacts to water resources during operation of Alternative 2 are not expected. The expanded Radio Hill complex and new facilities at NAVBASE Kitsap-Bangor would not limit or change the ability of Tribes to access the installation, however, the new permanent laydown areas would reduce the amount of forest land available for Tribal harvest.

Changes in the Availability and Harvestability of Fish and Shellfish

Fish, Shellfish, and Habitat

Operation-related disturbance to fish, shellfish, and habitat are expected to be similar to baseline conditions. Effects on marine vegetation from ship presence and increased shading are expected to be minimal because macroalgae are not generally present in areas adjacent to piers where ships dock at NAVBASE Kitsap-Bremerton.

Contaminated Sediment

Operation-related disturbance of contaminated sediment is expected to be similar to baseline conditions.

Water Quality

Following construction, dry dock stormwater and process water would be collected for treatment and discharge to either the sanitary sewer or Sinclair Inlet in accordance with permitted limits. Upland stormwater, and stormwater on the piers/wharves would be collected and treated before being discharged into Sinclair Inlet. Management and treatment of stormwater and process water would improve water quality and decrease potential operational impacts on the habitat of traditional resources. During operations, water quality could be affected by small inadvertent releases of oil and other hazardous substances as a result of, for instance, a misaligned valve on a vessel directing material overboard. With management, treatment, and discharge of groundwater, stormwater, and process water as well as discharges from cooling and firefighting in compliance with all applicable permits at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, long-term adverse impacts to water quality are not anticipated under either action alternative. See Section 3.3, Water Resources, for complete details.

Interference with Tribal Fishing

Alternative 2 is not anticipated to create new interference with Tribal fishing during operations.

The expanded Radio Hill complex and new facilities at NAVBASE Kitsap-Bangor would not limit or change the ability of Tribes to access the installation. However, the new permanent laydown areas would reduce the amount of forest land available for Tribal harvest.

Noise

Operational noise levels at PSNS & IMF are expected to be similar to baseline conditions.

Vessel Traffic

Naval marine traffic volumes are expected to return to their existing pre-construction levels once construction is complete.

Access to U&A Fishing Grounds and Stations

After construction, the Navy would modify some PSB buoys and anchors in the vicinity of the M2D2. The PSB would not extend farther south than the current PSB alignment and the area within the PSB would not increase. The PSB alignment part of the Proposed Action would not change access to U&A fishing grounds and stations. Installation and operation of a permanent outfall and diffuser could permanently interfere with Tribal fishing in the location of the structures.

Effects Associated with Reasonably Foreseeable Future Actions

Other RFFA planned projects at NAVBASE Kitsap-Bremerton with in-water components (Table 3.7-2) could increase in-water disturbance by increasing sedimentation, contamination, construction noise, and construction vessel traffic. Implementation of water quality and surface sediment quality BMPs would minimize impacts of sedimentation and contamination associated with in-water construction projects. RFFAs could also cause disturbances to traditional resources, and the level of increase in noise and in vessel traffic could be disruptive to Tribal fishers and gatherers, as well as to traditional resources, particularly when activities occur over a number of years.

Some RFFAs could be beneficial and align with the Suquamish Tribe's water quality restoration goals. For example, with implementation of Marine Structure Maintenance and Pile Replacement Activities and PSNS & IMF and OU B Marine Remedial Actions, overall improvement to marine water quality is expected, with positive long-term impacts from removal of creosote pilings and contaminated sediment in Sinclair Inlet.

The Suquamish Tribe has stated concerns about the impacts from construction and operation of the Proposed Action. Consultation between the Suquamish Tribe and the Navy is ongoing to confirm the level of impacts to traditional resources for Alternative 2.

3.7.3.5 Impact Analysis for Alternative 3

Construction and operation-related impacts under Alternative 3 would be similar to Alternative 2, but with some differences in terms of degree and locations of the impacts. Under Alternative 3, a new M2D2 would be constructed at the location of existing Mooring A. A new Wharf 2 would be constructed on the outer east wall of M2D2. Dimensions of the M2D2 would be the same as Alternative 2. New facilities would be constructed to replace demolished facilities and to support the new M2D2. Mooring A, Pier 4, and the Hammerhead Crane on Pier 6 would be demolished, and Pier 4 would be replaced with a new pier. Dockside, Wycoff Way would be reconfigured. Dredging of bottom sediment would create a new turning basin, and adequate draft at wharves and piers. This alternative also includes modifications to Moorings E, F, and G and relocation of existing stored inactivated ships from Mooring A.

Table 3.7-4 summarizes the similarities and differences between Alternatives 2 and 3.

Table 3.7-4 Summary of American Indian Traditional Resources Issues by Alternative

Issue	*Impact*	*Alternative 2 (Preferred Alternative) M2D2 at DD3*	*Alternative 3 M2D2 at Mooring A*
Dredging would remove aquatic vegetation and impact traditional resources	Dredging quantity (CY)	867,450	1,651,000
	Total dredging area (acres)	36.92	69
	Permanent fill discharged below MHHW (CY)	534,600	1,180,685
	Temporary fill area (acres)	2.02	0
	Permanent fill area (acres)	11.25	19.59
	Subset of dredging area with aquatic vegetation (acres)	0.10	1.50
New overwater coverage would potentially reduce habitat of traditional resources	Net increase in overwater coverage (acres)	1.37	5.47

Issue	*Impact*	*Alternative 2 (Preferred Alternative) M2D2 at DD3*	*Alternative 3 M2D2 at Mooring A*
In-water construction (e.g., pile installation and removal) could impact fish, shellfish, and habitat (noise, vibration, turbidity, mortality) and reduce contamination (e.g., removal of treated piles)	Total number of piles removed	4,891	796
	Number of new piles	5,410	3,303
	New temporary sheet piles (linear feet)	350	900
	New temporary steel pipe piles	800	740
Dredging would remove contaminated sediment and improve water quality and surface sediment quality	Increase in area complying with SMS (acres)	37.92	49.22
Temporary mooring buoys could impact Tribal fishing	Temporary mooring buoys	18	18
New outfalls discharging into Sinclair Inlet could affect water quality for traditional resources	New storm drain features	20 existing 8-inch outfalls would be replaced; 1 12-inch and 1 24-inch outfall would be constructed	Same as Alternative 2
Intermittent construction activities and noise could interfere with Tribal fishing over a long period of time	Overall schedule (years)	2027–2041	2027–2041
	Total duration (days)	5,639	4,253
Vessel traffic could interfere with Tribal fishing	Number of vessels (construction)	Between 6 and 22 vessels per day	Between 6 and 28 vessels per day
	Number of vessels (operations)	Same as baseline	Same as baseline
Construction and operations could impede access to U&A areas	Change in area inside port security barrier (acres)	Same as baseline	Same as baseline
	New restricted areas	No new restricted areas	No new restricted areas
Construction of new forge shop could reduce access to U&A resource-gathering areas at NAVBASE Kitsap-Bangor	Construction footprint	TBD	N/A
Operation of new forge shop could interfere with Tribal harvesting practices	New access restrictions	TBD	N/A

Issue	*Impact*	*Alternative 2 (Preferred Alternative) M2D2 at DD3*	*Alternative 3 M2D2 at Mooring A*
Expansion of Radio Hill complex and construction of new facilities at NAVBASE Kitsap-Bangor would reduce U&A resource gathering areas	Construction footprint	10 acres	Same as Alternative 2
Expansion of laydown area and operation of new facilities at NAVBASE Kitsap-Bangor would reduce U&A resource gathering areas	New access restrictions	TBD	N/A

Notes: Numbers used in this table are based on preliminary design and are subject to modification.
Legend: CY = cubic yard; DD = dry dock; MHHW = mean higher high water; N/A = not applicable; NAVBASE = Naval Base; SMS = sediment management standards; TBD = to be provided; U&A = usual and accustomed

Construction-related Impacts

Under Alternative 3, construction-related impacts would include impacts on the availability and harvestability of traditional resources and interference with Tribal fishing, such as described for Alternative 2 (Section 3.7.3.4).

Under Alternative 3, traditional resources also could be impacted by a loss of benthic invertebrates due to dredging and fill construction activities conducted over an approximate combined area of 89 acres, which is approximately 37 acres more than Alternative 2. Dredging would impact the approximate same number of acres of aquatic vegetation as Alternative 2. Construction would result in a net increase of overwater coverage over an area that is slightly more than Alternative 2 by 0.3 acre, and an increase in impervious surface area that is 3 acres more than Alternative 2. Under Alternative 3, the removal of contaminated sediment from an area of approximately 49 acres, which is 11 acres more than Alternative 2, could have a beneficial impact by improving water quality and surface sediment quality across a larger area, but fewer pilings (including creosote-treated pilings) would be removed than under Alternative 2.

Under Alternative 3, intermittent noise from construction activities would occur less than under Alternative 2. Potentially disruptive noise associated with in-water work under Alternative 3 would also be less than Alternative 2 based on thousands of fewer timber piles and sheet piles that would be removed and replaced under Alternative 2. Vessel traffic would increase by an additional 6 to 28 vessels per day during construction of Alternative 3, which is up to six vessels more per day during certain periods of construction than is expected under Alternative 2.

Operation-related Impacts

Under Alternative 3, operation-related impacts would be the same as described in Alternative 2 (Section 3.7.3.4). However, development of proposed facilities would result in a net increase of 8 acres of impervious surface and an increase in process water amount by 33 percent (Section 3.3.3.5). With stormwater system improvements and management/treatment/discharge of groundwater, stormwater, and process water in compliance with the applicable PSNS & IMF National Pollutant Discharge Elimination System industrial discharge permit or stormwater discharge permits, as applicable at both NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, long-term adverse impacts to water resources during operation of Alternative 3 are not expected.

Effects Associated with Reasonably Foreseeable Future Actions

Effects to traditional resources associated with RFFAs would be similar as those described in Alternative 2 (Section 3.7.3.4).

Summary

Table 3.7-4 provides a comparison of the impacts from Alternatives 2 and 3 and Table 3.7-5 is a summary of impacts to American Indian traditional resources for Alternatives 2 and 3.

Table 3.7-5 Summary of Potential Impacts on American Indian Traditional Resources

Concern	*Potential Impacts*
Change in the Availability and Harvestability of Traditional Resources	Construction could impact the availability of traditional resources through habitat impacts, including vegetation removal and permanent overwater coverage. Availability and harvestability of traditional resources could be impacted due to injury and altered behavior from noise and water turbidity during construction. Removal of contaminated sediment and creosote-treated pilings would lead to improved water quality and surface sediment quality in localized areas, which would benefit traditional resources. Operation-related impacts are expected to be similar to existing baseline conditions, although the amount of process water used and surface area runoff would increase. The amount of water discharge into Sinclair Inlet from NAVBASE Kitsap-Bremerton would increase but would adhere to water quality standards. At NAVBASE Kitsap-Bangor, construction could impact traditional resources through vegetation removal and potential loss of gathering areas. Loss of vegetation and increased impervious surface area could also increase stormwater runoff but adverse impacts to water quality are not anticipated.
Interference with Tribal Fishing	Noise and vessel traffic would increase during construction over baseline conditions and have the potential to interfere with Tribal fishing activities. Construction is expected to last for more than 14 years. Temporary mooring buoys could disrupt Tribal fishing activities. New permanent laydown areas would reduce the amount of forest land available for Tribal harvest at NAVBASE Kitsap-Bangor. Operation-related impacts are expected to be similar to existing baseline conditions with regard to noise and vessel traffic.

Legend: NAVBASE = Naval Base; U&A = usual and accustomed

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3.8 Land Use and Recreation

This discussion of land use includes current and planned uses and the regulations that may control the use proposed for the study area. The term “land use” refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. However, there is no nationally recognized convention or uniform terminology for describing land use categories. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational. This discussion also includes impacts

to recreational opportunities within the study area and surrounding areas. Recreational opportunities typically include fishing, swimming, hiking, hunting, off-road vehicles, camping, and picnicking.

3.8.1 Regulatory Setting

Table 3.8-1 provides a list of the existing regulatory environment for land use and recreation at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, Washington. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.8-1 Regulatory Setting for Land Use and Recreation

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
DoD Anti-terrorism Program	DoD Instruction O-2000.16. DoD Antiterrorism Program Implementation: DoD Antiterrorism Standards
Endangered Species Act	16 U.S.C. section 1531 *et seq*.
Migratory Bird Treaty Act	16 U.S.C. section 703-712
Coastal Zone Management Act of 1972	16 U.S.C. Section 1451, 15 CFR Part 930
Magnuson-Stevens Fishery Conservation and Management Act and Sustainable Fisheries Act	16 U.S.C. section 1801 *et seq*.
Naval Encroachment Management Program	OPNAVINST 11010.40
Area Development Plans	NAVBASE Kitsap-Bremerton Area Development Plan (2018)
Land Use Plans	NAVBASE Kitsap Joint Land Use Study (2015)
Integrated Natural Resources Management Plan	NAVBASE Kitsap Integrated Natural Resources Management Plan (2018)
Installation Development Plans	NAVBASE Kitsap-Bremerton Installation Development Plan (2016)
State	
Washington State Shoreline Management Act of 1971	Chapter 90.58 RCW
Washington State Recreation and Conservation Plan	Washington State Government, March 2023
Washington State Recreational Boating Plan	Washington State Boating Laws
Washington State, State Trails Plan	Washington Water Trails Association (2021)
Local	
Kitsap County Shoreline Master Program	Kitsap County Shoreline Master Program
Kitsap County Comprehensive Plan	Kitsap County Comprehensive Plan
City of Bremerton Comprehensive Plan and Zoning Ordinance	City of Bremerton Comprehensive Plan and Zoning Ordinance
City of Bremerton Shoreline Master Plan	City of Bremerton Shoreline Master Plan
Port Orchard Shoreline Master Plan	Port Orchard Shoreline Master Plan
City of Bremerton Parks, Recreation and Open Space Plan	City of Bremerton Parks, Recreation and Open Space Plan
Kitsap County Parks, Recreation and Open Space Plan	Kitsap County Parks, Recreation and Open Space Plan

Legend: CFR = Code of Federal Regulations; DoD = Department of Defense; NAVBASE = Naval Base; OPNAVINST = Office of the Chief of Naval Operations Instruction; RCW = Revised Code of Washington; U.S.C = U.S. Code

3.8.2 Affected Environment

The following discussion provides a description of the existing conditions for land use and recreational resources at and surrounding NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor. The ROI for the land use and recreation analysis includes those areas where the land use or recreation use would potentially be impacted by the Proposed Action. This includes NAVBASE Kitsap-Bremerton, primarily the CIA, the portion of the City of Bremerton that surrounds the installation, and Sinclair Inlet. Properties adjacent to the installation are zoned as residential, commercial, industrial, Charleston Commercial District-District Core Center, and Downtown Sub area (Figure 3.8-1). The ROI also includes NAVBASE Kitsap-Bangor, specifically the community support district and installation support districts, the community of Silverdale surrounding the southern part of the installation, and Hood Canal (Figure 3.8-2).

3.8.2.1 Existing Conditions

NAVBASE Kitsap-Bremerton

NAVBASE Kitsap-Bremerton is composed of three distinct districts: the operations district, industrial support district, and the community support district. The operations district spans the entire waterfront portion of the installation. Primary land uses are maintenance, production, and operations, along with some utility, supply and storage uses. The industrial support district lies in the central portion of the installation and supports maintenance and production.

The community support district is located on the northern portion of the installation and includes a mix of administration, residential, community, and recreational/open space land uses. The project area within NAVBASE Kitsap-Bremerton is located within the highly developed CIA, dominated by operation and maintenance facilities. The study area is constrained by explosives safety quantity distance (ESQD) arcs, but the arcs do not extend outside the NAVBASE Kitsap-Bremerton property. Further discussion of ESQD arcs can be found in Section 3.14 Public Health and Safety. The upland project area is completely within Navy-owned land in previously disturbed areas with no significant land use restrictions due to Endangered Species Act- and Migratory Bird Treaty Act-protected species (Navy 2018c). Further discussion of species and habitat located within the study area is found in Section 3.5 Biological Resources.

Because the Proposed Action and alternatives include structures that would be occupied by Navy personnel, the applicability of Anti-Terrorism Force Protection (ATFP) requirements is evaluated in this EIS. ATFP standards consist of restrictions on site planning, including safety standoff distances, building separation, unobstructed space, drive-up and drop-off areas, access roads, and parking; structural design; structural isolation; and electrical and mechanical design. Further discussion of ATFP considerations within the project area is found in Section 3.14 Public Health and Safety.

In accordance with the NAVBASE Kitsap Integrated Natural Resources Management Program (INRMP), the Navy manages natural resources and provides natural resources related outdoor recreation opportunities while supporting existing and future military mission needs (Navy 2018c). The INRMP discusses three special management areas at NAVBASE Kitsap-Bremerton: (1) dry docks, where the Navy implements measures to minimize effects to fish species; (2) historic housing districts, where ornamental landscaping is maintained; and (3) Charleston Beach, where the Navy maintains a habitat restoration area. NAVBASE Kitsap-Bremerton has minimal active natural resource recreation opportunities.

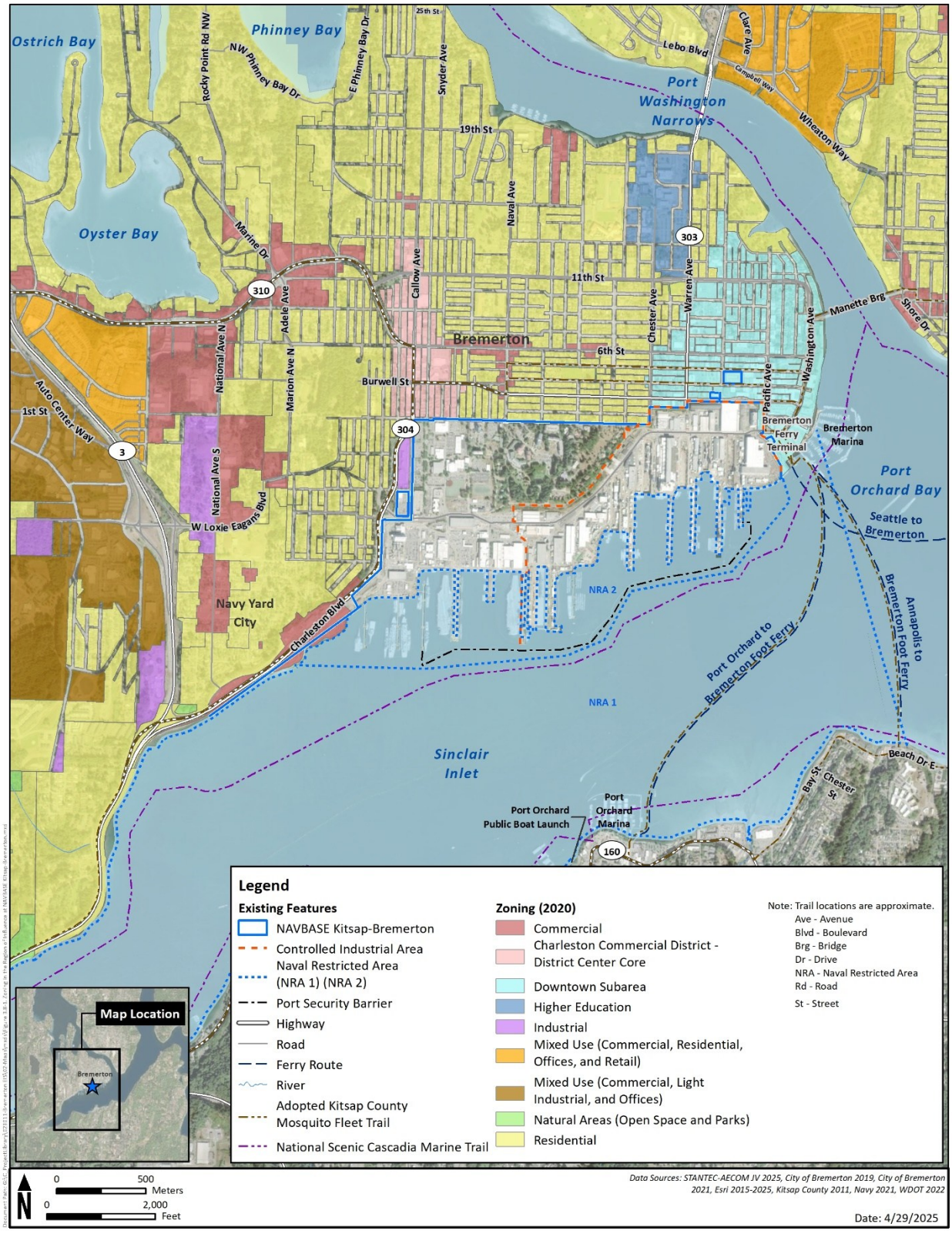

Figure 3.8-1 Zoning in the Region of Influence at NAVBASE Kitsap-Bremerton

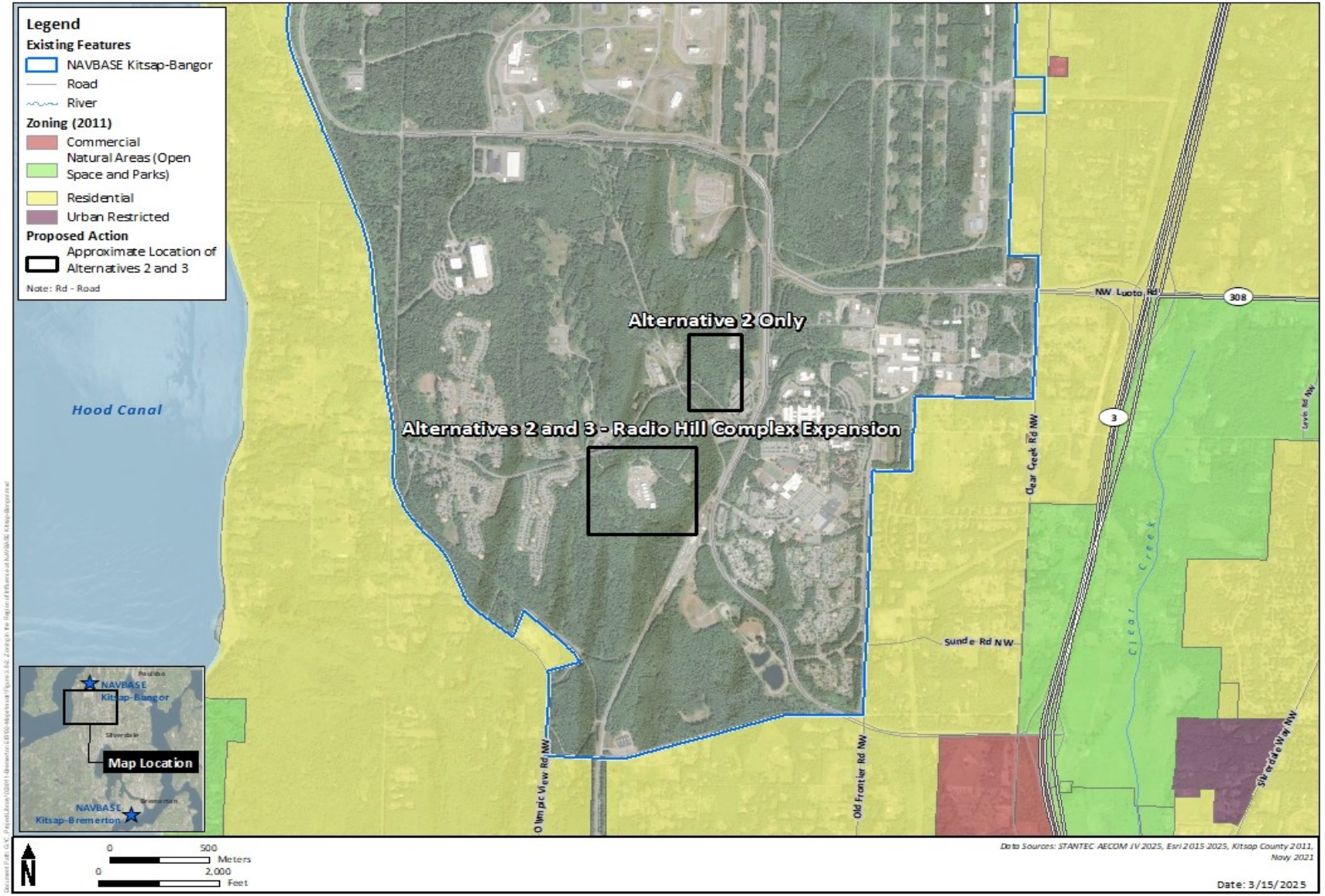

Figure 3.8-2 Zoning in the Region of Influence at NAVBASE Kitsap-Bangor

Sinclair Inlet

NAVBASE Kitsap-Bremerton is not part of the Washington State coastal zone as defined under the Coastal Zone Management Act (CZMA). When the Navy's Proposed Action may have affects to any land or water use or natural resource of the coastal zone, the action shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of the Washington State Coastal Zone Management Program. The City of Bremerton Shoreline Master Program has designations of the coastline on either side of the installation boundaries. Shoreline that extends past Harborside Fountain Park and the Bremerton Marina is designated as downtown waterfront (City of Bremerton 2021). Downtown Waterfront designation is a commercial designation for the downtown shoreline area that is subject to the Downtown Subarea Plan (City of Bremerton 2021).

In 2014, the U.S. Department of Interior officially designated the Kitsap Peninsula National Water Trail as part of the National Water Trails System, the first in Washington State and the only saltwater trail in the U.S. It identifies recreational access points surrounding Sinclair Inlet and includes the Bremerton Marina, Water Street Boat Launch, Port of Bremerton Marina Park at Port Orchard, and Port Orchard Marina (Kitsap Peninsula National Water Trails 2021).

The National Scenic Cascadia Marine Trail follows the shoreline of Sinclair Inlet. This water trail on Puget Sound is a National Recreation Trail and designated one of only 16 National Millennium Trails by the White House (Washington Water Trails Association 2021). It provides a route for kayakers and paddlers around the shoreline of Sinclair Inlet (see Figure 3.8-1).

Kitsap County Mosquito Fleet Trail is an adopted Kitsap County public trail designed to connect the historic Mosquito Fleet ferry docks and landing sites while promoting waterfront access, scenic views, and historic landmarks. The trail has a portion located in downtown Bremerton and connects the Bremerton Foot Ferry dock to the Port Orchard-Bremerton Foot Ferry and the Bremerton-Annapolis Foot Ferry (see Figure 3.8-1) (NAVBASE Kitsap 2015; City of Bremerton 2016).

Other recreation opportunities include kayaking, paddling, diving, and boating in Sinclair Inlet, with launch and mooring sites at the Bremerton Marina and the Port Orchard Marina. Additionally, recreational fishing occurs in Sinclair Inlet. Discussion of tribal fishing rights can be found in Section 3.7 American Indian Traditional Resources.

Recreational activities are also supported by the Washington State Department of Transportation and Kitsap Transit ferries that provide transportation to and from Seattle, Port Orchard, and Annapolis. Further discussion of the ferry system can be found in Section 3.13 Marine Navigation.

City of Bremerton

NAVBASE Kitsap-Bremerton is located within the City of Bremerton. The City's Comprehensive Plan designates properties surrounding the installation as low density residential or urban uses (NAVBASE Kitsap 2015; City of Bremerton 2016). Other than a very small parcel of Limited Commercial zoned land in the half-block south of Burwell Street between Chester and Warren Avenues (which contains the Bremerton Police Station) and the two urban core areas shown on Figure 3.8-1, a large portion of the northern perimeter abuts a long-established area of single-family homes (NAVBASE Kitsap 2015). Both the City of Bremerton Comprehensive Plan designation and City of Bremerton Zoning Code support the preservation of this area as a single-family home neighborhood and thus significant changes are not likely (City of Bremerton 2016, 2020).

The proximity of this residential area to the installation and the broad range of uses occurring within the installation, however, make this neighborhood sensitive to changes and activities that occur on the installation. Several blocks of the neighborhood lie immediately across an alley (Mahan Avenue) from the installation fence line (NAVBASE Kitsap 2015). The Charleston commercial district (zoned District Center Core) lies to the northwest of the installation perimeter, and Industrial Park zoning lies to the west, opposite Callow Avenue south (near the Farragut Street entrance). A low-density single-family home zone is to the west of Charleston Boulevard (State Route [SR] 304) (NAVBASE Kitsap 2015; City of Bremerton 2020). East of the installation is the Downtown Subarea, zoned with a mix of residential, commercial, and/or mixed use (City of Bremerton 2016). Land use surrounding NAVBASE Kitsap-Bremerton is depicted in Figure 3.8-1.

NAVBASE Kitsap-Bangor

NAVBASE Kitsap-Bangor is composed of five distinct districts: the community support district, installation support district, production district, operations district, and open space district. Primary land uses that make up the community support district, located along the southernmost portion of the installation, include open space and recreation, residential, community and training operations. Primary land uses of the installation support district include administration and training operations. Primary land uses of the production district (the largest of the districts), located on the eastern edge of the installation, include operations, maintenance/production, and ordnance operations. Primary land uses of the operations district include operations and maintenance/production. The open space district is entirely made up of recreational and open space land uses. Much of the surrounding land uses abutting the installation boundary are zoned as residential.

The project area within NAVBASE Kitsap-Bangor is located within the community support and installation support districts located in an area where land use is designated solely as training operations. Recreational activities are not analyzed for NAVBASE Kitsap-Bangor because the areas proposed for development are not used for, or designated as, recreational areas.

3.8.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Tables 3.8-2 and 3.8-3 summarize the potential effects to land use and recreation from RFFAs with a close causal relationship to the project.

Table 3.8-2 Effects to Land Use and Recreation from Reasonably Foreseeable Future Actions – NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy –Pier 3 Electrical Substation Repair, PSNS & IMF	Within the ROI	The modernization project is located within the CIA area and would not impact land use or recreation.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF, and NAVBASE Kitsap-Manchester	Within the ROI	Maintenance and pile replacement activities could create temporary noise impacts on land use and recreation during construction. The project would occur within the port security barrier, and no impacts to land use or recreation would be expected.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Manchester Tank Farm improvements, NAVBASE Kitsap-Manchester	Outside the ROI at NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	This project is not located within the project area, and there is no reasonably close causal relationship to land use.
Navy – Shipyard Infrastructure Optimization Program, PSNS & IMF	Within the ROI	Some SIOP projects could overlap with the Proposed Action. Capital improvements in and over water could increase noise and vessel traffic; impacts would be minimized through BMPs.
Navy – Operable Unit B Marine Source Removal Actions	Within the ROI	The remediation project is located within the installation boundary and PSB and would not impact land use or recreation.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	Outside the ROI. NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	This project is not located within the project area, and there is no reasonably close causal relationship to land use.
Navy – NAVBASE Kitsap Bremerton Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	Within the ROI	A CERCLA investigation is ongoing in the Proposed ROI but would not impact land use or recreation.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	Within the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation identified.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Within the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use.
Port of Bremerton - Marina Breakwater Replacement, Port Orchard Marina (NWS-2022-0513)	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Private Development – The Beacon and Beacon II	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Private Development – McWilliams Apartment	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.

Legend: BMPs = best management practices; CIA = Controlled Industrial Area; NAVBASE = Naval Base; Navy = United States Department of the Navy; PSB = Port Security Barrier; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; ROI = Region of Influence; SIOP = Shipyard Infrastructure Optimization Program

Sources: Navy 2018a, 2018b, 2019a, 2019b, 2021a, 2021b

Table 3.8-3 Effects to Land Use and Recreation from Reasonably Foreseeable Future Actions – NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy - Transit Protection Program Support Facilities	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Navy - Child Development Center	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Navy - Military Working Dog Kennel Replacement	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Navy - Repair Substation 5	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Navy - Tang Road Repair	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Navy - Equipment Processing Building	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Navy - Relocate Flier Road	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Navy – CERCLA actions for PFAS	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Navy – CERCLA Operable Unit 1 Site A	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.
Navy – CERCLA Operable Unit 2 Site F	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Alternate Power Transmission Line	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to land use or recreation.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = United States Department of the Navy; PFAS = per and polyfluoroalkyl substances; ROI = Region of Influence; UXO = unexploded ordnance

Sources: Navy 2019c, Navy 2022b, Navy 2020, Navy 2022c, Navy 2022d, Navy 2020b, Navy 2019d.

3.8.3 Environmental Consequences

The location and extent of a Proposed Action needs to be evaluated for its potential effects on a project site and adjacent land uses. Factors affecting a Proposed Action in terms of land use include its compatibility with on-site and adjacent land uses, consistency with Navy plans, and consistency with federal, state, and local regulations and plans. Other considerations are given to proximity to a Proposed Action, the duration of a proposed activity, and its permanence. The effects analysis evaluated the potential for beneficial or adverse impacts in consideration of BMPs listed in Appendix A. The BMPs are measures that the Navy would implement to reduce the environmental impacts of designated activities, functions, or processes.

There are no BMPs identified for land use or recreation.

3.8.3.1 Nature and Type of Effects

The nature and types of effects to land use and recreation could include changes in land use that would be incompatible with on-site and/or adjacent land uses, changes to the Washington State coastal zone, changes to existing recreational activities, or inconsistencies with Navy and local plans. For demolition/construction of in-water structures, modification of upland facilities and dredging impacts could include activities such as temporarily moving the PSB, dredging of Sinclair Inlet, and noise impacts to surrounding land uses and recreationists.

3.8.3.2 Impact Assessment Methodology

The impact assessment methodology involved general literature searches and review of publicly available land use information from the Navy, State of Washington, and the City of Bremerton.

The intent of this research was to establish baseline conditions for land use and recreation within and directly adjacent to the land use and recreation ROI. Data analysis performed in relation to the proposed project construction and operational activities used predominantly qualitative methods, including professional judgment. The intent of the analysis was to document potential changes that may occur to land use and recreation as a result of project construction and operational activities.

The following sections summarize the primary types of impacts and their anticipated duration associated with land use and recreation that could result from implementation of the Proposed Action for the alternatives being evaluated in this EIS.

3.8.3.3 Impact Analysis for Alternative 1: No-Action

Under Alternative 1, the Proposed Action would not proceed. Therefore, there would be no impacts to land use and recreation.

3.8.3.4 Impact Analysis for Alternative 2 (Preferred Alternative)

Construction-related Impacts

NAVBASE Kitsap-Bremerton

Proposed demolition and construction of existing and new in-water structures and modification of required upland facilities for Alternative 2, as identified in Section 2.3, would all occur within existing industrial waterfront areas that have been previously disturbed as well as being within the installation boundary. Though new piers and larger dry docks would be constructed as part of this alternative in areas where infrastructure does not currently exist, the land use in this area would remain unchanged. Therefore, no short-term, long-term, or permanent impacts or changes to land use would occur. Current land use at the NAVBASE Kitsap-Bremerton and the implementation of Alternative 2 at NAVBASE Kitsap-Bremerton is compatible with land use identified in installation planning documents as described in Section 3.8.1.

Sinclair Inlet

Dredging activities could temporarily limit access or impact water-oriented recreation activities due to barges or dredging equipment within Sinclair Inlet. Impacts to water-oriented recreation activities would be phased over time and follow the phasing of construction activities for each of the alternatives. As described in Section 3.13.3 Marine Navigation, construction-related marine traffic may impact recreational and fishing vessels by reducing the available space for them to transit the inlet and synchronizing the timing of transits may not be feasible (e.g., a recreational vessel may need to alter course or wait for construction-related marine traffic to pass or clear the waterway before proceeding). See Section 3.13.3 Marine Navigation for a more detailed analysis of impacts to marine traffic from construction and dredging activities within Sinclair Inlet.

The PSB, located within the Naval Restricted Area (NRA), would be moved for each construction activity to exclude the project site from the CIA. This exclusion and barrier relocation would allow the labor force to access the project site. The PSB would not extend farther south than the current PSB alignment, and the area within the PSB would not increase or restrict the existing water recreation areas available in Sinclair Inlet. Additionally, no proposed demolition or construction activities would occur outside the NRA and would not affect recreationists following the National Scenic Cascadia Marine Trail or other water trails detailed in Section 3.8.2.1.

All construction and demolition activities would be within the installation boundary and the NRA and would not impact the area available to recreationists in Sinclair Inlet. However, construction activities, such as piling driving and barges entering and exiting the project area, could impact recreationists within Sinclair Inlet. Recreational fisherman would be impacted as the noise and increased marine traffic would likely temporarily limit the space for fishing in the inlet and could scare fish away from the pile driving noise. The extent and intensity of noise impacts on the areas surrounding the proposed demolition and construction of existing and new in-water structures and modification of required upland facilities is described in Section 3.10 Noise. The extent and intensity of additional marine traffic within Sinclair Inlet is described in Section 3.13.3 Marine Navigation.

NAVBASE Kitsap-Bremerton is not part of the Washington coastal zone as defined under the CZMA; however, the Proposed Action may have effects on coastal resources outside of the base boundaries. The Navy will prepare a Coastal Consistency Determination to address the Proposed Action's consistency with the enforceable policies of Washington State's Coastal Zone Management Program.

City of Bremerton

Proposed demolition and construction of existing and new in-water structures and modification of required upland facilities, as identified in Section 2.3, would all occur within the installation boundaries and not change any land uses surrounding the installation. However, the noise generated from construction and modification activities would have temporary impacts to the land uses bordering the installation, as impacts would be spread out over time during the construction phases. The northern perimeter of the installation abuts a long-established area of single-family homes that would be impacted by the additional construction noise. A more detailed analysis of the extent of the noise impacts to the surrounding communities is described in Section 3.10 Noise.

NAVBASE Kitsap-Bangor

Under Alternative 2, the proposed Radio Hill complex expansion located at NAVBASE Kitsap-Bangor, as described in Section 2.3, would occur within the installation boundary, and would not change the current land use designation. The Navy would permanently expand the Radio Hill complex at NAVBASE Kitsap-Bangor to replace some PSNS & IMF space and functions lost due to construction of M2D2. Although expansion of the Radio Hill complex would change the landcover from forested to developed, the land use would be compatible with the existing NAVBASE Kitsap-Bangor community support district. Expansion of the Radio Hill complex would not impact training operations that occur within this base district. There would not be any impact to recreational activities.

Additionally, under Alternative 2, a new forge shop would be constructed at NAVBASE Kitsap-Bangor. Although the proposed forge shop at NAVBASE Kitsap-Bangor would change the landcover from forested to developed, the land use would be compatible with the existing NAVBASE Kitsap-Bangor base support district. This change would not impact training operations that occur within this base district and would not induce further land use changes that would significantly change the land use within this district. Additionally, there are no recreation activities available in this area; thus, no impacts to recreation would be expected.

Operation-related Impacts

NAVBASE Kitsap-Bremerton

Under Alternative 2, no impacts to land use are expected because all new permanent structures would occur within the CIA and NRA and be consistent with current installation land uses. There are no recreational activities allowed within the PSB and NRA, thus no operational related impacts to recreation would occur.

Sinclair Inlet

Operations following implementation of Alternative 2 would remain within the boundary of the installation causing no land use impacts. Post-construction, the PSB would be returned to its current location and all construction-related water traffic would be complete; thus, there would be no permanent impacts to recreation within Sinclair Inlet.

City of Bremerton

Under Alternative 2, operations of the new facilities would be similar to existing operations, including the level of noise produced on installation. No new operational impacts to surrounding land uses or recreation are anticipated.

NAVBASE Kitsap-Bangor

Under Alternative 2, the expansion of the Radio Hill complex and construction of the forge shop at NAVBASE Kitsap-Bangor would not change existing land use district designation. Therefore, no operational impacts from the would be expected.

Effects Associated with Reasonably Foreseeable Future Actions

Alternative 2 would incorporate adaptation into new construction and upgrades from any potential future sea level rise. There are no other anticipated effects to land use and recreation from Reasonably Foreseeable Future Actions that would result in additive effects to the overall future condition of land use or recreation within the ROI.

3.8.3.5 Impact Analysis for Alternative 3

Construction-related Impacts

Construction-related impacts under Alternative 3 would be consistent with those described for Alternative 2 (see Section 3.8.3.4), with minor construction differences as described in Section 2.3, with the exception of the forge shop construction at NAVBASE Kitsap-Bangor and the intensity of dredging required to construct a new turning basin within Sinclair Inlet. The duration of construction for this project would be consistent with Alternative 2.

All construction and demolition activities would be within the installation boundary and the NRA and would not impact the area available to recreationists in Sinclair Inlet, with the exception of proposed dredging activities and turning basin. However, impacts to recreationists in the Sinclair Inlet are expected to be temporary, lasting until the turning basin is complete, approximately 200 days. See 3.13.4 for a more detailed analysis of impacts to marine traffic from dredging activities for Alternative 3.

Operation-related Impacts

Operation-related impacts under Alternative 3 would be consistent with those described for Alternative 2 in Section 3.8.3.4.

Effects Associated with Reasonably Foreseeable Future Actions

Effects to land use and recreation from Reasonably Foreseeable Future Actions would be the same as described in Section 3.8.3.4.

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3.9 Aesthetics/Visual Resources

This discussion of aesthetics and visual resources includes the natural and built features of the landscape from publicly accessible views that contribute to an area's visual quality. Visual perception is an important component of environmental quality that can be impacted through changes created by various projects. The aesthetic quality of an area is subjective because it is a measure of one's perception of how pleasing an area seems. Visual impacts occur as a result of the relationship between people and the physical environment.

The historic significance of structures, specifically those within a historic district, National Historic Landmark, or a property eligible for the National Register of Historic Places have an important role in the visual setting of an area. Section 3.6, Cultural Resources provides description and analysis of historic and culturally significant visual elements within the project area, including a historical viewshed analysis. The analysis presented in this section, Section 3.9, does not consider the cultural or historic designation

of visual elements, rather any use of the term historic is related simply to the longevity of the structure within the visual environment and the public's expectation of the element as a long-standing part of the overall aesthetic.

3.9.1 Regulatory Setting

Aesthetics and elements related to the visual environment of proposed projects within NAVBASE Kitsap-Bremerton, Washington, are mainly guided by the NAVBASE Kitsap-Bremerton Area Development Plan and Installation Development Plan and the NAVBASE Kitsap Installation Appearance Plan. The Area Development Plan identifies capacity for future development at various areas of NAVBASE Kitsap-Bremerton. The Installation Development Plan provides a comprehensive vision of the entire installation. The Installation Appearance Plan provides standards and guidelines for the appearance and design of buildings, site features, and landscaping for the installation. Table 3.9-1 lists these plans. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.9-1 Regulatory Setting for Visual Resources

Law, Regulation, or Guidance
NAVBASE Kitsap-Bremerton Installation Development Plan
NAVBASE Kitsap-Bremerton Area Development Plan
NAVBASE Kitsap Installation Appearance Plan

Sources: Navy 2018, 2016

3.9.2 Affected Environment

Visual resources are defined collectively as natural landforms, vegetation, water features, and human--built features that give the landscape within an area its visual character and quality. Natural views include those of mountains, seascapes, and shorelines. Built views include those of buildings and infrastructure, landscaping, and parks. Existing landscapes that could be affected by the project and the visual resources that compose those landscapes include both natural and built features.

For this analysis, views are described in terms of foreground (less than 0.25 mile), middle ground (0.25 mile to 3 miles), and background (greater than 3 miles). Visual resources are further defined by the following:

- Dominant landscape features
- Diversity
- Elements of line, color, form, and texture
- Historic importance
- Overall landscape character

3.9.2.1 Existing Conditions

NAVBASE Kitsap-Bremerton

The ROI for visual resources consists of locations where physical changes would occur within NAVBASE Kitsap-Bremerton as well as areas from where these locations would be seen. The ROI encompasses Sinclair Inlet; Port Orchard Bay; the towns of Port Orchard and Manette (East Bremerton) and the city of Bremerton; and PSNS & IMF at NAVBASE Kitsap-Bremerton. The ROI for visual resources comprises areas where elements of the project could be seen from public vantage points, including along several ferry routes in Sinclair Inlet and the Bremerton Ferry Terminal (Seattle-Bremerton and Port Orchard-

Bremerton), Bachmann Park, several notable vista points, the Port Orchard Public Boat Launch, and the Port Orchard Waterfront Bicycle Path (Figure 3.9-1).

The waters of Sinclair Inlet are home to the naval ships at PSNS & IMF, recreational boats (docked at one of three marinas—two at Port Orchard, one at Bremerton), and commuter ferries. The Manette Bridge spans the Port Washington Narrows between downtown Bremerton and Manette. PSNS & IMF is located across Sinclair Inlet from Port Orchard, approximately 1 mile away. The overall landscape character of the ROI is primarily defined by industrial (associated with PSNS & IMF) and residential (associated with Bremerton and Port Orchard) development and the natural environment.

Both Bremerton and Port Orchard have a gentle topographical rise from sea level to about 200 feet and include bluffs that are interspersed with the residential buildings and the contrasting greens of conifers in parks and green spaces. The Hammerhead Crane located in PSNS & IMF is identified as an iconic landmark well known throughout the area and visible from many locations along Sinclair Inlet. In addition to the Hammerhead Crane, the industrial shipyard also includes some of the installation's oldest structures and resources.

Key Observation Points

Eleven KOPs were established as representative viewing locations of the potentially affected landscape (Figure 3.9-1 and Figure 3.9-2). Each KOP is accessible to the public. Collectively, views experienced from the KOPs provide a representation of the characteristic landscape and its visual quality that could be affected by the project as viewed by the public.

The Navy selected eight KOPs to present views from representative viewing locations toward the waterfront of the project site. One KOP is located next to the installation at the Washington State Ferry Terminal, two KOPs are on ferry routes, one KOP is located across Port Orchard Bay at a public park in Bremerton, and four KOPs are located across Sinclair Inlet in Port Orchard. Table 3.9-2 describes existing views from each of these KOPs toward the project site and shows the views from each of the eight KOPs according to the viewing direction depicted in Figure 3.9-1.

The Navy also selected three KOPs to present views from representative viewing locations toward the storage facility. One KOP is located at the Burwell Steet and Warren Avenue intersection, one KOP is located at the Burwell Steet and Park Avenue intersection, and one KOP is located at the Warren Avenue Parking Lot #96. Table 3.9-3 describes existing views from each of these KOPs toward the project site and shows the views from each of the three KOPs according to the viewing direction depicted in Figure 3.9-1.

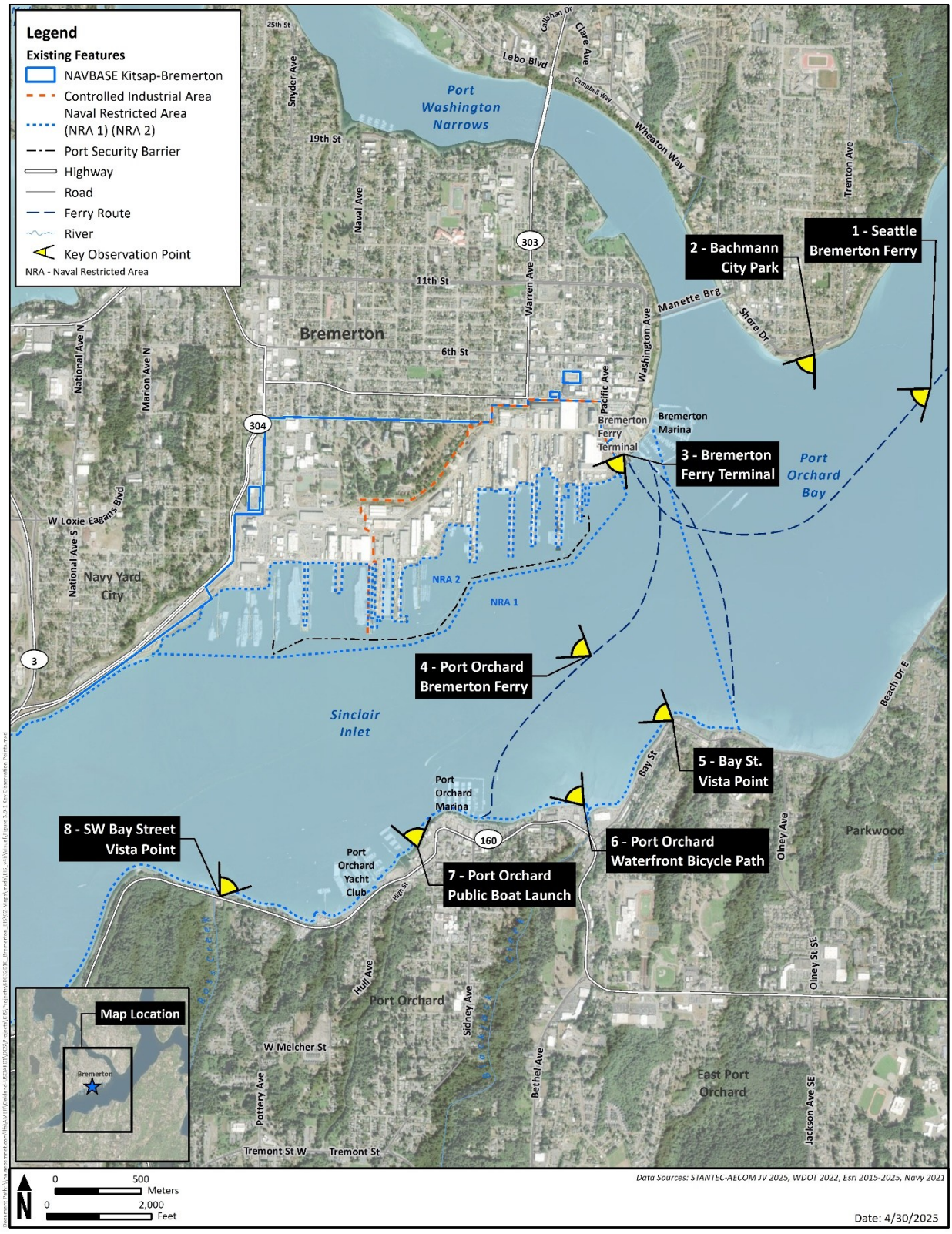


Figure 3.9-1 Key Observation Points Looking toward the Waterfront ROI

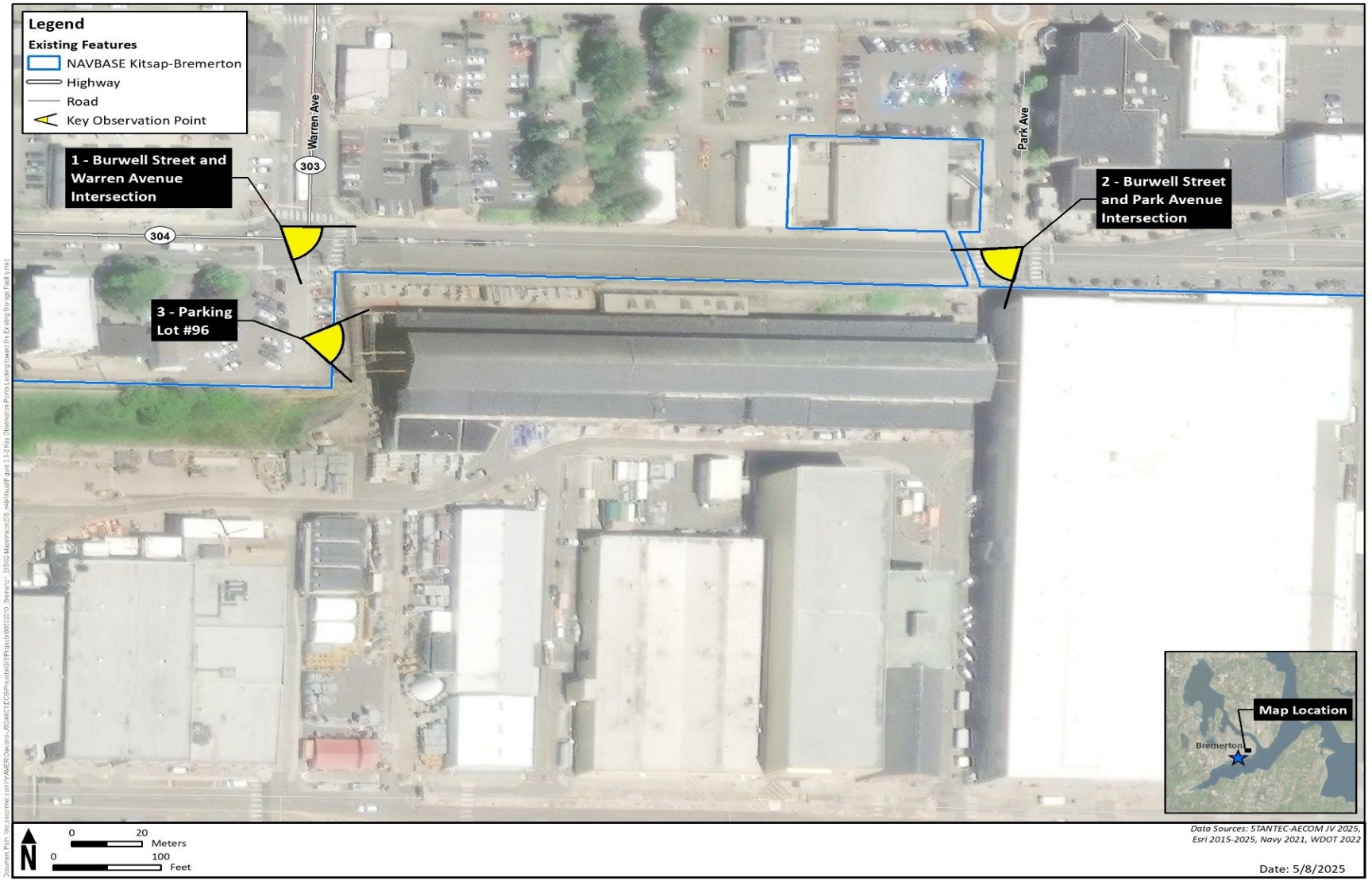


Figure 3.9-2 Key Observation Points Looking toward the Existing Storage Facility

Table 3.9-2 Views toward the Waterfront ROI from Key Observation Points

KOP	*Description of Existing Views Toward ROI at NAVBASE Kitsap-Bremerton*	*Viewer at KOP*
V1	Views from KOP V1 represent those experienced from individuals traveling to Bremerton on the Seattle-Bremerton Ferry in Sinclair Inlet. The overall view is characterized by the open water of Sinclair Inlet in the foreground. In the middle ground, a mass of operations buildings, Piers 3 through 7, cranes, and ships of PSNS & IMF introduce a variety of geometric shapes that appear light in color and attract visual attention. Numerous cranes add vertical and diagonal lines to the landscape that extend above the buildings. PSNS & IMF Hammerhead Crane at Pier 6 is a dominant feature in the landscape due to its scale, color (green), and unique form, which differentiates it from the white and light grey appearance of adjacent structures. As the ferry moves past Manette Peninsula, the Hammerhead Crane first comes into view and draws attention from the viewer. The shoreline appears as a light tan band of sand that separates the water from the developed shoreline. The green, densely forested Blue Hills provide an undulating background that extends for the entire angle of view. **KOP V1: Seattle-Bremerton Ferry Looking Southwest**	Commuters and the public traveling toward Bremerton on the Seattle-Bremerton Ferry

KOP	*Description of Existing Views Toward ROI at NAVBASE Kitsap-Bremerton*	*Viewer at KOP*
V2	Views from KOP V2 represent those experienced from Bachmann Park, a 0.15-acre park with an over-water viewing shelter and beach access on Sinclair Inlet. Views directed southwest include Sinclair Inlet and the pebbled beach and rocks of Bachmann Park when the tide is low in the foreground. The shipfitter-welder shop, Hammerhead Crane, Piers 6 and 7 and any associated ships docked there, portal cranes, are all visible. Generally, these structures visually appear as a mass of industrial development composed of rectangular buildings and vertical and diagonal lines. The Hammerhead Crane is the most prominent feature of the viewshed and attracts the viewer's eye. It stands out because of its large scale, unique "T" shape, lattice structure, and physical separation from other development along the shoreline visible from this KOP. The shipfitter-welder shop is also a prominent feature in the viewshed due to its substantial mass and height that blocks views of the distant hillsides. The view is backdropped by the densely forested hills of Port Orchard to the southwest and Blue Hills to the west. **KOP V2: Bachmann Park Looking Southwest**	Public using Bachmann Park, looking southwest toward PSNS & IMF

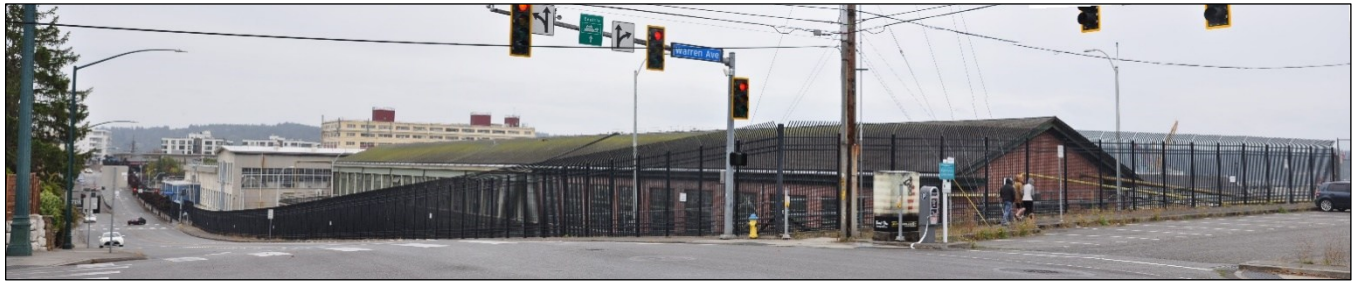
KOP	*Description of Existing Views Toward ROI at NAVBASE Kitsap-Bremerton*	*Viewer at KOP*
V3	Views from KOP V3 represent those experienced from the Bremerton Ferry Terminal, located at the northeastern-most end of the NAVBASE Kitsap-Bremerton operations area. Views of Sinclair Inlet to the south and west and PSNS & IMF to the west are partially obstructed by the ferry offloading and covered pedestrian walkway and the small Harborside Fountain Park located just east of the ferry terminal in the foreground. The shipfitter-welder shop, a large rectangular building, and the Hammerhead Crane are the visible features of PSNS & IMF from this KOP. The dominant colors include the light tan and blue associated with the shipfitter-welder shop, and the green hue of the Hammerhead Crane. Sinclair Inlet is visible in both the foreground and middle ground, generally appearing as a wide, flat uniform surface. **KOP V3: Bremerton Ferry Terminal Looking Southwest**	Public and commuters as they board, disembark, or wait for the Seattle-Bremerton Ferry
V4	Views from KOP V4 represent those experienced from individuals traveling aboard the Port Orchard-Bremerton Ferry, generally looking northwest toward PSNS & IMF. The flat, expansive, uniform water surface of Sinclair Inlet defines the foreground. The industrial buildings, cranes, ships, and piers of PSNS & IMF appear as a light-colored band of various textures and geographic shapes with several vertical and diagonal lines extending above the rooflines, skylined in some instances and in others backdropped by a band of green conifers. The Hammerhead Crane is visible in the middle ground to the west-northwest and is a prominent visual feature due to its green color, size, large jib that is visible above the tree line, and lattice structure that differentiates it from other structures in PSNS & IMF. **KOP V4: Port Orchard-Bremerton Ferry Looking Northwest**	Commuters and the public traveling in either direction on the Port Orchard-Bremerton Ferry

KOP	*Description of Existing Views Toward ROI at NAVBASE Kitsap-Bremerton*	*Viewer at KOP*
V5	Views from KOP V5 represent those experienced from individuals parked at a small pull-off where Beach Drive East turns south to Bay Street on Mitchell Point and are also representative of those experienced by roadway travelers heading west on Beach Drive East. This KOP affords unobstructed views of the entire PSNS & IMF from across Sinclair Inlet in Port Orchard. Views are very similar to those experienced from KOP V4, except from a greater distance (approximately 0.4 mile [0.6 kilometer] farther). **KOP V5: Bay Street Vista Point Looking Northwest**	Roadway travelers heading west along Beach Street Drive East and those stopped at a pull-off at the same location
V6	Views from KOP V6 represent those experienced from the Port Orchard Waterfront Bicycle Path and adjacent play area. A boardwalk also exists in this area where similar views would be experienced. Sinclair Inlet is also a major aspect of the view, dominating the foreground. From this distance, the shipyard appears as a mass of geometric shapes and vertical and diagonal lines with a variety of colors, although the overall colors of the shipyard structures at this distance appear primarily as light grey and white. Individual buildings can be differentiated, with the Hammerhead Crane appearing most prominent, particularly the jib of the crane that extends above the horizon. **KOP V6: Port Orchard Waterfront Bicycle Path Looking Northwest**	Individuals using the Port Orchard Waterfront Bicycle Path, boardwalk, or nearby play area

KOP	*Description of Existing Views Toward ROI at NAVBASE Kitsap-Bremerton*	*Viewer at KOP*
V7	Views from KOP V7 represent those experienced from the Port Orchard Public Boat Launch. From this KOP, looking north across Sinclair Inlet toward PSNS & IMF, the view from KOP V7 consists largely of Sinclair Inlet in both foreground and middle ground. The three naval ships directly across from the marina are the beginning of the grey, white, and tan features of PSNS & IMF visible from the KOP. The ship masts, cranes, smokestack, and cell phone/radio towers are prominent linear features that contrast against the geometric shapes of other development in PSNS & IMF and the conifers in the background. **KOP V7: Port Orchard Public Boat Launch Looking North**	Recreational boaters as they launch or dock their boats or load up their vehicles
V8	Views from KOP V8 represent those experienced from travelers heading east along Southwest Bay Street on vista point and anyone stopped at a small pull-off in the same location. The entire shoreline of PSNS & IMF is visible, as well as the opening to Port Washington Narrows. Sinclair Inlet dominates the foreground. The smokestack on Building 550 attracts the eye as it extends above the green forested horizon. The ship masts on the naval ships, as well as several portal cranes, are also skylined and provide vertical lines that contrast against the green forested background. The Hammerhead Crane is visible from KOP V8 but does not dominate the scene. **KOP V8: Southwest Bay Street Vista Point Looking Northeast**	Roadway travelers heading east along Southwest Bay Street and those stopped at the vista point pull-off at the same location

Legend: KOP = key observation point; NAVBASE = Naval Base; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; ROI = Region of Influence

Table 3.9-3 Views toward the Storage Facility from Key Observation Points

KOP	*Description of Existing Views of the Storage Facility along Burwell Street*	*Viewer at KOP*
V9	Views from KOP V9 represent those experienced by travelers heading south on Warren Avenue and west on Burwell Street. The foreground is dominated by the black wrought iron fence, signal lights, wooden utility poles, and utility box. The roofline and red brick façade of the west end of the storage facility is also visible in the foreground. The wrought iron fence draws the eye along the property and the green façade of the storage facility is visible in the middle-ground.  **KOP V9: Burwell Steet and Warren Avenue Intersection, Looking Southeast**	Travelers heading south on Warren Avenue and west on Burwell Street
V10	Views from KOP V10 represent those experienced from the Burwell Street and Park Avenue intersection. The two-story storage facility and associated black wrought iron fence are present in the foreground. The first floor consists of a red brick façade while the second story consists of a green façade with large pane glass windows. The wrought iron fence draws the eye along the length of the building. **KOP V10: Burwell Steet and Park Avenue Intersection, Looking Southwest**	Travelers heading south on Park Avenue and west on Burwell Street

KOP	*Description of Existing Views of the Storage Facility along Burwell Street*	*Viewer at KOP*
V11	Views from KOP V11 represent those experienced by travelers parking their cars at the Warren Avenue Parking Lot #96 and anyone traveling to the parking lot along Warren Avenue. The black wrought iron fence is dominant in the foreground. The roofline, yellow pipeline, and red brick façade of the west end of the storage building is visible in the middle-ground and background. **KOP V11: Warren Avenue Parking Lot #96, Looking East**	Travelers parking their cars at Lot #96

Legend: KOP = key observation point

Sensitive viewers are considered members of the public who would be sensitive to landscape changes. Residents value or are accustomed to the landscape, and individuals recreating in the area or tourists may seek out a specific view. Views from scenic vantage points may be focal to the viewer's experience and therefore considered sensitive and of heightened importance. The views described in Table 3.9-2 represent locations where sensitive viewers may view the project.

NAVBASE Kitsap-Bangor

NAVBASE Kitsap-Bangor is an active military installation located on the eastern shoreline of Hood Canal. The topography is characterized by flat-topped ridges on the eastern, northern, and southern portions of the installation. The shoreline of Hood Canal lies adjacent to steep ravines and hillsides leading to the upper portions of the installation. The Olympic Mountains lie to the west and provide a scenic backdrop for the installation.

Much of NAVBASE Kitsap-Bangor is undeveloped with large stands of coniferous trees. Interspersed within the conifers are office buildings, residences, industrial facilities, and other structures used to support military operations. For views of NAVBASE Kitsap-Bangor from off-installation locations, the installation blends well with the surrounding area because much of it is forested and hidden from view and is compatible with the surrounding rural landscape (Navy 2023). The prevalent view of NAVBASE Kitsap—Bangor is from the west looking east across Hood Canal to the wharves and piers of the waterfront (Navy 2023).

The ROI for visual resources comprises areas where elements of the expanded mission support area (Radio Hill complex) or new forge shop (Alternative 2 only) would be seen from on-installation vantage points, including Thresher Avenue, Trigger Avenue, and surrounding facilities such as the Branch Education Health Center and Naval Hospital Education Center. There are no public vantage points with views of the mission support area (Radio Hill complex) or new forge shop site due to public access restrictions, topography, and landscape conditions. Potential viewers would consist of military personnel and authorized visitors to the installation.

As shown in Figure 3.9-3, the existing laydown yard consists of industrial buildings and storage of various materials and equipment that are consistent with the industrialized character of the installation. The existing mission support area (Radio Hill complex is surrounded by dense, mature conifers that separate the area from viewers (i.e., military personnel and authorized visitors).

As shown in Figure 3.9-3, the new forge shop (Alternative 2 only) and existing mission support area expansion would be constructed upland currently consisting of and surrounded by dense, mature conifers.

Figure 3.9-3 New Forge Shop (Alternative 2 only) and Existing Mission Support (Radio Hill complex) Expansion at NAVBASE Kitsap-Bangor

3.9.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Table 3.9-4 summarizes the effects to visual resources associated with RFFAs with a close causal relationship to the project.

Table 3.9-4 Effects to Visual Resources from Reasonably Foreseeable Future Actions – NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy –Pier 3 Electrical Substation Repair, PSNS & IMF	RFFA located within PSNS & IMF and within viewshed of the Proposed Action.	This RFFA is located within areas of PSNS & IMF where project activities associated with the Proposed Action would occur. Visual change to PSNS & IMF from this RFFA and the Proposed Action may be visible from viewing locations in Sinclair Inlet.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF, and NAVBASE Kitsap-Manchester	RFFA located within PSNS & IMF and within viewshed of the Proposed Action.	This RFFA is located within areas of PSNS & IMF where project activities associated with the Proposed Action would occur. Visual change to PSNS & IMF from this RFFA and the Proposed Action would not be visible from viewing locations in Sinclair Inlet once maintenance and replacement activities are complete.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	None. The RFFA is outside of the viewshed of the Proposed Action. NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	None.
Navy – SIOP, PSNS & IMF	RFFA located within PSNS & IMF and within viewshed of the Proposed Action.	This RFFA is located within areas of PSNS & IMF where project activities associated with the Proposed Action would occur. Visual change to PSNS & IMF from this RFFA and the Proposed Action may be visible from viewing locations in Sinclair Inlet during construction and operation.
Navy – Operable Unit B Marine Source Removal Actions	RFFA located within PSNS & IMF and within viewshed of the Proposed Action.	This RFFA is located within areas of PSNS & IMF where project activities associated with the Proposed Action would occur. Visual change to PSNS & IMF from this RFFA and the Proposed Action would not be visible from viewing locations in Sinclair Inlet once remedial actions are complete.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	None. The RFFA is outside of the viewshed of the Proposed Action. NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	None.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	RFFA located within PSNS & IMF and within the viewshed of the Proposed Action.	This RFFA is located within areas of PSNS & IMF where project activities associated with the Proposed Action would occur. Visual change to PSNS & IMF from this RFFA would not be visible from viewing locations in Sinclair Inlet once remedial actions are complete.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	None. The RFFA is outside of the viewshed of the Proposed Action.	None.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	None. The RFFA is outside of the viewshed of the Proposed Action.	None.
Port of Bremerton - Marina Breakwater Replacement, Port Orchard Marina	The RFFA is within the viewshed of the Proposed Action.	This RFFA and the Proposed Action may be visible from viewing locations in Sinclair Inlet during construction and operation. Once complete, the new breakwaters would not result in a highly noticeable change from the existing structures.
Private Development – The Beacon and Beacon II	The RFFA is within the viewshed of the Proposed Action.	This RFFA and the Proposed Action may be visible from viewing locations in Sinclair Inlet during construction and operation.
Private Development – McWilliams Apartments	None. The RFFA is outside of the viewshed of the Proposed Action.	None.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; RFFA = reasonably foreseeable future action; SIOP = Shipyard Infrastructure Optimization Program

Table 3.9-5 summarizes the effects to visual resources associated with RFFAs with a close causal relationship to the project at NAVBASE Kitsap-Bangor.

Table 3.9-5 Effects to Aesthetics/Visual Resources from Reasonably Foreseeable Future Actions – NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Transit Protection Program Support Facilities	None. The RFFA is outside the ROI and viewshed of the Proposed Action.	None. This RFFA is not located near where the Proposed Action would occur. Some actions associated with this RFFA may be visible to the public from Hood Canal.
Navy – Child Development Center	RFFA located within ROI and viewshed of the Proposed Action.	RFFA actions would be mostly obscured by densely forested surroundings but would be within the context of the existing Child Development Center.
Navy – Military Working Dog Kennel Replacement	RFFA located within ROI and viewshed of the Proposed Action.	Construction and new structures would be visible to on-installation personnel and within the context of the existing Dog Kennel.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Repair Substation 5	None. The RFFA is outside the ROI and viewshed of the Proposed Action.	None. This RFFA is not located near where the Proposed Action would occur. Repairs to existing substation would not be highly noticeable to viewers once completed.
Navy – Tang Road Repair	None. The RFFA is outside the ROI and viewshed of the Proposed Action.	None. This RFFA is not located near where the Proposed Action would occur and would only be visible to on-installation personnel. Upgrades to the existing road would not be highly noticeable once complete.
Navy – Equipment Processing Building	None. The RFFA is outside the ROI and viewshed of the Proposed Action.	None. This RFFA is not located near where the Proposed Action would occur and would only be visible to on-installation personnel.
Navy – Relocate Flier Road	None. The RFFA is outside the ROI and viewshed of the Proposed Action.	None. This RFFA is not located near where the Proposed Action would occur. Some actions associated with this RFFA may be visible to the public from Hood Canal.
Navy – CERCLA actions for PFAS	The RFFA is base wide and could be within the viewshed of the Proposed Action.	None. Remedial CERCLA actions would not be visually noticeable once complete.
Navy – CERCLA Operable Unit 1 Site A	None. The RFFA is outside the ROI and viewshed of the Proposed Action.	None. This RFFA is not located near where the Proposed Action would occur and actions would be obscured from almost all vantage points due to thick forested surroundings.
Navy – CERCLA Operable Unit 2 Site F	The RFFA is near the ROI and viewshed of the Proposed Action	RFFA actions would be mostly obscured by densely forested surroundings and only visible only to on-installation personnel.
Navy – Alternate Power Transmission Line	None. The RFFA is outside the ROI and viewshed of the Proposed Action.	None. This RFFA is not located near where the Proposed Action would occur. Transmission infrastructure may be visible to on and offsite personnel, but would not be a highly out of context visual change.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; PFAS = per and polyfluoroalkyl substances; RFFA = reasonably foreseeable future action; ROI = Region of Influence; UXO = unexploded ordnance

3.9.3 Environmental Consequences

The evaluation of visual resources in the context of environmental analysis typically addresses the contrast between visible landscape elements. Collectively, these elements comprise the aesthetic environment, or landscape character. Evaluation of the environmental consequences on landscape character looked at whether the results of the Proposed Action of demolishing existing facilities and constructing new facilities are compatible or incompatible with the landscape character. See Section 3.6 for related environmental consequences associated with alteration of the historic setting that would result in impacts to cultural resources. In particular, Section 3.6 discusses those impacts that would adversely affect cultural resources associated with historic properties and historic viewshed KOPs pursuant to NHPA Section 106. In the following visual analysis, the reference to historic structures is related only to the longevity of that element as part of the visual environment, not an official designation or cultural resource (See Section 3.6, Cultural Resources for discussion specific to historical or cultural significance).

Detailed visual resources analyses, including visual photo simulations, can be found in Appendix M. This section discusses the potential short- and long-term effects to visual resources that could result from implementation of the action alternatives and the no-action alternative. The effects analysis evaluated the potential for beneficial or adverse impacts in consideration of BMPs presented in Table 3.9-6 (also see Appendix A). The BMPs are measures that the Navy would implement to reduce the environmental impacts of designated activities, functions, or processes.

Table 3.9-6 Visual Resources Best Management Practices

BMP	*Title*	*Applicability*
VIS MGMT-BREM-1 VIS MGMT-BANGOR-1	• Exterior lighting shall be energy efficient and shielded or recessed so that direct glare and reflections shall be confined, to the maximum extent feasible, within the boundaries of the site. • Industry standards for recommended lighting levels shall be followed to prevent over-lighting.	Operation
VIS MGMT-BREM-2	Construction lighting during nighttime construction activities shall be confined, to the maximum extent feasible, within the boundaries of the site to minimize impacts on aquatic life.	Construction
VIS MGMT-BREM-3	New facilities shall be painted/treated using a color palette consistent with existing facilities at the shipyard. This shall include using grays for the M2D2, DD3, and other ancillary facilities.	Construction

Legend: BMP = best management practice; DD = dry dock; M2D2 = multi-mission dry dock

3.9.3.1 Impact Assessment Methodology

The methodology for analysis of visual impacts in this Environmental Impact Statement uses concepts from *Manual H-8410-1–Visual Resource Inventory* (BLM 1986a) and *Manual 8431 – Visual Resource Contrast Rating* (BLM 1986b).

The methodology for this analysis is as follows:

1. Establish representative KOPs that represent common public viewing areas as well as other viewpoints that allow a comprehensive understanding of the existing landscape within the ROI.
2. Assess the existing landscape from the KOPs identified by evaluating form, line, color, and texture of both natural and human-made elements. Other factors considered when assessing the existing landscape include scale, dominance, and extent of view (enclosed versus panoramic).
3. Prepare photo simulations of the primary project elements of each action alternative from select KOPs.
4. Perform a contrast rating from each KOP, informed by the photo simulations. The contrast rating evaluates how the form, line, color, and texture of the project components contrast against the existing landscape.
5. Consider the following factors when determining the anticipated level of visual contrast:
    a. Viewing distance
    b. Relative size of facilities and activities

6. Review potential actions of each action alternative to anticipate the types of impacts it would have on visual resources from each KOP. The following potential impacts are used to assess the visual impacts:
    a. Level of contrast introduced by the project that is detectable from KOPs through an assessment of changes to form, line, color, and/or texture
    b. Degree of impact to scenic quality is based on the level of change of landscape character due to visual contrast introduced by and/or loss of prominent visual/aesthetic resources caused by the Proposed Action
    c. Extent of the visual contrast, degradation of landscape character, and damage/destruction of prominent visual/aesthetic resources

Construction activities would occur over many years with some activities occurring concurrently. Short-term project activities that occur during the construction phases are considered to have no impact or negligible to minor impact on visual resources. Short-term in this context refers to individual construction activity intervals that may last for a period of several months or less. Visual effects in these timeframes change frequently in terms of visual characteristics and locations. Long-term visual effects are permanent changes to the visual characteristics of the site. In this context, those effects are addressed as operational impacts.

The level of long-term impact as viewed from each KOP was assessed for each action alternative. With respect to the long-term effects on the area, the analysis considers the degree to which each proposed alternative permanently impacts the views from each KOP in terms of visual contrast (Table 3.9-7) and visual changes to the existing scenic quality of the landscape (Table 3.9-8). In addition to the visual changes resulting from the Proposed Action, the visual environment may also be altered due to independent separate actions, such as RFFAs or other actions that modify visible features.

Table 3.9-7 Degree of Visual Contrast Defined

Degree of Visual Contrast	*Definition*
None	The element contrast is not visible or perceived.
Weak	The element contrast can be seen but does not attract attention.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

Source: BLM 1986b

Table 3.9-8 Degree of Visual Impact Defined

Degree of Visual Impact	*Definition*
None	No discernible or measurable visual contrast.
Negligible	Impacts that would not diminish the scenic quality of the landscape.
Minor	Impacts that diminish the scenic quality of the landscape to a minimal degree and are potentially noticeable when viewed from sensitive viewpoints.
Moderate	Impacts that would diminish the scenic quality of the landscape and would easily be noticeable from sensitive viewpoints.
Major	Impacts resulting from construction disturbances and the long-term presence of new or absence of existing facilities would substantially alter the scenic value of the landscape and would dominate views from sensitive viewpoints.

Photo simulations of KOPs with views toward PSNS & IMF at NAVBASE Kitsap-Bremerton were prepared that incorporated the proposed permanent facilities and infrastructure into the photos (Appendix M).

3.9.3.2 Impact Analysis for Alternative 1: No-Action

Under Alternative 1, the Proposed Action would not proceed. The Navy would continue to maintain, repair, and operate existing facilities. Views from the identified KOPs would remain the same as discussed under Section 3.9.2.1. Over time, buildings and facilities would continue to age and the docking of ships at the piers and moorings would vary based on future operational needs and the ability of the existing facilities to support those needs. While the appearance of the existing facilities and ongoing operations may vary and change, the overall visual environment would remain similar and in context with the existing aesthetic. Therefore, under the no-action alternative, no new visual contrast and minor impacts to visual resources would occur.

3.9.3.3 Impact Analysis for Alternative 2 (Preferred Alternative)

The Alternative 2 project area includes construction and operation conducted within the NAVBASE Kitsap-Bremerton Controlled Industrial Area and Naval Restricted Area and the area of the new forge shop at NAVBASE Kitsap-Bangor.

Construction-related Impacts

Alternative 2 would include the demolition of structures with historic longevity and prominence in the visual environment as well as construction of a new M2D2 at DD3, construction of a new Pier 2, and demolition of Piers 4,6, and 7 with replacement of Pier 4. Materials storage and staging activities would occur at and around PSNS & IMF facilities as well as on barges and offsite. Dredging equipment, in-water activities, and construction of new facilities would be visible from all KOPs except for KOP V3. During the construction period, the number of vessels/barges traveling in the channels would increase and potentially be noticeable from all KOPs, except KOP V3. Given the industrial surroundings and the temporary nature of the construction work occurring only during discrete construction phases, there would be minimal impact on the scenic quality of the channel waters. Therefore, construction activities would have negligible impacts on visual resources from KOPs at a greater viewing distance from PSNS & IMF (KOPs V1, V6, and V7), minor impacts at a closer viewing distance (KOPs V2, V4, and V5), and no impacts on visual resources at KOP 3.

During construction, the Navy would install approximately 18 temporary mooring buoys (each approximately 14 feet in diameter) in a nearby location (to be determined) to support construction of M2D2. The temporary mooring buoys would be installed in pairs and configured to moor two barges side by side. While the buoys would be visible, their prominence on the water would be related to the viewing distance. Buoys within the waterfront visual environment are not out of context and would represent a negligible visual impact. The buoys would be removed at the completion of construction.

Construction activity lighting may temporarily increase the level of nighttime light; however, the change would be minor with the implementation of BMPs to confine lighting to the maximum extent feasible within the boundaries of the site (see Appendix A, BMP VIS MGMT BREM-1) and because PSNS & IMF is already well lit at night. Construction activities at NAVBASE Kitsap-Bremerton are anticipated to have negligible to minor impacts on visual resources.

In addition, a new forge shop would be constructed at NAVBASE Kitsap-Bangor, and the mission support area at Radio Hill complex would be expanded. The existing mission support area is surrounded by dense, mature conifers that separate the area from viewers (i.e., military personnel and authorized

visitors). The public does not have access to view the area of the proposed facility. Construction activities at NAVBASE Kitsap-Bangor, therefore, are anticipated to have no impact on visual resources.

Operation-related Impacts

Operation-related impacts to visual resources specific to Alternative 2 are summarized for each applicable KOP in Table 3.9-10. Associated operation-related impacts would result in a change in landscape character due to the removal of structures with a historic presence in the visual setting, including Hammerhead Crane, shipfitter-welder shop, DD3, Piers 6 and 7 and their associated facilities; Alternative 2 would introduce new dominant visual elements, primarily centralized around the new M2D2 at DD3. The replacement of Pier 4 with a new pier, and the new and large-scale M2D2, would be consistent with the shipyard's historic industrial and dynamic shoreline setting of multiple piers and moorings that characterize the aesthetic of the area. In addition, the Ford-class carrier(s), which would be larger than ships currently docked at DD3, would periodically be docked at the new M2D2 (Table 3.9-9).

Because of the long viewing distance and viewing angle, the project elements would not be visible from KOP V8. Therefore, no photo simulations were prepared for KOP V8, and no impacts to KOP V8 are described in the following analysis. Appendix M provides photo simulations from the other KOPs for both action alternatives.

Table 3.9-9 Impacts to Views Toward ROI from Key Observation Points under Alternative 2

KOP	*Level of Visual Contrast*	*Visible Changes in Landscape Character*	*Loss of ProminentVisual Resources*
V1	Moderate to strong	The facilities would be barely discernible from this KOP due to the long viewing distance. As the ferry gets closer to its Bremerton berth, any new facilities, and the Ford-class carrier(s), when periodically present, would be more discernible but consistent with the existing shipyard and industrial landscape character.	The absence of the prominent Hammerhead Crane would be a moderate visual change from this KOP and its noticeable absence would increase as the viewer on the ferry approaches the Bremerton ferry berth. Thus, there would be a loss of a prominent visual resource and a moderate to major impact to visual resources depending on the ferry's location in proximity to Bremerton and the view angle. The absence of other historic or prominent facilities would not be seen at a long viewing distance from this KOP but would be more noticeable closer to the Bremerton Ferry Terminal.

KOP	*Level of Visual Contrast*	*Visible Changes in Landscape Character*	*Loss of ProminentVisual Resources*
V2	Strong	Removal of the Hammerhead Crane and the shipfitter-welder shop would result in a major change to the landscape character from this KOP at Bachmann Park because the crane is a prominent visual feature due to its large scale, unique "T" shape, lattice structure, and physical separation from other development and the shop's large mass is substantial and blocks distant hillside views. Without these structures, the distant views towards the hills and skyline in the background would be less obscured. Additionally, a discernible change to the landscape character from this KOP would occur because the M2D2 and the Ford-class carrier(s), when periodically present, would be prominent visual features, and removal of historic facilities would be noticeable.	The absence of the Hammerhead Crane and the shipfitter-welder shop would be noticeable and a prominent visual change from this KOP. The absence of historic facilities, in particular Pier 7 and historic facilities associated with Piers 6 and 7, would be noticeable and a prominent visual change from this KOP. Thus, there would be loss of a prominent visual resource, resulting in a major impact to visual resources.
V3	Strong	Removal of the Hammerhead Crane would result in a major change to the landscape character from this KOP at the Bremerton Ferry Terminal because it is a prominent and noticeable visual feature. Other facilities would not be visible from KOP V3 because of the trees and vegetation in the foreground.	The absence of the Hammerhead Crane would be noticeable and a prominent visual change from this KOP. Thus, there would be loss of a prominent visual resource and a major impact to visual resources. The removal of historic facilities would not be visible from this KOP.
V4	Moderate to Strong	At this KOP, the changes to landscape character would be moderate because the visual changes would be discernible but not dominant. The facilities would be discernible from this KOP, but as the ferry gets closer to its Bremerton berth, any new facilities, and the Ford-class carrier(s), when periodically present, would be more discernible but consistent with the existing shipyard and industrial landscape character.	The absence of the Hammerhead Crane would be a moderate visual change from this KOP and would be strong as the viewer on the ferry approaches the Bremerton ferry berth. Thus, there would be a loss of a prominent visual resource and a moderate to major impact to visual resources depending on the ferry's location in proximity to Bremerton and the view angle.
V5	Moderate	This is the primary view traveling southwest on Bay Drive toward Port Orchard. Removal of the Hammerhead Crane would be discernible leading up to and from this KOP because of the viewing angle. Other facilities would be discernible from this KOP but would be consistent with the existing industrial landscape character.	The absence of the Hammerhead Crane would be a noticeable but less than prominent visual change from this KOP. Thus, there would be loss of a prominent visual resource and moderate impact to visual resources. The absence of historic facilities would be visible but less noticeable from this KOP because of a longer viewing distance.

KOP	*Level of Visual Contrast*	*Visible Changes in Landscape Character*	*Loss of ProminentVisual Resources*
V6	Moderate	This is the primary view traveling southwest on Bay Drive toward Port Orchard. Removal of the Hammerhead Crane would be discernible leading up to and from this KOP because of the viewing angle. Other facilities would be discernible from this KOP but would be consistent with the existing industrial landscape character.	The absence of the Hammerhead Crane would be a noticeable but less than prominent visual change from this KOP. Thus, there would be loss of a prominent visual resource and moderate impact to visual resources. The absence of historic facilities would be visible but less noticeable from this KOP because of a longer viewing distance.
V7	Weak	Because of the long viewing distance and viewing angle, the Hammerhead Crane is not visible from this KOP and its removal would not be noticeable. The facilities would not be visible from this KOP because of the viewing distance and viewing angle.	Because of the long viewing distance and viewing angle, the Hammerhead Crane is not visible from this KOP. The absence of historic facilities would be visible but less noticeable from this KOP because of a longer viewing distance, resulting in a negligible impact to visual resources.

Legend: KOP = key observation point; M2D2 = multi-mission dry dock

The Hammerhead Crane is a prominent visual feature due to its green color, its size, a large jib visible above the tree line, and a lattice structure that distinguishes it from the other structures in PSNS & IMF. It is visually prominent from KOPs V2, V3, and V5 and visible in the distance from KOPs V1, V4, and V6. With its removal, the loss of a prominent visual resource would lead to moderate to strong visual contrast at these KOPs, depending on the viewing angle and distance. Moderate to major impacts to visual resources would be caused by the loss of the historically prominent Hammerhead Crane at KOPs V1 to V6. Because of the long viewing distance and viewing angle, the Hammerhead Crane is not visible from KOP V7.

The shipfitter-welder shop is a prominent mass within certain views, such as KOP V2 and its removal would alter the viewshed from certain angles and KOPs. With the height and mass of the structure gone after demolition, views to the background horizon of skyline and hillsides would be opened up and less obscured.

The new Pier 4 would replace the existing one. It would be in the same location and would be comparable in size (1,400 feet long by 132 feet wide compared to 1,423 feet long by 80 feet wide for the existing Pier 4) and character. Therefore, the new Pier 4 is not expected to result in any discernible changes to the viewshed or views from any of the KOPs.

DD6 is visible in KOPs V1 and V2 but is not visually prominent from these KOPs because of the viewing distance and surrounding industrial facilities. With the demolition of the existing facilities, the construction of new replacement facilities would be required to support DD6. The new facilities are anticipated to have an updated but similar industrial appearance and would be consistent with the current landscape character in PSNS & IMF, resulting in no visual impact.

The large, rectangular-shaped structure of the new M2D2 would visibly deviate from the surrounding infrastructure primarily because of its mass and scale. The new M2D2 would be visually prominent from KOP V2; visible in the distance from KOPs V1, V4, V5, and V6; would not be visible from KOP V3 as it would be hidden by deciduous trees and vegetation in the foreground; and would not be visible from

KOPs 7 and 8 due to the viewing distance and viewing angle. Using colors like those on existing facilities in the shipyard would help minimize visual contrast and allow the structure to better blend into the surroundings (see Appendix A, BMP VIS MGMT BREM-2), resulting in minor visual impacts from the new M2D2 structure.

The new M2D2 would provide a facility for the USS Gerald R. Ford-class carrier(s). The Ford-class carrier(s) would be larger than most ships docked at DD3 but about the same size as the Nimitz-class carrier(s), which has been docked at Bremerton in the past. The M2D2 would be located in an area of the shipyard where submarines are currently present. During maintenance of the Ford-class carrier, the carrier's tower may be covered in white wrap for maintenance purposes. Work would occur on scaffolding inside of the wrapped tower. The carrier would visibly deviate from the surrounding infrastructure when wrapped and because of the tower's mass and height compared to Navy vessels that currently use DD3. The Ford-class carrier(s) would be visually prominent especially when wrapped from KOP V2; visible in the distance from KOPs V1, V4, V5, and V6; would not be visible from KOP V3 as it would be hidden by deciduous trees and vegetation in the foreground; and would not be visible from KOPs 7 and 8 due to the viewing distance and viewing angle. The Ford-class carrier(s), when present, would be more discernible but consistent with the existing shipyard and industrial landscape character, resulting in a minor visual impact. Table 3.9-10 compares the Ford-class carrier's dimensions to those of the Nimitz-class carrier. Figure 3.9-4 presents visual simulations from KOP 2 showing the visibility of the larger ship with and without the white wrap from this location (note that the Hammerhead Crane is absent in these simulations because it would have been demolished by the time construction is complete).

Table 3.9-10 Dimensions of the Nimitz-Class Carrier Compared to the USS Gerald R. FordClass Carrier(s)

Key Dimension For Visual Effects Analysis	*Nimitz-Class Carrier Dimensions (feet)*	*Gerald R. Ford-Class Carrier Dimensions (feet)*
Length (bow to stern)	1,092	1,106
Length (bow to stern at the waterline)	1,040	1,040
Beam (widest width at the waterline)	134	134
Flight Deck Width	252	256
Flight Deck Height (design waterline)	55 to 59	61
Tower Height (design waterline)	130 USS Kitty Hawk	134

Note: For reference, the height of the Hammerhead Crane is 250 feet.
Source: Navy 2022

Figure 3.9-4 Visual Simulation of USS Gerald R. Ford Class Carrier(s) with and without Wrapping

The existing storage facility on Burwell Street would be demolished and replaced with a new shipyard support building. The overall footprint of the new structure is expected to be similar to the existing facility; however, the new shipyard support building would be taller than the existing structure. While the new structure height has not been finalized at this time, the building would be 76 to 91 feet tall. As shown in simulations presented in Appendix M , the structure height would result in reduced background views beyond the building, specifically for KOPs 9, 10, and 11. The increased height of the new building would create a visual obstruction and a more closed-in feeling without the ability to see a more distant background view over the structure as a viewer currently can. The new building would appear slightly larger in scale than surrounding structures as it would extend beyond the height of nearby street lighting fixtures and other buildings. The facade and finish for the new shipyard support building are not finalized at this time but are anticipated to be similar in character with existing structures on NAVBASE Kitsap-Bremerton.

In addition to the new shipyard support building construction at NAVBASE Kitsap-Bremerton, the Navy would demolish approximately 30 permanent buildings and utility facilities, and demolish or relocate more than 50 trailers, modular units, sheds, and enclosures. These facility modifications and replacement buildings would generally not be visible from the KOPs because of long viewing distances and viewing angles. Motorists and pedestrians using Charleston Boulevard and adjacent sidewalks near its intersection with Farragut Street would potentially have views of the demolished, relocated, or replaced facilities. The facilities would also be visible from more distant vantage points at higher elevations. These modified or replacement buildings would be similar in character to existing facilities on NAVBASE Kitsap-Bremerton and, while noticeable to nearby viewers, would result in a negligible visual impact. Architectural details are not available for the proposed modified buildings at this time.

Operational lighting would come from M2D2, Pier 2 and 4, and DD6 at NAVBASE Kitsap-Bremerton. Operational lighting would be required to be shielded or recessed to confine glare as outlined in BMP VIS MGMT-BREM-1 (Appendix A). NAVBASE Kitsap-Bremerton is well lit at night and the new or modified operational lighting associated with Alternative 2 would not create a substantial new source of lighting that would be highly noticeable within the existing illuminated nighttime environment.

To replace some PSNS & IMF space and functions lost due to the construction of M2D2, the Navy would permanently expand the existing mission support area (Radio Hill complex) at NAVBASE Kitsap-Bangor. The new buildings would be consistent with the industrial character of other structures that support military operations in NAVBASE Kitsap-Bangor. As discussed in Section 3.9.2.1, there are no off-installation views of the existing mission support area. The existing mission support area is surrounded by dense forest consisting of mature conifers that separates viewers (i.e., military personnel and authorized visitors) from the area. The expanded Radio Hill complex and buildings would continue to be obscured by the forest, and there would be no publicly visible changes to the landscape character. Thus, there would be no visual resources impacts associated with the mission support area at NAVBASE Kitsap-Bangor. The Navy would construct a new forge shop and associated parking area on NAVBASE Kitsap-Bangor. The new structure and parking area would be built in a forested site (see Figure 2-3 in Chapter 2). As discussed in Section 3.9.2.1, there are no off-installation views of the forge shop site and the public does not have access to the proposed facility. The surrounding area is densely forested with mature conifers and separates viewers from the site. Therefore, there would be no visual resources impacts associated with the forge shop at NAVBASE Kitsap-Bangor.

The proposed location of the NAVBASE Kitsap-Bangor forge shop is currently forested, and the forge shop would introduce a new source of light. However, as described above, BMP VIS MGMT BANGOR-1 (Appendix A) would be implemented to downshield lighting and limit the potential for glare. This addition of new lighting would also be blocked by the surrounding forested area and would not result in an intense or highly noticeable new lighting source that is out of character with other nighttime lighting at NAVBASE Kitsap-Bangor. Therefore, changes to the night sky view from operation-related nighttime lighting at NAVBASE Kitsap-Bangor would be minor with the implementation of BMPs (see Appendix A, BMP VIS MGMT BANGOR-1).

Effects Associated with Reasonably Foreseeable Future Actions

For the majority of RFFAs, the action would be viewed from different viewpoints or, if the action occurs in the same location as the Proposed Action, it could take place at a different time. The potential for overlap within the same viewshed between the RFFA and Proposed Action is described in Tables 3.9-4 and 3.9-5. Therefore, combined effects of RFFAs are generally negligible to none.

3.9.3.4 Impact Analysis for Alternative 3

The Alternative 3 project area includes construction and operation conducted within the NAVBASE Kitsap-Bremerton Controlled Industrial Area and Naval Restricted Area and a turning basin within Sinclair Inlet. Where Alternative 3 would include the same action as Alternative 2, the impacts would be the same, and a reference to the analysis under Alternative 2 is provided.

Construction-related Impacts

Construction-related impacts under Alternative 3 would generally be the same as described for most elements under Alternative 2 (Section 3.9.3.3) with the exceptions described and compared below. Under Alternative 3, the degree of visual construction-related impacts would be less than under Alternative 2 because there would be no construction of Pier 2, and no demolition of Piers 6 and 7, compared to Alternative 2. Additionally, a new forge shop would not be built. However, the Navy would construct a new parking garage at the corner of Charleston Boulevard and Farragut Street to replace surface parking that would be lost when new facilities are constructed on an existing surface parking lot. Similar to those described for Alternative 2, construction activities would have negligible to minor impacts on visual resources.

Operation-related Impacts

Under Alternative 3, the degree of visual impacts would be similar but slightly less than under Alternative 2 because there would be no construction of Pier 2 and no demolition of Piers 6 and 7. Alternative 3 would introduce new dominant visual elements, primarily centralized around the new M2D2 and Wharf 2 in the general vicinity of Mooring A. The replacement of Pier 4 with a new pier, and the new and large-scale M2D2, would be consistent with the shipyard's historic industrial and dynamic shoreline setting of multiple piers and moorings that characterize the aesthetic of the area. Potential operational impacts to visual resources under Alternative 3 are described in Table 3.9-11. The visual impact of actions common to both Alternative 2 and Alternative 3 would be the same, such as demolition and replacement of Pier 4, removal of the Hammerhead Crane, and expansion of Radio Hill complex at NAVBASE Kitsap-Bangor. The discussion and analysis of those common elements as described under Alternative 2 are applicable to Alternative 3.

Table 3.9-11 Impacts to Views Toward ROI from Key Observation Points under Alternative 3

KOP	*Level of Visual Contrast*	*Visible Degradation of Landscape Character*	*Loss of Prominent Visual Resources*
V1	Moderate to Strong	Similar to Alternative 2, the changes to landscape character would be moderate because the visual changes would be discernible but not dominant. Changes to the visual landscape would be less than Alternative 2. The facilities would be barely discernible from this KOP due to the long viewing distance. As the ferry gets closer to its Bremerton berth, any new facilities, and the Ford-class carrier(s), when periodically present, would be more discernible but consistent with the existing shipyard and industrial landscape character.	As described for Alternative 2, the absence of the Hammerhead Crane would be a moderate visual change from this KOP and the loss of a prominent visual resource would result in a moderate to major impact. The absence of other facilities would not be seen at a long viewing distance from this KOP but would be more noticeable closer to the Bremerton Ferry Terminal. Thus, impacts to other prominent visual resources would be none to weak.

KOP	*Level of Visual Contrast*	*Visible Degradation of Landscape Character*	*Loss of Prominent Visual Resources*
V2	Strong	As described for Alternative 2, removal of the Hammerhead Crane would result in a major change to the landscape character. Other changes to the visual landscape would be less than Alternative 2. The facilities would be barely discernible from this KOP due to the long viewing distance and viewing angle. Piers 6 and 7 and their associated facilities, which would be demolished under Alternative 2, would remain. Additionally, any discernible facilities or changes such as the relocation of ships from Mooring A to Moorings E, F, and G would be consistent with the existing industrial landscape character of the PSNS & IMF area.	As described for Alternative 2, the absence of the Hammerhead Crane would be noticeable and a prominent visual change, resulting in a major impact to visual resources. Under Alternative 3, there would be fewer facilities demolished or modified, compared to Alternative 2. Thus, there would be less impact to the visual environment.
V3	Strong	Similar to Alternative 2, the absence of the Hammerhead Crane would be noticeable and a prominent visual change, resulting in a major impact. Other affected facilities would not be visible from KOP V3 because of the trees and vegetation in the foreground. No degradation of landscape character is anticipated.	As described for Alternative 2, the absence of the Hammerhead Crane would be a prominent visual change, resulting in a major impact. There would be fewer facilities demolished or modified compared to Alternative 2. Thus, there would be less impact to the visual environment.
V4	Moderate to Strong	Similar to Alternative 2, the facilities would be discernible from this KOP but as the ferry gets closer to its Bremerton berth, any new facilities would be more discernible but consistent with the existing industrial landscape character.	As described for Alternative 2, the absence of the Hammerhead Crane would be noticeable and a prominent visual change, resulting in a major impact. There would be fewer facilities demolished or modified, compared to Alternative 2. Thus, there would be less impact to the visual environment.
V5	Moderate	Similar to Alternative 2, removal of the Hammerhead Crane would be discernible leading up to and from this KOP. Other facilities would be discernible from this KOP but would be consistent with the existing industrial landscape character of the PSNS & IMF area.	As described for Alternative 2, the absence of the Hammerhead Crane would be a noticeable but less than prominent visual change, resulting in a moderate impact. There would be fewer facilities demolished or modified, compared to Alternative 2. Thus, there would be less impact to the visual environment.

KOP	*Level of Visual Contrast*	*Visible Degradation of Landscape Character*	*Loss of Prominent Visual Resources*
V6	Moderate	Removal of the Hammerhead Crane would be discernible but less visually notable from this more distant KOP. Similar to Alternative 2, the facilities would be discernible from this KOP but would be consistent with the existing industrial landscape character of the PSNS & IMF area.	As described for Alternative 2, the absence of the Hammerhead Crane would be a noticeable but less than prominent visual change, resulting in a moderate impact. There would be fewer facilities demolished or modified, compared to Alternative 2. Thus, there would be less impact to the visual environment
V7	Weak	Unlike Alternative 2, the new facilities would introduce the large M2D2 and Wharf 2 and the Ford-class carrier(s), when periodically present, in the middle ground. The discernible facilities viewed from this KOP would be consistent with the existing shipyard and industrial landscape character of the PSNS & IMF area.	The absence of the Hammerhead Crane would not be seen from this KOP. There would be fewer facilities demolished or modified, compared to Alternative 2. Thus, there would be less impact to the visual environment.

Legend: KOP = key observation point; M2D2 = multi-mission dry dock; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility

Under Alternative 3, the M2D2 and Wharf 2 would be the most visually prominent aspects and would be in the center of the Bremerton Waterfront in the location of existing Mooring A. The dimensions of M2D2 would be the same as Alternative 2. Similar to Alternative 2, the new M2D2 provides a facility for the USS Gerald R. Ford class carrier(s). In addition, Alternative 3 would include construction of Wharf 2 adjacent to the M2D2. Wharf 2 would be 1,500 feet long by 90 feet wide, and the wharf deck would be set at +18.6 feet elevation (mean lower low water). The new M2D2 and Wharf 2 would be visible in the distance from KOPs V1, V4, V5, V6, and V7; would be barely discernible from KOP 2; and would not be visible from KOP V3 because of the deciduous trees and vegetation in the foreground or KOP 8 because of the viewing distance and viewing angle, resulting in an overall minor visual impact The degree of impacts from Alternative 3 could be greater than those from Alternative 2 since the M2D2 would be a larger in--water structure located in the center of the Bremerton Waterfront. However, M2D2 in Alternative 3 would be built immediately adjacent to DD6 (an existing large structure) and would not extend farther south than DD6. Using colors similar to existing facilities in the shipyard would help minimize visual contrast and allow the proposed facilities to better blend into the surroundings (see Appendix A, BMP VIS MGMT BREM-2), resulting in minor visual impacts from the proposed facilities. Therefore, visual impacts in some small discrete areas, and as they relate to the change in visual landscape due to loss of prominent or longstanding structures, would be minor and less than under Alternative 2.

Alternative 3 includes relocating existing inactivated, defueled nuclear-powered ships from Mooring A to Moorings E, F, and G. Inactivated ships currently located at Moorings E, F, and G would be displaced and relocated to other suitable locations. The inactive ships at Moorings E, F, and G are visible to motorists driving east on SR 304. Replacing the inactive surface ships with other inactive vessels would be a noticeable difference to motorists but would be consistent with the shipyard character and would result in a negligible impact.

Operational lighting under Alternative 3 would be associated with the new M2D2 and Wharf 2. Changes to the night sky resulting from operation-related nighttime lighting would be minor through the implementation of BMPs requiring downshielding of lighting (see Appendix A, BMP VIS MGMT BREM-1) and because the area is already well lit at night.

Effects Associated with Reasonably Foreseeable Future Actions

For the majority of RFFAs, the action would be viewed from different viewpoints or, if the action occurs in the same location as the Proposed Action, it could take place at a different time. The potential for overlap within the same viewshed between the RFFA and Proposed Action is described in Tables 3.9-4 and 3.9-5. Therefore, combined effects of RFFAs are generally negligible to none.

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3.10 Noise

This discussion of noise includes the types or sources of noise and the associated sensitive receptors in the human environment. Noise in relation to marine and terrestrial biological resources is discussed in Section 3.5 Biological Resources.

Noise is defined as an unwanted or annoying sound that interferes with or disrupts normal human activities. Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. The perception and evaluation of sound involves three basic physical characteristics:

- **Intensity:** The acoustic energy, which is expressed in terms of sound pressure, in decibel (dB)
- **Frequency:** The number of cycles per second the air vibrates, in Hertz
- **Duration:** The length of time the sound can be detected

Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events can be diverse and may be influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the individual. In-depth background information on noise, including its effect on many facets of the environment, is provided in Appendix N.

Basics of Sound and A-Weighted Sound Level

The loudest sounds that can be comfortably heard by the human ear have intensities a trillion times greater than those of sounds barely heard. This vast range means that using a linear scale to represent sound intensity is not feasible. The dB is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level. All sounds have a spectral content, which means their magnitude or level changes with frequency, where frequency is measured in cycles per second or hertz.

Table 3.10-1 provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale. "A-weighted" dB are an expression of the relative loudness of sounds in air as perceived by the human ear. In the A-weighted system, the dB values of sounds at low frequencies are reduced compared with unweighted dB, in which no correction is made for audio frequency. All noise levels presented in this section use A-weighting for impacts to humans but written as 'dB' for brevity.

Table 3.10-1 Subjective Responses to Changes in A-Weighted Sound Levels

Change	*Change in Perceived Loudness*
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic – twice or half as loud
20 dB	Striking – fourfold change

Legend: dB = decibel

A metric is a system for measuring or quantifying a particular characteristic of a subject. Because noise is a complex physical phenomenon, different noise metrics help to quantify the noise environment. The noise metrics used in this EIS are described in summary format below and in a more detailed manner in Appendix N. While the Day-Night Average Sound Level (DNL) and Community Noise Equivalent Level noise metrics are the most commonly used tools for analyzing environmental noise, they apply for all noise events of interest. The DoD utilizes additional metrics and analysis techniques to provide more detailed noise exposure information for the decision process and improve the discussion regarding noise exposure, which includes metrics selected to estimate noise events that interfere with speech, sleep, or classroom learning. The DoD Noise Working Group product, *Improving Aviation Noise Planning, Analysis and Public Communication with Supplemental Metrics* (DoD 2009) was used to determine the appropriate metrics and analysis tools for this EIS.

Equivalent Sound Level (L_{eq})

L_{eq} is a "cumulative" metric that combines a series of noise events over a period of time by averaging the sound energy. The time period specified for L_{eq} typically relates to a type of activity and is presented in parenthesis (e.g., $L_{eq(24)}$ for 24 hours). A 1-hour L_{eq} ($L_{eq(1hr)}$) is most common for construction noise impact analysis, which is used in this study.

Day-Night Average Sound Level

The DNL metric is the energy-averaged sound level measured over a 24-hour period, with a 10 dB penalty assigned to noise events occurring during the period between 10 p.m. and 7 a.m. (often referred to as "acoustic night"). The penalty is assigned because humans perceive noise to be more intrusive at night. DNL values represent the continuous sound level that would be present if all the variations in sound level that occur over a 24-hour period were averaged to have the same total sound energy. Total sound energy excludes the portion of non-sound energy that would occur in the air or water of interest

in order to determine only the acoustic component of energy. The DNL metric does not provide specific information on the number of noise events or the individual sound levels that occur during the 24-hour day. DNL is the standard noise metric used by the U.S. Department of Housing and Urban Development, Federal Aviation Administration, EPA, and DoD. Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments; there is a consistent relationship between DNL and the level of annoyance (see Appendix N). Most people are exposed to sound levels of 50 to 55 dB DNL or higher on a daily basis, and research indicates that about 87 percent of the population is not highly annoyed by outdoor sound levels below 65 dB DNL (Federal Interagency Committee on Urban Noise 1980). Therefore, the 65 dB DNL noise contour is used to help evaluate the compatibility of aircraft operations, road and rail traffic, and marine navigation with local noise sensitive land uses, particularly when noise events occur during the DNL nighttime period.

Maximum Sound Level

The maximum sound level (L_{max}) is the highest integrated sound level measured during a single event in which the sound level changes value with time (e.g., pile driving hammer strike). During a pile strike, the noise level begins at the ambient or background noise level, rises to the L_{max} when the pressure wave of the hammer strike reaches the receiver, and returns to the background level as the pile and equipment vibrations subside. L_{max} defines the maximum sound level occurring for a fraction of a second, which is defined as 1/8 second, and is denoted as "fast" response (American National Standards Institute 1988).

Noise Effects

An extensive amount of research has been conducted regarding noise effects, including annoyance, speech interference, classroom/learning interference, sleep disturbance, effects on recreation, potential hearing loss, and nonauditory health effects. These effects are summarized in Appendix N.

3.10.1 Regulatory Setting

Table 3.10-2 lists relevant laws and regulations related to noise under the Proposed Action addressing federal, county and city regulations. Appendix C lists all applicable federal, state, and local laws and regulations.

Both the Washington State Administrative Code (WAC Chapter 173-60) and Kitsap County Noise Code (Chapter 10.28) define the same maximum permissible A-weighted noise levels ranging from 55 dB to 70 dB based upon the land use category of the properties. The permissible limits are reduced by 10 dB between 10 p.m. and 7 a.m. In this EIS, the A is dropped for all A-weighted noise results for brevity. The maximum permissible environmental noise limit for a residential property is 60 dB due to industrial originating sources during the daytime (7 a.m. to 10 p.m.) while construction noise occurring during the daytime qualifies for exemptions.

The City of Bremerton municipal code mirrors the WAC and Kitsap County noise codes in terms of permissible limits, and the nighttime reduced limit. Exemptions to the City of Bremerton's noise limits include "sounds originating from temporary construction sites as a result of construction activity" occurring between 7 a.m. and 10 p.m. Similarly, the City of Port Orchard describes examples of public noise disturbances and defines daytime exemptions between 7 a.m. and 9 p.m. for "the starting, operations or testing of construction equipment" (Port Orchard Municipal Code 9.24.050). Port Orchard reduces the exemption window to begin one hour later on weekends and holidays, "8:00 a.m. to 9:00 p.m. on Saturday, Sunday, New Year's Day, Martin Luther King Jr. Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving, and Christmas." Port Orchard allows for use of such equipment outside of those hours if specifically approved by the city.

Table 3.10-2 Regulatory Setting for Noise

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
Noise Control Act of 1972	Public Law 92-574, Oct. 27, 1972; 86 Stat. 1234; 42 U.S.C. 4901 et seq.; Amended by PL 94-301, May 31, 1976; PL 95-609, Nov. 8, 1978; PL 100-418, Aug. 23, 1988
Occupational Noise Exposure	29 CFR 1910.95
State	
Washington State Maximum Environmental Noise Levels	Washington Administrative Code Title 173-60
Local	
Kitsap County Noise Code	Kitsap County Code 10.28
Bremerton Municipal Noise Levels	Bremerton Municipal Code 6.32
Port Orchard Public Disturbance Noises	Port Orchard Municipal Code 9.24.050

Legend: CFR = Code of Federal Regulations; NEPA = National Environmental Policy Act; PL = Public Law; U.S.C. = United States Code

No noise measurements were taken as part of this EIS. Field measurements of ambient noise are often not used when assessing potential impacts, when the noise environment can be characterized by use, and the potential for substantial changes from existing conditions can be reasonably determined.

3.10.2 Affected Environment

The study area in the vicinity of NAVBASE Kitsap-Bremerton abuts the City of Bremerton to the north and west (including Navy Yard City to the west), and Sinclair Inlet to the south, with Port Orchard directly across the waterway 0.7 mile away (Figure 3.10-1). The study area in the vicinity of NAVBASE Kitsap-Bangor includes areas near proposed project sites located within the NAVBASE Kitsap-Bangor property (Figure 3.10-2). All of these areas comprise the ROI for noise. This section describes the nearest noise sensitive receptors in the ROI and the existing noise environment. Potential noise sensitive marine and terrestrial species are presented in Section 3.5 Biological Resources and Appendix N.

3.10.2.1 Existing Conditions

Noise sensitive land uses are defined as locations where noise interferes with normal activities associated with their use. Common noise sensitive land uses include residential, educational, health, and religious structures. Figure 3.10-1 depicts noise sensitive receptors in the ROI in the vicinity of NAVBASE Kitsap-Bremerton at the greatest risk of impact due to their proximity to the study area. The residential receptors as shown are representative of nearby residences while the other types of receptors apply to specific properties.

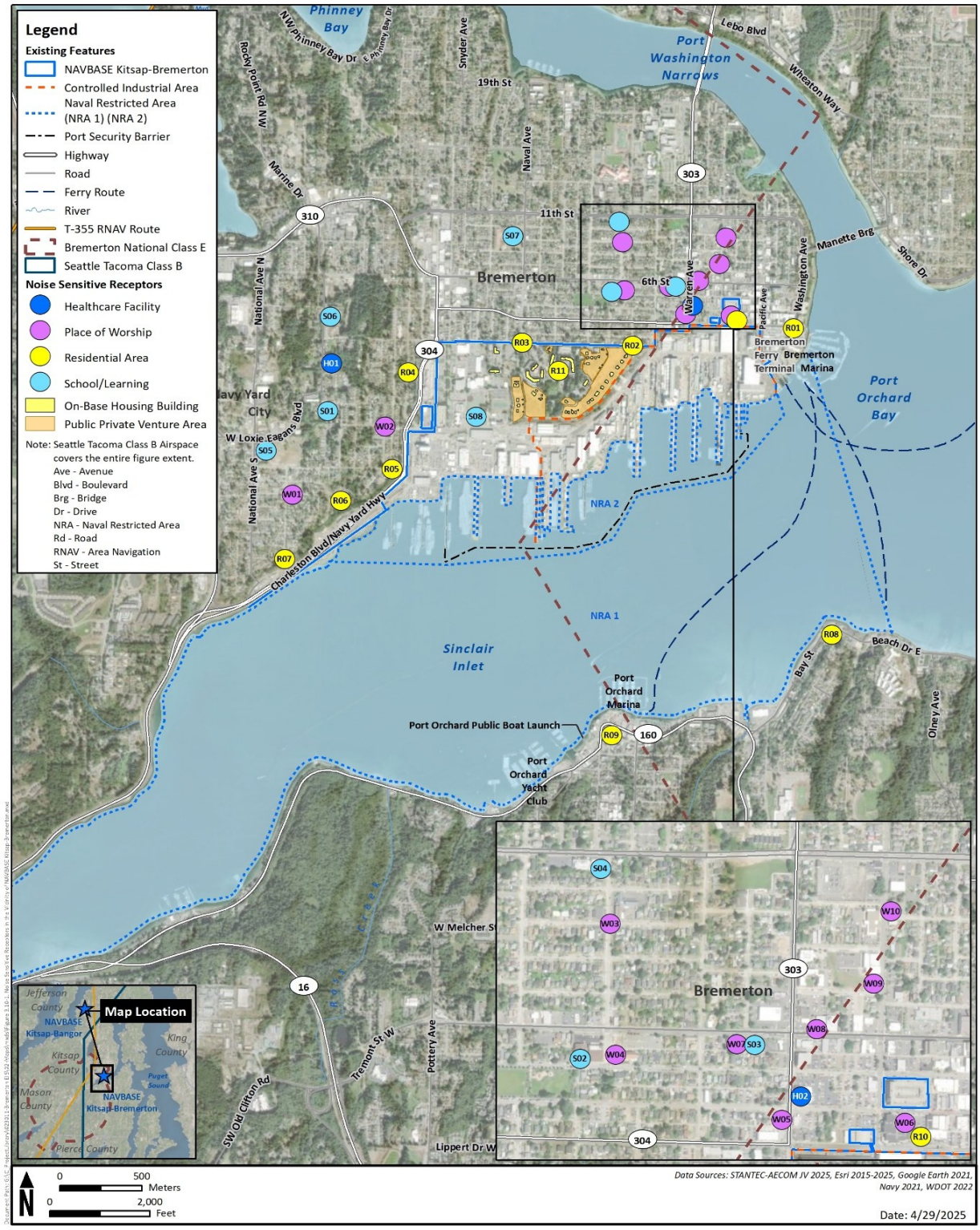

Figure 3.10-1 Noise Sensitive Receptors in the Vicinity of NAVBASE Kitsap-Bremerton

Noise sensitive receptors include on-base housing at NAVBASE Kitsap-Bremerton. The sound environment is affected by ongoing shipyard work and is likely within the range of 60 to 65 dB during the daytime. PSNS & IMF is an active shipyard with ongoing operations 24 hours per day, 7 days per week, and 365 days per year. Noise sensitive receptors in the vicinity of NAVBASE Kitsap-Bremerton in the City of Bremerton include condominiums on Washington Beach Avenue (R01), apartments on Burwell Street (R10), single-family residences along Mahan Avenue (R02 and R03) and west of South Charleston Boulevard (R04 and R05), along with 2 healthcare facilities, 9 schools, and 12 places of worship. These areas comprise Bremerton's Downtown Subarea, District Center Core, and low-density residential areas, representing a range of commercial to residential urban land uses. Road traffic generates the largest source of noise in these environments, with industrial and commerce-related noises and waterway ferries playing a secondary role to noise sensitive receptors in the Downtown Subarea to the east. Navy Yard City, a census-designated dense suburban area, contains three representative residential receptors west of Navy Yard Highway, one school, and two places of worship where road and waterway traffic noise sources dominate. The City of Port Orchard contains two representative residential receptors (R08 and R09), which also serve as sensitive receptors for nearby healthcare, school, and places of worship. Road traffic and waterway ferry traffic in Sinclair Inlet contribute to the local noise environment.

As depicted in Figure 3.10-2, noise sensitive uses in the vicinity of NAVBASE Kitsap-Bangor include a daycare, two healthcare facilities, and a school/learning facility. Each of these noise sensitive locations are within the NAVBASE property where existing noise exposure is typical of vehicular traffic and aircraft overflights.

3.10.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Tables 3.10-3 and 3.10-4 summarize the potential effects to noise associated with RFFAs with a close causal relationship to the project at both NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.

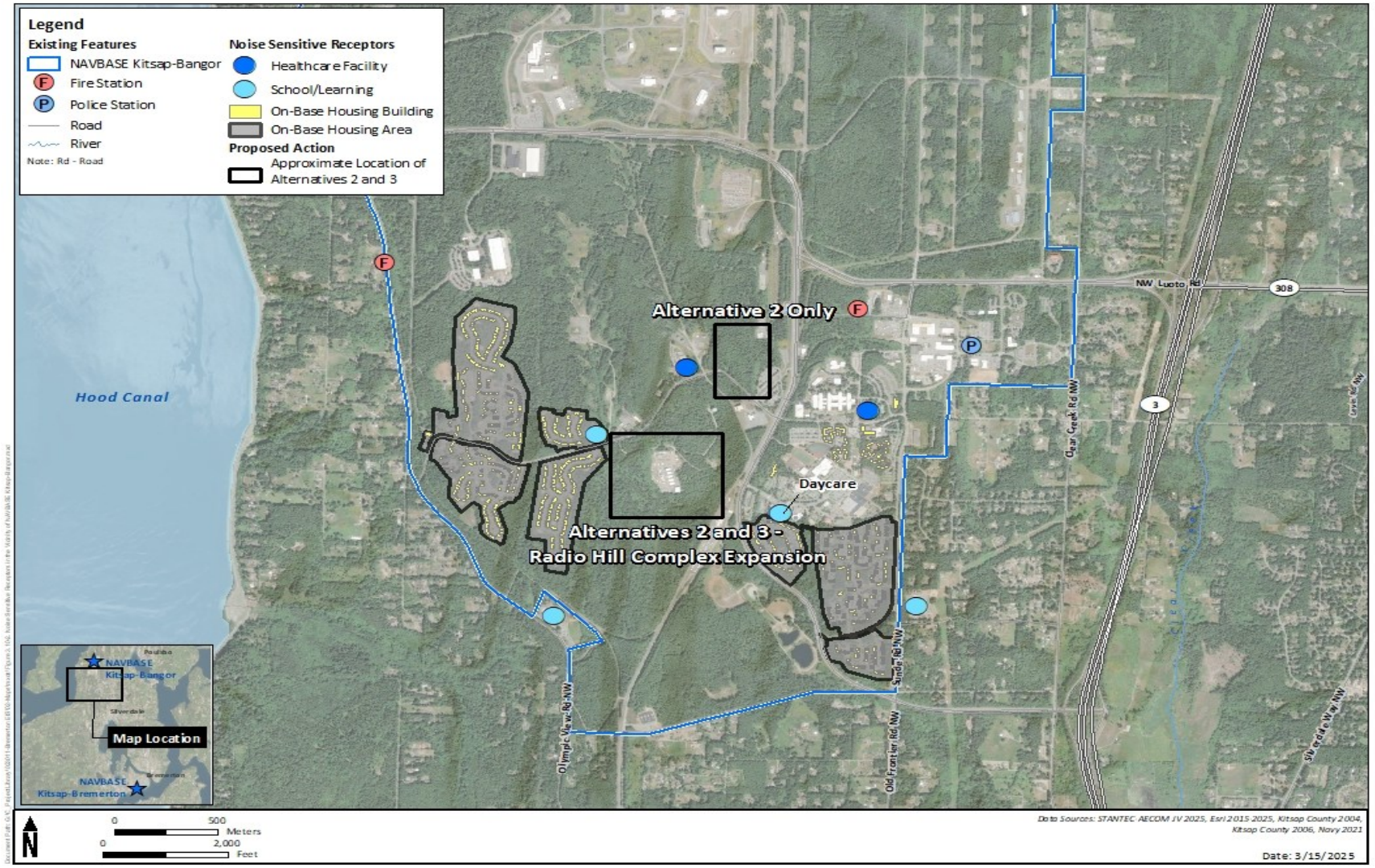

Figure 3.10-2 Noise Sensitive Receptors in the Vicinity of NAVBASE Kitsap-Bangor

Table 3.10-3 Effects to Noise from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy –Pier 3 Electrical Substation Repair, PSNS & IMF	The proposed construction is occurring within NAVBASE Kitsap-Bremerton.	The proposed electrical system modernization could create short-term increased noise levels in the vicinity to construction activity. However, no long-term or operational changes to the noise environment would occur once construction is completed.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF, and NAVBASE Kitsap-Manchester	The action comprises various levels of pile repair or replacement at Piers 4, 5, 6, 7 Mooring A and DD5 within NAVBASE Kitsap-Bremerton.	The action would require numerous piles driven over a 5-year period that could create substantial increases in noise levels during construction. However, no long-term or operational changes to the noise environment would occur.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	Construction of ASTs in NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	Minimal short-term noise would be generated by the Proposed Action related to construction. No long-term noise changes would occur during operations.
Navy – SIOP, PSNS & IMF	The action would include capital improvement projects at NAVBASE Kitsap-Bremerton.	All associated construction activity could create a short-term increase in noise, while long-term operational changes to the noise environment are anticipated to be minimal.
Navy – OU B Marine Source Removal Actions	The action would include in-water work at NAVBASE Kitsap-Bremerton.	All associated activity could create a short-term increase in noise related to construction, while no long-term operational changes to the noise environment are anticipated.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	No impact on noise within the ROI and no causal relations to the project at NAVBASE Kitsap Bremerton
Navy – NAVBASE Kitsap Bremerton Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	Would occur at NAVBASE Kitsap-Bremerton within the ROI	Not applicable. No reasonably close causal relationship to noise identified.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	The project includes street and street related improvements in the City of Bremerton.	No long-term operational changes to the noise environment would occur, and short-term increases in noise due to construction would be minimal.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Modify the Naval Ave corridor (1st Street to 11th Street) bike lanes, sidewalks, and other street improvements in the City of Bremerton.	No long-term operational changes to the noise environment would occur, and short-term increases due to construction noise would be minimal.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Marina Breakwater Replacement, Port Orchard Marina	The Port of Bremerton has proposed to replace the North Breakwater, East Breakwater, the approach floats and gangway at Port Orchard Marina in Sinclair Bay within several feet of the existing breakwaters.	The action would generate a temporary increase in noise levels during construction. However, no long-term or operational changes to the noise environment would occur.
Private Development – The Beacon and Beacon II	The Beacon and Beacon II are being constructed on the east side of Port Washington Narrows, which is approximately 1 mile from the NAVBASE Kitsap-Bremerton.	The action would create additional residential units that would become noise sensitive receptors. However, these residences would not be affected by the Proposed Actions due to distance.
Private Development – McWilliams Apartments	McWilliams Apartments is a multiphase apartment complex located 1 mile north of Kitsap Landing along the Highway 303 corridor in East Bremerton	The action would create additional residential units that would become noise sensitive receptors. However, the location would be approximately 3 miles from the NAVBASE Kitsap-Bremerton and would not be affected by the Proposed Actions.

Legend: AST = aboveground storage tank; DD = Dry Dock; NAVBASE = Naval Base; Navy = United States Department of the Navy; OU = Operable Unit; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; SIOP = Shipyard Infrastructure Optimization Program

Table 3.10-4 Effects to Noise from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy - Transit Protection Program Support Facilities	Hood Canal at NAVBASE Kitsap Bangor	The action would require construction resulting in short-term elevated noise. However, the noise impacts would not affect on- or off-base residential or school areas nor result in an increase in overall long-term noise levels at NAVBASE Kitsap Bangor.
Navy - Child Development Center	The Navy would replace the CDC and two MLCs with a larger CDC, which is a noise sensitive receptor.	The action would generate short-term noise during construction that may impact classroom learning. However, there would be no long-term change to noise levels in the area, and the replacement of the two MLCs may result in greater building sound attenuation that would decrease interior classroom noise levels; as a result, impacts to learning could decrease.
Navy - Military Working Dog Kennel Replacement	Site preparation would include site clearing, excavation and grading. Construction was scheduled to begin in 2022.	No long-term operational changes to the noise environment would occur, and short-term increases in noise due to construction would be minimal.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy - Repair Substation 5	The Navy would repair and construct electrical upgrades of substation and would replace existing switchgear.	No long-term operational changes to the noise environment would occur, and short-term increases in noise due to construction would be minimal.
Navy - Tang Road Repair	The Navy would replace the armoring, upgrade the road, and open the culvert to allow fish passage.	No long-term operational changes to the noise environment would occur, and short-term increases in noise due to construction would be minimal.
Navy - Equipment Processing Building	The Navy would clear approximately 2 acres along Archerfish Road to construct several buildings. Site preparation would include tree removal, site clearing, earthwork, grading, and preparation for construction.	The action would generate short-term noise during construction that may impact classroom learning. No long-term operational changes to the noise environment would occur.
Navy - Relocate Flier Road	Navy would relocate a 900-foot section of Flier Road.	No long-term operational changes to the noise environment would occur, and short-term increases in noise due to construction would be minimal.
Navy – CERCLA actions for PFAS	Within the ROI at various locations	No impact on noise in the ROI and no causal relationship to the project at Kitsap-Bangor
Navy – CERCLA Operable Unit 1 Site A	Within the ROI	No impact on noise in the ROI and no causal relationship to the project at Kitsap-Bangor
Navy – CERCLA Operable Unit 2 Site F	Within the ROI	No impact on noise in the ROI and no causal relationship to the project at Kitsap-Bangor
Navy – Alternate Power Transmission Line	The Navy would construct an alternate power transmission line from a power source at Clear Creek Road to a Bangor substation.	Although the construction work would generate temporary increases in noise in the vicinity of the project, the location is over 1 mile from the proposed projects at NAVBASE Kitsap-Bangor so it would not create any cumulative noise impacts to the proposed action.

Legend: CDC = Child Development Center; MLC = Mobile Learning Center; NAVBASE = Naval Base; Navy = U.S. Department of the Navy

3.10.3 Environmental Consequences

This section provides analysis of potential noise impacts and estimations of noise levels from the alternatives and determines potential effects to sensitive receptor sites. The effects analysis evaluated the potential for beneficial or adverse impacts in consideration of BMPs presented in Table 3.10-5 and 3.10-6 (also in Appendix A), which are measures that the Navy would implement to reduce the environmental impacts of designated activities, functions, or processes. There would be no applicable BMPs associated with either NAVBASE Kitsap-Bremerton or NAVBASE Kitsap-Bangor operations once construction was completed. Additional BMPs for noise impacts are relevant largely to marine biology and are addressed in Section 3.5 Biological Resources and Appendix N.

Table 3.10-5 Noise Best Management Practices at NAVBASE Kitsap-Bremerton - Construction

BMP	*Description*	*Applicability*
NOISE MGMT BREM-1	Because pile driving would pose the greatest risk of generating elevated noise levels at noise sensitive receptors, the window of activity would be limited to daylight hours, 6 days a week within the in-water work window. Dredging, would be conducted up to 24 hours per day, 6 days a week.	Construction - Reduction of impacts to people at noise sensitive areas on- and off-installation in the vicinity of NAVBASE Kitsap-Bremerton.
NOISE MGMT BREM-2	Construction noise would be reduced by ensuring correctly functioning muffler systems are installed on equipment utilizing internal combustion engines.	Construction - Reduction in noise levels to noise sensitive areas in the vicinity of construction equipment.
NOISE MGMT BREM-3	All stationary noise-generating construction equipment, such as air compressors and portable power generators, would be located as far as practical from existing noise sensitive land uses.	Construction - Reduction in noise levels to noise sensitive areas in the vicinity of construction equipment.

Note: A detailed description of the BMPs can be found in Appendix A.
Legend: BMP = Best Management Practice; NAVBASE= Naval Base; MGMT = Management

Table 3.10-6 Noise Best Management Practices at NAVBASE Kitsap-Bangor - Construction

BMP	*Description*	*Applicability*
NOISE MGMT BANG-1	Construction noise would be reduced by ensuring correctly functioning muffler systems are installed on equipment utilizing internal combustion engines.	Reduction to noise sensitive areas in the vicinity of construction equipment.
NOISE MGMT BANG-2	All stationary noise-generating construction equipment, such as air compressors and portable power generators, would be located as far as practical from existing noise sensitive land uses.	Reduction in noise levels to noise sensitive areas in the vicinity of construction equipment.

Note: A detailed description of the BMPs can be found in Appendix A.
Legend: BMP = Best Management Practice; NAVBASE= Naval Base; MGMT = Management

3.10.3.1 Nature and Type of Effects

An extensive amount of research has been conducted regarding noise effects on humans, including annoyance, speech interference, classroom/learning interference, sleep disturbance, effects on recreation, potential hearing loss, and nonauditory health effects, as summarized in Appendix N. Table 3.10-7 summarizes the estimated L_{eq} and L_{max} noise levels estimated for pile driving associated with Alternative 2. Noise in relation to marine and terrestrial biological resources is discussed in Section 3.5 Biological Resources.

Many project components may generate noise and warrant analysis as contributors to the total noise impact. Both airborne and underwater noise created by in-water construction work, landside construction work, construction material and workforce transport, and maintenance dredging could potentially result in increased noise levels to both environments. Detailed information on noise modeling is provided in Appendix N. Underwater impacts are addressed in Section 3.5 Biological Resources.

3.10.3.2 Impact Assessment Methodology

Impact assessment methodology compares calculated noise levels anticipated to occur due to the action alternatives to the existing noise environment. The Federal Highway Administration Roadway Construction Noise Model RCNM (Version 2) was used to determine noise levels at noise sensitive receptors due to proposed construction equipment (Federal Highway Administration 2006a). The loudest type of equipment has been modeled at the nearest point of operation to noise sensitive receptors for impact analysis to provide a "worst-case" scenario.

Even though existing noise levels at identified noise sensitive receptors are not currently available, those conditions can be estimated for the purposes of impact analysis based upon the characteristics of the local area, which generally comprises residential or urban environments. As detailed in the Kitsap County Code, residential areas can be exposed to noise of up to 60 dB originating from industrial zones during the daytime (7 a.m. to 10 p.m.) and at greater noise levels due to various exempted sources (temporary construction, existing commercial operations, Washington Administrative Code regulated motor vehicles, aircraft flights, etc.). Many of the noise sensitive locations are in urban settings that currently experience many of the exempted noise-generating activities. Existing noise levels at these receptors are likely within the range of 60 to 65 dB during the daytime. A recent test pile study measured both short-term and long-term noise levels at various locations within NAVBASE Kitsap-Bremerton. Several measurement sites were near the Navy property boundary across the street from several noise sensitive locations analyzed in this EIS, such as 606 Burwell Apartments (R06) and Lutheran Community Services NW (W06). For reference, the test pile measurements reflected ambient L_{eq} ranging from 55 to 68 dB in these areas (Navy 2024). Although DNL represents an average day construction noise, sources are generally more appropriately assessed with equivalent sound level (L_{eq}) (over 1 hour, 8 hour, or 24-hour periods) and/or L_{max} (Federal Highway Administration 2006b). The analysis focuses on the potential for increases in noise above 65 dB L_{eq}. Construction equipment usage would vary as needed; therefore, L_{eq} is reported for 1-hour periods, which may occur at any time during daylight hours each day.

The primary types of impacts associated with noise that could result from implementation of the Proposed Action include elevated noise levels at noise sensitive locations, which are assumed to experience noise levels compatible with local, county, and state regulations. These results are discussed in detail in Sections 3.10.3.3 through 3.10.3.6

3.10.3.3 Impact Analysis for Alternative 1: No-Action

Under Alternative 1, the Proposed Action would not occur. However, the Navy would continue to maintain, repair, and operate existing facilities. Effects associated with RFFAs could cause temporary increases in ambient noise at nearby noise sensitive areas due to temporary construction but there would be no long-term changes to the noise environment.

3.10.3.4 Impact Analysis for Alternative 2 (Preferred Alternative)

Construction-related Impacts

Noise would be created during demolition and construction of new facilities, from in-water work such as pile driving and dredging, and from marine traffic required for transportation of materials, equipment, and construction workers.

NAVBASE Kitsap-Bremerton

The demolition and rebuilding of the Storage Facility, located along the northern side of NAVBASE Kitsap-Bremerton, would generate elevated noise levels in the nearby City of Bremerton. The noise sensitive locations in this area include two places of worship (W05-Church of Christ Scientist and W06-Lutheran Community Services Northwest), a healthcare facility (H02-Peninsula Community Health Services Administration) and a residential apartment building (R10-606 Burwell Apartments). These noise sensitive locations would experience elevated noise levels that would range from 55 to 70 dB L_{max}.

The locations in the vicinity of NAVBASE Kitsap-Bremerton most likely to notice the additional noise from dredging would be R01 along the City of Bremerton's eastern shoreline, R08 and R09 residential areas in the northern part of Port Orchard, and R05, R06, and R07 in Navy Yard City adjacent Navy Base Kitsap, due to their proximity.

In addition to the above described dredging and non-pile driving construction, pile driving at NAVBASE Kitsap-Bremerton required for in-water construction would represent the greatest source of noise. The pile driving would generate repetitive impact noise during pile installation, lasting up to 6 days per week during the in-water work window each year, occurring intermittently, and occurring in each year of the construction schedule. Table 3.10-7 provides the resulting L_{eq} and L_{max} noise levels estimated for each noise sensitive location due to the nearest project component. Thirteen locations would experience L_{eq} 70 dB or greater during pile driving with an estimated increase of 5 to 20 dB from the estimated existing conditions. In general, a 5 dB increase would be noticeable, a 10 dB increase is typically considered a dramatic increase, and 20 dB increase striking fourfold increase. The greatest noise levels of up to 84 dB L_{eq} and 92 dB L_{max} would occur at the Burwell Apartments (R10) and Lutheran Community Services Northwest (W06) due to pile driving for the M2D2 at the current DD3 location. As depicted in Appendix N, typical A-weighted sound levels within this range equates to noise heard on a sidewalk generated by a passing automobile or a jetliner aircraft overflight. Other nearby noise sensitive locations that would also experience elevated L_{eq} above 70 dB due to M2D2 pile driving would be Peninsula Community Health Services Administration (H02), Residences at Washington Beach Avenue and Burwell Street (R01), Residences at 606 Burwell Apartments (R10), Our Lady Star of the Sea Catholic School (S02), Embassy Educational Center (S03), Our Lady Star of the Sea Catholic Church (W04), Church of Christ Scientist (W05), Emmanuel Apostolic Church (W07), The Salvation Army (W08), and Emanuel Apostolic Church (W09). The residential areas near State Street and Mahan Avenue (R02) and near South Lafayette Avenue and Preble Street (R11), and the Bremerton Child Development Center on installation would experience L_{eq} of up to 76 dB and L_{max} up to 84 dB due to Pier 4 and Pier 2 pile driving. Although some locations are estimated to experience a maximum L_{eq} of 80 dB or greater at some point during the construction period (the threshold for potential for hearing loss consideration), Section 4 in Appendix N provides a discussion of this conservative criteria and why people would be unlikely to be at risk due to the proposed pile driving (e.g. people would be inside at least some of the time where interior noise levels are 15 to 25 dB less).

The Navy's 2024 test pile study included noise and vibration monitoring of background and pile-driving activity. Recorded noise levels confirmed the modeled L_{eq} and L_{max} noise levels estimated in the DEIS.

All construction noise under Alternative 2 would be intermittent and would not occur at the same level during the entire construction timeline. However, due to the 15-year construction schedule containing multiple periods of intense construction activity, people that would be exposed to noise may not perceive the project as short-term. Pile driving noise levels would be substantially greater than the

existing noise at some noise sensitive locations, occurring intermittently each year of the construction schedule. Construction, including pile driving, would be limited to daylight hours, which reduces the impacts to surrounding noise sensitive areas (as listed in Table 3.10-5).

Table 3.10-7 Estimated Exterior Noise Levels Due to Proposed Pile Driving Associated with Alternative 2

ID	*Type*	*Name*	*Nearest Pile Driving Noise Source*	*Distance feet/path (land or water)*	*L_{eq} (1 hour) (dB)[1]*	*L_{max} (dB)[1]*
H01	Healthcare Facility	Forest Ridge Health & Rehab	Pier 2	> 1 mile	N/A	N/A
H02	Healthcare Facility	Peninsula Community Health Services Administration	M2D2 at DD3	1,100 / land	77	86
R01	Residential Area	Washington Beach Avenue and Burwell Street	M2D2 at DD3	1,200 / land	75	84
R02	Residential Area	State Street and Mahan Avenue	Pier 4	1,500 / land	76	84
R03	Residential Area	Naval Avenue and Mahan Avenue	Pier 2	2,500 / land	68	74
R04	Residential Area	South Cambrian Avenue and Coontz Street	Pier 2	4,300 / land	63	68
R05	Residential Area	South Lafayette Avenue and Preble Street	Pier 2	4,400 / water	64	71
R06	Residential Area	South Summit Avenue and South Charleston Avenue	Pier 2	> 1 mile	N/A	N/A
R07	Residential Area	West Charlotte Avenue and McCall Boulevard West	Pier 2	> 1 mile	N/A	N/A
R08	Residential Area	Lawrence Street and Perry Avenue	M2D2 at DD3	4,000 / water	62	72
R09	Residential Area	Prospect Street and Frederick Avenue	Pier 2	5,100 / water	61	70
R10	Residential Area	606 Burwell Apartments	M2D2 at DD3	900 / land	84	92
R11	Residential Area	Installation housing area (multiple locations)	Pier 2	1,000 / land	73	80
S01	School/Learning	Little Sprouts Preschool	Pier 2	> 1 mile	N/A	N/A
S02	School/Learning	Our Lady Star of the Sea Catholic School	M2D2 at DD3	2,500 / land	70	76
S03	School/Learning	Embassy Educational Center	M2D2 at DD3	1,600 / land	73	81
S04	School/Learning	Sycamore Tree School	M2D2 at DD3	3,000 / land	65	72
S05	School/Learning	West Hills STEM Academy School	Pier 2	> 1 mile	N/A	N/A
S06	School/Learning	Renaissance and Marion Schools	Pier 2	> 1 mile	N/A	N/A
S07	School/Learning	Naval Avenue Elementary School	Pier 2	4,500 / land	63	68
S08	School/Learning	Bremerton Child Development Center (on-installation)	Pier 2	2,700 / land	68	75

ID	*Type*	*Name*	*Nearest Pile Driving Noise Source*	*Distance feet/path (land or water)*	*L_{eq} (1 hour) (dB)[1]*	*L_{max} (dB)[1]*
W01	Place of Worship	Faith Community Bible Church	Pier 2	> 1 mile	N/A	N/A
W02	Place of Worship	Summit Avenue Presbyterian Church	Pier 2	4,500 / land	62	70
W03	Place of Worship	First Christian, Apostolic Life Tabernacle, and Community of Christ	M2D2 at DD3	3,000 / land	67	73
W04	Place of Worship	Our Lady Star of the Sea Catholic Church	M2D2 at DD3	2,000 / land	70	77
W05	Place of Worship	Church of Christ Scientist	M2D2 at DD3	1,000 / land	78	87
W06	Place of Worship	Lutheran Community Services Northwest	M2D2 at DD3	900 / land	81	89
W07	Place of Worship	Emmanuel Apostolic Church	M2D2 at DD3	1,700 / land	73	81
W08	Place of Worship	The Salvation Army	M2D2 at DD3	1,500 / land	72	80
W09	Place of Worship	Emanuel Apostolic Church	M2D2 at DD3	2,000 / land	71	78
W10	Place of Worship	Ebenezer AME Church	M2D2 at DD3	2,500 / land	68	75

Note: 1) Building attenuation with windows open typically reduces the interior sound levels to 15 dB less than exterior levels for external noise sources and with windows closed reduces by 25 dB (DoD 2009)

Legend: db = decibel; DD = dry dock; ID = Identification; L_{eq} = equivalent sound level; L_{max} = maximum sound level; M2D2 = multi-mission dry dock; N/A = not appliable due to distance over 1 mile; STEM = Science, Technology, Engineering, and Mathematics

NAVBASE Kitsap-Bangor

The nearest noise sensitive receptors at NAVBASE Kitsap-Bangor are base housing and the Admiral Boorda Teen Center, located over 800 feet from the proposed Radio Hill complex expansion site, and over 2,500 feet from the proposed forge shop site, as depicted in Figure 3.10-3. An outpatient healthcare facility and medical education facility is located approximately 1,000 feet from the proposed forge shop location, although this facility is not considered noise-sensitive (Figure 3.10-4). Noise levels at these noise sensitive areas due to non-pile driving construction equipment at the proposed Radio Hill complex expansion site would range from 50 to 65 dB L_{max}, which would be similar in L_{max} to a passing road vehicle. With no nearby noise sensitive locations, construction of the forge shop and expansion of Radio Hill complex would not generate noise that would adversely affect noise sensitive human receptors.

Although nearby sensitive receptors may be subject to increased noise, expansion of the Radio Hill complex would occur during daylight hours, which is exempt from state and Kitsap County noise regulations.

Figure 3.10-3 Proposed Construction Area at NAVBASE Kitsap-Bangor Common to Both Action Alternatives

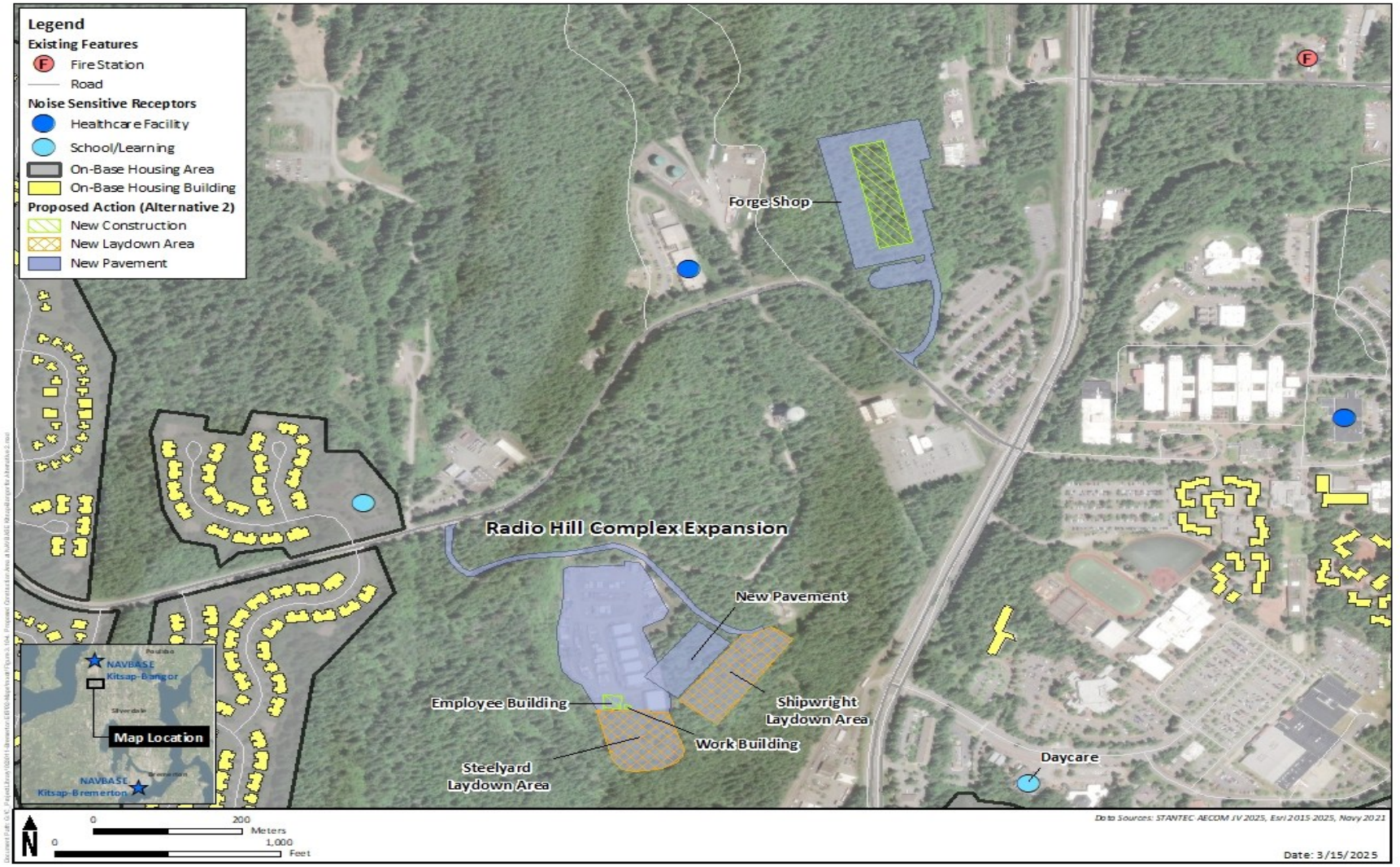

Figure 3.10-4 Proposed Construction Area at NAVBASE Kitsap-Bangor for Alternative 2

Summary

Upland work would comprise clearing and grading, construction materials laydown, and staging, all requiring construction equipment operation, such as forklifts, bulldozers, and dump trucks. Noise sensitive locations at both NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor are a minimum of 800 feet from proposed upland work; thus, none would experience elevated noise levels, and none would be affected by non-pile driving construction, clearing, grading, and in-water dredging. Pile driving that would occur at NAVBASE Kitsap-Bremerton under Alternative 2 would represent the source of greatest temporary increase in noise associated with construction-related activities and the greatest potential for noise impacts to noise sensitive areas. Residents and school children near the proposed construction site would experience periods of increased annoyance due to elevated noise levels, which could interfere with classroom learning if windows are left open during those times. While indoors, both nearby residents and school children would be able to mitigate those noise levels if windows are closed, which would reduce interior noise by approximately 25 dB from the exterior levels presented in Table 3.10-7 (DoD 2009). Due to the 14- to 15-year construction schedule containing multiple periods of intense construction activity, people that would be exposed to noise, even less than significant levels, may not perceive the project as short-term or temporary and may be adversely affected by noise.

Operation-related Impacts

At NAVBASE Kitsap-Bremerton, the relocation of the aircraft carrier maintenance from DD6 to the east end of the shipyard would result in a change in noise levels that could be more noticeable to off-site receptors when an aircraft carrier is in M2D2. At NAVBASE Kitsap-Bangor, operation of the new forge shop would add a new source of noise at NAVBASE Kitsap-Bangor. Current UFCs (UFC 3-101-01 [Architecture] and UFC 3-450.01 [Noise and Vibration Control] require noise control and sound isolation for mechanical rooms adjacent to occupied spaces. The Navy would design the new forge shop to not exceed approximately 60 dB on the exterior of the facility.

Effects Associated with Reasonably Foreseeable Future Actions

As described in Tables 3.10-3 and 3.10-4, RFFAs would generate additional noise associated with their construction but would be temporary and at levels less than associated with this project's pile driving.

3.10.3.5 Impact Analysis for Alternative 3

Construction-related Impacts

Noise would be created during demolition and construction of new facilities, from in-water work such as pile driving and dredging, and from marine traffic required for transportation of materials, equipment, and construction workers. The primary difference between the two action alternatives would be the locations of construction and the resulting pile driving activity at NAVBASE Kitsap-Bremerton. Under Alternative 3 the proposed location of M2D2 would be at Mooring A, approximately one-half mile southwest from the Alternative 2 site, which would be farther from the installation boundary and noise sensitive locations.

NAVBASE Kitsap-Bremerton

The demolition and rebuilding of the Storage Facility, located along the northern side of NAVBASE Kitsap-Bremerton, and dredging would create noise that would be the same as under Alternative 2 for non-pile driving construction.

The pile driving noise due to Alternative 3 would result in three fewer noise sensitive locations that would experience L_{eq} of 70 dB or greater than under Alternative 2. Table 3.10-8 provides the estimated L_{eq} and L_{max} noise levels for each noise sensitive location due to the nearest project component. As with Alternative 2, the analysis assumes impact pile driving to occur during the daylight hours and within the DNL daytime period (7 a.m. to 10 p.m.).

The greatest noise levels would occur in the residential area near State Street and Mahan Avenue (R02) that would experience L_{eq} of 76 dB with an L_{max} up to 83 dB, while the residential area at 606 Burwell Apartments (R10) and Church of Christ Scientist (W05) would experience L_{eq} of 73 dB with an L_{max} up to 80 dB. The residential area of on-installation housing within NAVBASE Kitsap-Bremerton (R11) would experience the same L_{eq} of 73 dB with an L_{max} up to 79 dB. This would represent an increase of up to 11 dB from existing conditions that would be experienced as a dramatic increase roughly twice as loud. In general, these increases would be in the range that would be quite noticeable. No noise sensitive locations would experience L_{eq} of 80 dB or greater during the construction period so there would be risk of potential for hearing loss. Section 4 in Appendix N provides a discussion of the applicable criteria.

Five additional noise sensitive locations would experience L_{eq} between 70 and 72 dB under Alternative 3 (Peninsula Community Health Services Administration (H02), Embassy Educational Center (S03), Bremerton Child Development Center (S08), Lutheran Community Services Northwest (W06), Emmanuel Apostolic Church (W07)). All construction noise from Alternative 3 would be temporary and would not affect the long-term noise environment. However, due to the 15-year construction schedule containing multiple periods of intense construction activity, people that would be exposed to noise may not perceive the project as temporary. Pile driving noise levels would be substantially greater than the existing noise at some noise sensitive locations, lasting weeks to months. Noise generated under Alternative 3 would be similar to that of Alternative 2 but would impact fewer noise sensitive locations. Construction would be limited to between 7 a.m. and 9 p.m., consistent with the more restrictive construction window identified in the City of Port Orchard municipal code, to reduce impacts to surrounding noise sensitive areas (NOISE MGMT BREM-1 as listed in Table 3.10-5).

Table 3.10-8 Estimated Exterior Noise Levels Due to Proposed Pile Driving Associated with Alternative 3

ID	*Type*	*Name*	*Nearest Pile Driving Noise Source*	*Distance feet/path (land or water)*	*L_{eq} (8 hour) (dB)[1]*	*L_{max} (dB)[1]*
H01	Healthcare Facility	Forest Ridge Health & Rehab	M2D2 and Wharf 2	> 1 mile	N/A	N/A
H02	Healthcare Facility	Peninsula Community Health Services Administration	Pier 4	2,000 / land	72	79
R01	Residential Area	Washington Beach Avenue and Burwell Street	Pier 4	3,000 / land and water	68	75
R02	Residential Area	State Street and Mahan Avenue	Pier 4	1,500 / land and water	76	83
R03	Residential Area	Naval Avenue and Mahan Avenue	M2D2 and Wharf 2	2,000 / land	69	75
R04	Residential Area	South Cambrian Avenue and Coontz Street	M2D2 and Wharf 2	3,500 / land	64	70

ID	*Type*	*Name*	*Nearest Pile Driving Noise Source*	*Distance feet/path (land or water)*	*L_{eq} (8 hour) (dB)[1]*	*L_{max} (dB)[1]*
R05	Residential Area	South Lafayette Avenue and Preble Street	M2D2 and Wharf 2	3,600 / water	66	73
R06	Residential Area	South Summit Avenue and South Charleston Avenue	M2D2 and Wharf 2	4,600 / water	63	69
R07	Residential Area	West Charlotte Avenue and McCall Boulevard West	M2D2 and Wharf 2	> 1 mile	N/A	N/A
R08	Residential Area	Lawrence Street and Perry Avenue	Pier 4	4,500 / water	63	70
R09	Residential Area	Prospect Street and Frederick Avenue	M2D2 and Wharf 2	4,000 / water	62	71
R10	Residential Area	606 Burwell Apartments	Pier 4	2,000 / land	73	80
R11	Residential Area	On-installation housing area (multiple locations)	M2D2 and Wharf 2	1,700 / land	73	80
S01	School/Learning	Little Sprouts Preschool	M2D2 and Wharf 2	5,100 / land and water	61	67
S02	School/Learning	Our Lady Star of the Sea Catholic School	Pier 4	2,500 / land	63	68
S03	School/Learning	Embassy Educational Center	Pier 4	2,500 / land	70	77
S04	School/Learning	Sycamore Tree School	Pier 4	4,000 / land	64	70
S05	School/Learning	West Hills STEM Academy School	M2D2 and Wharf 2	> 1 mile	N/A	N/A
S06	School/Learning	Renaissance and Marion Schools	M2D2 and Wharf 2	> 1 mile	N/A	N/A
S07	School/Learning	Naval Avenue Elementary School	M2D2 and Wharf 2	4,500 / land	63	68
S08	School/Learning	Bremerton Child Development Center (on-installation)	M2D2 and Wharf 2	2,200 / land	72	79
W01	Place of Worship	Faith Community Bible Church	M2D2 and Wharf 2	> 1 mile	N/A	N/A
W02	Place of Worship	Summit Avenue Presbyterian Church	M2D2 and Wharf 2	3,900 / land	65	71
W03	Place of Worship	First Christian, Apostolic Life Tabernacle, and Community of Christ	Pier 4	3,500 / land	66	71
W04	Place of Worship	Our Lady Star of the Sea Catholic Church	Pier 4	2,500 / land	69	76
W05	Place of Worship	Church of Christ Scientist	Pier 4	2,000 / land	73	80
W06	Place of Worship	Lutheran Community Services Northwest	Pier 4	2,000 / land	72	79

ID	*Type*	*Name*	*Nearest Pile Driving Noise Source*	*Distance feet/path (land or water)*	*L_{eq} (8 hour) (dB)[1]*	*L_{max} (dB)[1]*
W07	Place of Worship	Emmanuel Apostolic Church	Pier 4	2,500 / land	70	77
W08	Place of Worship	The Salvation Army	Pier 4	2,500 / land	69	76
W09	Place of Worship	Emanuel Apostolic Church	Pier 4	3,000 / land	67	74
W10	Place of Worship	Ebenezer AME Church	Pier 4	3,500 / land	65	72

Note: 1) Building attenuation with windows open typically reduces the interior sound levels to 15 dB less than exterior levels for external noise sources and with windows closed reduces by 25 dB (DoD 2009)

Legend: db = decibel; ID = Identification; L_{eq} = equivalent sound level; L_{max} = maximum sound level; M2D2 = multi-mission dry dock; N/A = not appliable due to distance over 1 mile; STEM = Science, technology, engineering, and mathematics

NAVBASE Kitsap-Bangor

Although nearby sensitive receptors may be subject to increased noise, expansion of the Radio Hill complex would occur during daylight hours, which is exempt from state and Kitsap County noise regulations.

Under Alternative 3, Construction-related noise impacts at NAVBASE Kitsap-Bangor would be less than described in Alternative 2 because Alternative 3 does not include construction of the forge shop.

Summary

Overall, pile driving that would occur at NAVBASE Kitsap-Bremerton under Alternative 3 would represent the source of greatest temporary increase in noise associated with construction-related activities and the greatest potential for noise impacts to noise sensitive areas. Residents near the proposed construction site would experience periods of increased annoyance due to elevated noise levels. While indoors, nearby residents would be able to mitigate those noise levels if windows are closed, which would reduce interior noise by approximately 25 dB from the exterior levels presented in Table 3.10-8 (DoD 2009). Due to the greater distance between the nearest schools and the proposed pile driving locations under Alternative 3, when compared with Alternative 2, the greatest school L_{eq} under Alternative 3 would be an average of approximately 2 dB less than under Alternative 2. Table 3.10-8 also presents single-event noise levels where L_{max} would reach 79 dB at on-base Bremerton Child Development Center (S08), which would exceed the recommended 65 dB single-event levels for classroom learning . Changes in noise less than 3 dB are considered barely perceptible for most people. Estimated pile driving noise levels reflect the 'worst-case' conditions because levels are calculated when pile driving would occur at the locations closest to each noise sensitive area. The model does not account for sound attenuation of buildings that would obstruct the path of sound to some receptors. Windows are assumed open at classroom and residential locations so the threshold for impacts is lower. Although it is possible that single-event noise levels at Our Lady Star of the Sea Catholic School (S02) and Embassy Educational Center (S03) would exceed the interior recommended levels under the worst conditions, impacts could be fully mitigated to within established interior L_{eq} and L_{max} levels if classroom windows are kept closed during all pile driving activity under Alternative 3.

Operation-related Impacts

NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor

Since M2D2 would be located near DD6 where existing carrier maintenance currently occurs, operation of Alternative 3 would result in no significant change in noise impacts to off-site receptors.

Effects Associated with Reasonably Foreseeable Future Actions

As described in Tables 3.10-3 and 3.10-4, RFFAs would generate additional noise associated with their construction but would be temporary and at levels less than associated with this project's pile driving.

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3.11 Utilities

This section discusses utilities (drinking/potable water production, storage, and distribution; wastewater collection treatment and disposal; solid waste management; energy/electricity production, transmission, and distribution; and communication infrastructure). Infrastructure associated with stormwater, transportation systems and traffic, marine navigation (maritime traffic), and hazardous materials and waste are addressed separately in Sections 3.3, 3.12, 3.13, and 3.15, respectively.

3.11.1 Regulatory Setting

Table 3.11-1 provides a description of the existing regulatory environment for utilities at NAVBASE Kitsap-Bremerton, Washington. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.11-1 Regulatory Setting for Utilities

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
Dockside Utilities for Ship Service	UFC 4-150-02, November 12, 2020
Design: Piers and Wharves, with Change 1	UFC 4-152-01, August 28, 2024
Design: Graving Dry Docks	UFC 4-213-10, May 18, 2020
Information and Communications Technology Infrastructure Planning and Design	UFC 3-580-01, November 21, 2024

Law, Regulation, or Guidance	*Regulatory Citation*
Clean Water Act	CFR Title 33 U.S.C. Sections 1313, 1314, 303(d), 305(b) and most recent 304(a) list
Rivers and Harbors Act	40 CFR 116.4, Sections 307, 311, 401, 404
EPA Solid Wastes Guidance	CFR, Title 40, section 240-258
National Pollutant Discharge Elimination System	CFR Title 40
Local	
Utilities Infrastructure Management Manual	NAVFAC P-603, October 2018
Public Works Utilities Criteria for Design & Construction of Electric, Sewer, & Water	NAVFAC Marianas PWUC, November 15, 2018

Legend: CFR = Code of Federal Regulations; EPA = Environmental Protection Agency; NAVFAC = Naval Facilities Engineering Systems Command; PWUC = Public Works Utilities Criteria; UFC = Unified Facilities Criteria; U.S.C. = United States Code
Sources: DoD 2017, 2020a, 2020b, 2024; Navy 2018b, 2018c

3.11.2 Affected Environment

The ROI for utilities is the NAVBASE Kitsap-Bremerton shipyard boundary and utility connections within the shipyard vicinity. The ROI at NAVBASE Kitsap-Bangor is limited to areas surrounding the proposed forge shop site and Radio Hill complex expansion area. The following discussions provide a description of the existing conditions for each of the categories under utilities at PSNS & IMF.

3.11.2.1 Existing Conditions

NAVBASE Kitsap-Bremerton

There are multiple utilities located within the project area, including potable water, saltwater, wastewater, process water, solid waste management, electrical power, and information technology/communications. Existing conditions for these utilities are listed in Table 3.11-2. Other utilities such as chilled water, nitrogen, and compressed air systems are not addressed because they are only indirectly associated with public utility issues and other effects from more primary utility systems.

Table 3.11-2 Existing Conditions for Utilities at NAVBASE Kitsap-Bremerton

Utility	*Existing Condition*
Potable Water	The potable water distribution system main line feeds smaller mains that provide potable water and fire protection to the existing dry docks and adjacent buildings.
Saltwater	The saltwater system for existing dry docks supplies fire suppression water and supplemental cooling to the existing dry docks. The current saltwater system serves DD1, DD2, DD3, DD4, and DD5 and Piers 3, 5, 6, and 7.
Wastewater	Discharges from the dry dock and the vessels being serviced are variable and diverse. Sanitary sewer flows consist of ship collection, holding, and transfer discharge; oily waste treatment system plant discharge; and process water collection system discharge. Sanitary sewer/wastewater service is currently provided through a series of force mains throughout the installation, supported by lift stations.

Utility	*Existing Condition*
Process Water	Process water is water captured from the floor of the dry docks, including stormwater and miscellaneous wastewaters associated with vessel operations and maintenance. Process water may be released to the sanitary sewer directly, treated and then released to the sanitary sewer, or discharged to Sinclair Inlet if the flow limit for discharge to the sanitary sewer has been met and the tanks have no more storage capacity. Saltwater from the process water collection has entered the wastewater system under certain conditions, which is a concern due to the corrosive nature of saltwater and the method of treatment that is required. Saltwater can enter the process water collection system from various sources, including direct discharge from ships, groundwater leakage from the dry dock groundwater relief system, and cracks in the dry dock walls and floor.
Solid Waste Management	Solid waste service is provided through contract operations for the installation and waste is transported to local facilities for proper disposal as part of the contract.
Electrical Power	Electrical medium voltage power is currently provided to existing dry docks, piers and supporting facilities by underground primary distribution feeders that originate from primary substations within the site. Standby diesel generator power is provided via a central plant. Load shedding is done manually. There is also backup diesel power for the vessels.
Information Technology/Communications	The existing telecommunication systems consist of shipyard subsurface pathway infrastructure (manholes/duct banks), fiber optic and copper cabling, Supervisory Control and Data Acquisition system infrastructure and Industrial Control System infrastructure, cable television, Giant Voice Mass Notification Systems, advanced metering infrastructure, information networks such as Shipyard Local Area Network and Navy Marine Corps Intranet, ship to shore telecommunications that connect to the submarines/vessels, telephone, dock control system, electronic security, fire alarm, and wireless systems such as cellular, Wi-Fi (dry docks), and ELMRS.

Legend: DD = dry dock; ELMRS = Enterprise Land Mobile Radio System; M2D2 = multi-mission dry dock

NAVBASE Kitsap-Bangor

NAVBASE Kitsap-Bangor is an active military installation located on the eastern shoreline of Hood Canal. The site is partially developed with office buildings, residences, industrial facilities, and other structures used to support military operations. Utilities including potable water, electrical power, and information technology/communications are provided to developed sites to meet individual facility needs. Utility conditions described in Table 3.11-2 for NAVBASE Kitsap-Bremerton are similar to the conditions present at the NAVBASE Kitsap-Bangor Radio Hill complex expansion with the exception of saltwater and process water systems.

3.11.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Table 3.11-3 summarizes the effects to utilities associated with RFFAs with a close causal relationship to the project at NAVBASE Kitsap-Bremerton. The RFFAs for NAVBASE Kitsap-Bangor are summarized in Table 3.11-4.

Table 3.11-3 Effects to Utilities from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Pier 3 Electrical Substation Repair, PSNS & IMF	Areas overlap/contain portions of the proposed project.	This project would directly affect the electrical utilities system at PSNS & IMF and could potentially affect other utilities during the modernization program.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF, and NAVBASE Kitsap-Manchester	Areas overlap/contain portions of the proposed project.	The pile replacement could require rerouting of current and planned utilities at Piers 4, 5, 6, and 7; Mooring A; and DD5.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	Not applicable. Located at NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	No reasonably close causal relationship to utilities identified.
Navy –SIOP, PSNS & IMF	Areas overlap/contain portions of the proposed project.	The project could lead to changes to the current and planned utilities systems at PSNS & IMF.
Navy – Operable Unit B Marine Source Removal Actions	Not applicable.	No reasonably close causal relationship to utilities identified.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	No reasonably close causal relationship to utilities identified.
Navy – NAVBASE Kitsap Bremerton Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	Located within or adjacent to the NAVBASE Kitsap-Bremerton Proposed Action area.	No reasonably close causal relationship to utilities identified.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	Not applicable.	No reasonably close causal relationship to utilities identified.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Not applicable.	No reasonably close causal relationship to utilities identified.
Port of Bremerton – Marina Breakwater Replacement, Port Orchard Marina	Not applicable.	No reasonably close causal relationship to utilities identified.
Private Development – The Beacon and Beacon II	Not applicable.	No reasonably close causal relationship to utilities identified.
Private Development – McWilliams Apartments	Not applicable.	No reasonably close causal relationship to utilities identified.

Legend: DD = Dry Dock; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility

Sources: Navy 2018a, 2018d, 2019a, 2019b, 2021a

Table 3.11-4 Effects to Utilities from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Transit Protection Program Support Facilities	Located outside of NAVBASE Kitsap-Bangor Radio Hill complex expansion Proposed Action area.	No reasonably close causal relationship to utilities identified.
Navy – Child Development Center	The demolition and construction project would be located approximately 2,200 feet southeast of the NAVBASE Kitsap-Bangor Radio Hill complex expansion Proposed Action area.	Construction activities could interfere with construction of the proposed project.
Navy – Military Working Dog Kennel Replacement	The demolition and construction project would be located approximately 1,300 feet north and east of the NAVBASE Kitsap-Bangor Radio Hill complex expansion Proposed Action area.	No reasonably close causal relationship to utilities identified.
Navy – Repair Substation 5	Located outside of NAVBASE Kitsap-Bangor Radio Hill complex expansion Proposed Action area.	The project would impact electrical utilities, though this RFFA is located 3 miles north of the NAVBASE Kitsap-Bangor Proposed Action area.
Navy – Tang Road Repair	Located approximately 4.5 miles north of NAVBASE Kitsap-Bangor Proposed Action areas.	No reasonably close causal relationship to utilities identified.
Navy – Equipment Processing Building	Located approximately 4 miles north of NAVBASE Kitsap-Bangor Proposed Action Areas.	No reasonably close causal relationship to utilities identified.
Navy – Flier Road Relocation	Located approximately 5 miles north of NAVBASE Kitsap-Bangor Proposed Action Areas.	No reasonably close causal relationship to utilities identified.
Navy – CERCLA actions for PFAS	Various sites across the base located within or adjacent to NAVBASE Kitsap-Bangor Proposed Action areas.	No reasonably close causal relationship to utilities identified.
Navy – CERCLA Operable Unit 1 Site A	Located within or adjacent to NAVBASE Kitsap-Bangor Proposed Action areas.	No reasonably close causal relationship to utilities identified.
Navy – CERCLA Operable Unit 2 Site F	Located within or adjacent to NAVBASE Kitsap-Bangor Proposed Action areas.	No reasonably close causal relationship to utilities identified.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Alternate Power Transmission Line	The transmission line would extend from a commercial electrical power source at Clear Creek Road to a Bangor substation. Exact location TBD.	The project would provide a backup power source for NAVBASE Kitsap-Bangor, and would include a new transmission line and new equipment.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; PFAS = per and polyfluoroalkyl substances; RFFA = reasonably foreseeable future action; UXO = unexploded ordnance

Sources: Navy 2019c, 2019d, 2020a, 2020b, 2022b, 2022c, 2022d,

3.11.3 Environmental Consequences

This section evaluates potential impacts to utilities associated with implementation of the alternatives. The effects analysis evaluated the potential for beneficial or adverse impacts in consideration of the BMPs listed in Table 3.11-5 and Table 3.11-6 with detailed descriptions of each BMP contained in Appendix A. The BMPs are measures that the Navy would implement to reduce the environmental impacts of designated activities, functions, or processes.

Table 3.11-5 Utilities Best Management Practices at NAVBASE Kitsap-Bremerton

BMP	*Impacts Reduced/Avoided*	*Description*	*Applicability*
UTIL MGMT BREM-1	Downtime and interruption of utility service	Construction and testing of new utilities would occur prior to the turnover from old utility lines to new utility lines to minimize disruption to services and operational impacts to the shipyard. To help minimize downtime and interruptions, temporary and permanent infrastructure would be built to the fullest extent possible, prior to turnover occurring.	Construction
UTIL MGMT BREM-2	Impacts to shipyard operations and other military operations	Utility turnovers would be made outside of normal working hours or on weekends to minimize disruption to the existing utility services and shipyard operations.	Construction
UTIL MGMT BREM-3	Impacts to shipyard operations and other military operations	Shops, codes, and shipyard employees would be notified a minimum of 72 hours prior to any utility service disruption to allow for adequate planning.	Construction

Legend: BMP = best management practice

Table 3.11-6 Utilities Best Management Practices at NAVBASE Kitsap-Bangor

BMP	*Impacts Reduced/Avoided*	*Description*	*Applicability*
UTIL MGMT BANGOR-1	Downtime and interruption of utility service	Construction and testing of new utilities would occur prior to the turnover from old utility lines to new utility lines to minimize disruption to services and operational impacts to the shipyard. To help minimize downtime and interruptions, temporary and permanent infrastructure would be built to the fullest extent possible, prior to turnover occurring.	Construction
UTIL MGMT BANGOR-2	Impacts to military operations	Utility turnovers would be made outside of normal working hours or on weekends to minimize disruption to the existing utility services and shipyard operations.	Construction
UTIL MGMT BANGOR-3	Impacts to military operations	Shops, codes, and shipyard employees would be notified a minimum of 72 hours prior to any utility service disruption to allow for adequate planning.	Construction

Legend: BMP = best management practice

3.11.3.1 Nature and Type of Effects

The impacts on utilities from the action alternatives could include (1) service disruption during construction and during permanent relocation of existing critical facilities, and (2) reaching or exceeding service capacity because of new project-related demands (system loads).

Final peak loads for various utilities systems are not available. These loads would be determined as the design process moves forward. Coordination and collaboration with utility providers and determining the need for infrastructure improvements beyond installation boundaries would be resolved during final design.

3.11.3.2 Impact Assessment Methodology

The Navy assessed the potential for interruption, temporary relocation, or permanent relocation of existing utilities by evaluating the overlap of construction-related actions with existing utilities. Effects were considered substantial if disruption of a major utility occurred for more than 12 consecutive hours. For the purposes of this analysis, the Navy assumed that utility demand would be met through project design.

3.11.3.3 Impact Analysis for Alternative 1: No-Action

Under Alternative 1, the Proposed Action would not proceed. No project-related impacts to utilities would occur with implementation of the no-action alternative.

3.11.3.4 Impact Analysis for Alternative 2 (Preferred Alternative)

This analysis is based on conceptual design information. As facility designs are finalized, the Navy would incorporate measures to accommodate new demands/loads for each utility and minimize short-term utility service disruptions.

Construction-related Impacts

Utilities for Alternative 2 would be constructed, relocated, or decommissioned according to the regulatory design criteria as summarized in Table 3.11-7.

Table 3.11-7 Summary of Design Criteria

Design Criteria	*Citation*	*Summary*
UFC 4-152-01 Design: Piers and Wharves	DoD 2017	Used for utilities requirements to support ships and submarines.
UFC 4-150-02 Dockside Utilities for Ship Service	DoD 2020	Used for utilities requirements for M2D2. Used for utilities locations and connections.
UFC 4-213-10 Graving Dry Docks	DoD 2020b	Used for utilities requirements for M2D2.
UFC 3-580-01 Information and Communications Technology Infrastructure Planning and Design	DoD 2024	Used for telecommunications requirements.
UFC 3-201-01 Civil Engineering, with Change 5	N/A	Used for general design and construction.
UFC 3-210-10 Low Impact Development, with Change 3	N/A	Used for general design and construction.
UFC 3-230-01 Water Storage and Distribution with, Change 3	N/A	Used for utilities design of water systems.
UFC 3-240-01 Wastewater Collection and Treatment, with Change 2	N/A	Used for wastewater design of wastewater systems.
UFC 3-501-01 Electrical Engineering, with Change 1	N/A	Used for electrical design and analysis criteria.
UFC 3-550-01 Exterior Electrical Power Distribution, with Change 3	N/A	Used for electrical design of exterior power distribution.
UFC 3-530-01 Interior and Exterior Lighting Systems and Controls, With Change 4	N/A	Used for lighting design of lighting systems.
PW6 600-01 Public Works Utility Criteria for Design and Construction: Electrical, Sewer and Water	NAVFAC 2018	Used for utilities design, layout, and demand requirements. Used for material requirements.

Legend: DoD = Department of Defense; M2D2 = multi-mission dry dock; N/A = not applicable; NAVFAC = Naval Facilities Engineering Systems Command; UFC = Unified Facilities Criteria

Removal of utility services to demolished structures and reconnection to replacement structures may result in a temporary service disruption to active facilities and permanent relocation of some utilities. Factors such as where local shutoff valves are located, utility trench width and depth, locations of new utility lines, and other factors unique to specific facilities and infrastructure conditions would determine the extent of disruptions and where they may occur. Disruption of service is anticipated to be localized to the area within and surrounding the construction site. The effects would be short-term and negligible, primarily affecting service to surrounding facilities for less than 12 hours for disconnection of utilities from facilities to be demolished/relocated and/or removal of existing utility piping to predetermined locations for construction. Systems such as the Giant Voice on the Hammerhead Crane on NAVBASE Kitsap-Bremerton, the supervisory control and data acquisition system, and the advanced metering infrastructure system would not experience any significant lapse in coverage as alternate locations for these systems would be active before any demolition of their locations takes place.

Demands on the water systems throughout construction of M2D2 is not expected to impact off-installation users but should be monitored to ensure that they do not exceed system capacity. These effects would be short-term and negligible.

To construct M2D2, the Navy would demolish the existing saltwater pump house and saltwater intake structure located west of DD3 and construct a new system east of M2D2. The current saltwater system serves DD1, DD2, DD3, DD4, and DD5 and Piers 3, 5, 6, and 7. To maintain shipyard operations during construction, the Navy would operate a temporary barge-mounted saltwater intake system until the new M2D2 saltwater system is operational. The temporary barge-mounted saltwater intake and pump system are expected to be operational before the current saltwater pump house and saltwater intake structure located west of DD3 is demolished. Therefore, no impacts to the saltwater system are expected.

Regional landfills have adequate capacity to accept the estimated volume of construction debris, though the timing of the delivery of the debris would need to be coordinated with the appropriate landfill(s) before demolition occurs (Matt Calantas, Special Waste Executive at Republic Services, personal communication, 2022). Short-term and long-term capacity effects are not anticipated.

The construction contractor would address the construction power demands as needed with multipurpose, on-site, and portable energy-generating units.

The geographic extent of temporary disruption is not expected to be installation-wide but would occur in specific locations; the extent would depend on where the disruption is located. It is anticipated that installation of new utility lines would be completed to the extent possible prior to service disruptions. Impacts would be minimized through implementation of BMPs to reduce disruptions (Appendix A, BMPs UTIL MGMT -1, -2, and -3) and are considered short-term and negligible.

Impacts on NAVBASE Kitsap-Bangor associated with the Radio Hill complex expansion and new forge shop would involve adding utilities along the new access road that would be specified during final design. Details regarding utility needs would be established during final design. Service disruptions are not anticipated or would be limited to less than 12 hours.

Operation-related Impacts

Upon completion of construction, all utilities would be installed and functional.

Upgrades to the dry dock floor and the groundwater relief systems are expected to decrease the amount of saltwater collected by the process water collection system. The amount of process water produced under Alternative 2 at NAVBASE Kitsap-Bremerton would be approximately 16 percent higher than current conditions, which would require increased storage and treatment of process water prior to potential release into Sinclair Inlet or discharge into the sanitary sewer. The Navy currently discharges process water treated by existing process water/oily waste treatment system (PWOWTS) plants to the sanitary sewer. The addition of treatment technologies to the PWOWTS to remove metals would result in treated oily wastewater and process water that would meet National Pollutant Discharge Elimination System-permitted limits for discharge to Sinclair Inlet and State Waste Discharge permit limits for discharge to the sanitary sewer. The final design is expected to accomplish the following:

- Ensure adequate sanitary sewer capacity to handle direct discharge of process water to the sanitary sewer without treatment.
- Reduce the volume of high-salinity wastewater to the sanitary sewer.
- Increase the quality of water being discharged to Sinclair Inlet due to the reduced volume of untreated process water discharged to Sinclair Inlet during heavy rain days as a result of the increased process water storage capacity.

No remaining process water impacts would be anticipated after M2D2 is built.

Alternative 2 would include a new saltwater pump house east of M2D2 and a new saltwater intake structure on the shoreline east of M2D2. No impacts to the saltwater distribution system are anticipated after M2D2 is built.

Short-term and long-term capacity issues are not anticipated for the NAVBASE Kitsap-Bremerton sanitary sewer system except for Lift Station 8, which may exceed the sanitary system capacity under certain conditions. Design and operational refinements to address this capacity issue would be addressed in later design phases. Revisions to the sewer contract with the City of Bremerton would be evaluated, if needed.

New electrical and mechanical utilities would serve the operational demands and overall system loads, which would increase with operation of the project. Backup power would be addressed in the final design details and/or by the long-term presence of multipurpose, on-site, and portable energy-generating units. Total electricity loads, especially contributions associated with M2D2 operations (pumps, chillers, heat exchangers, and other facilities), may require off-installation utility infrastructure service improvements and related delivery demand discussions.

Effects from RFFAs would add to incremental impacts on utility systems. These effects would be addressed individually through standard design and approval processes applicable to each improvement.

Based on preliminary project design, no off-installation impacts to utilities are currently anticipated from Alternative 2 operation.

Effects Associated with Reasonably Foreseeable Future Actions

RFFAs could have an additive impact on utility capacity and increasing or decreasing demand. When combined with RFFAs, there could be an additive impact from disruption during construction activities.

3.11.3.5 Impact Analysis for Alternative 3

This analysis is based on conceptual design information. As facility designs are finalized, the Navy would incorporate measures to accommodate new demands/loads for each utility and minimize short-term utility service disruptions.

Construction-related Impacts

Many of the potential impacts for Alternative 3 are like those associated with Alternative 2. However, Alternative 3 does not include additional saltwater pumps and would continue using the current saltwater process system.

Demands on the water systems throughout construction of M2D2 and the wharf at the east wall are not expected to impact off-installation users but should be monitored to ensure that they do not exceed system capacity. These effects should be resolved during final design and would be considered minor.

Construction of a parking structure on NAVBASE Kitsap-Bremerton, along with the demolition and reconstruction of buildings and utility systems and replacement construction involving the list of buildings defined in Chapter 2, would involve the potential for on-installation utility service disruptions and require utility connections from nearby systems. Details regarding utility needs would be established during final design. Service disruptions are not anticipated or would be limited to less than 12 hours. Utility demand calculations and service requirements would be resolved during final design.

No off-installation utility system improvements are anticipated. This would be confirmed when design details are available and associated loads can be determined.

Impacts to NAVBASE Kitsap-Bangor would be similar to those in Alternative 2, except that the forge shop and its parking area would not be built under Alternative 3.

Operation-related Impacts

NAVBASE Kitsap-Bremerton operation-related impacts under Alternative 3 are virtually the same as under Alternative 2. The amount of process water produced under Alternative 3 would be approximately 33 percent higher than current conditions. The system design would accommodate this anticipated increase.

Effects Associated with Reasonably Foreseeable Future

RFFAs could have an additive impact on utility capacity and increasing or decreasing demand. When combined with RFFAs, there could be an additive impact from disruption during construction activities.

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3.12 Transportation

This section analyzes the potential impacts of the Proposed Action (all alternatives analyzed in the EIS) to vehicular traffic, along with bicycle, pedestrian, transit, parking, and freight network issues as they relate to access, at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, Washington. Potential traffic impacts associated with the construction and operation of the proposed project are evaluated.

Traffic is commonly measured through average daily traffic and design capacity. These two measures are used to assign a roadway with a corresponding level of service (LOS). The LOS designation is a professional industry standard used to describe the operating conditions of a roadway segment or intersection. The LOS is defined on a scale of A to F that describes the range of operating conditions on a particular type of roadway facility. LOS A through LOS B indicates free flow travel. LOS C indicates stable traffic flow. LOS D indicates the beginning of traffic congestion. LOS E indicates the nearing of traffic breakdown conditions. LOS F indicates stop-and-go traffic conditions and represents unacceptable congestion and delay.

3.12.1 Regulatory Setting

The Military Surface Deployment and Distribution Command Transportation Engineering Agency provides the DoD with transportation engineering, policy guidance, research, and analytical expertise. Table 3.12-1 provides a description of the existing regulatory environment for transportation at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.12-1 Regulatory Setting for Transportation

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
Transportation and Traffic Management	DoD Directive 4500.9
Transportation Engineering	DoD Directive 4510.11
State	
Motor vehicle size, weight, load	RCW Title 46 – Motor Vehicles, Chapter 46.44
Transportation of hazardous materials	RCW Title 46 – Motor Vehicles, Chapter 46.48
Rules, penalties, and responsibility for compliance regarding transportation of hazardous materials.	RCW section 46.48.175

Law, Regulation, or Guidance	*Regulatory Citation*
Local	
Traffic impact analysis reports required by the City of Bremerton (Ord. 4856 section 5 (in part), 2003).[2]	City of Bremerton TRANSPORTATION DEVELOPMENT CODE, Chapter 11.12.060 TRAFFIC IMPACT ANALYSIS REPORTS
The City Engineer shall impose conditions necessary to mitigate all impacts of traffic, circulation, and parking resulting from a project. (Ord. 4856 section 5 (in part), 2003).[2]	City of Bremerton TRANSPORTATION DEVELOPMENT CODE, Chapter 11.12.070 TRAFFIC IMPACT MITIGATION (a)

Legend: DoD = Department of Defense; RCW = Revised Code of Washington

3.12.2 Affected Environment

The ROI for transportation associated with NAVBASE Kitsap-Bremerton is depicted in Figure 3.12-1. The ROI covers the transportation network within and surrounding the Sinclair Inlet.

Figure 3.12-2 provides a more detailed view of NAVBASE Kitsap-Bremerton. Transportation features are identified for the following areas:

- Transportation corridors providing regional and local access to NAVBASE Kitsap-Bremerton, including maritime access via the Washington State Ferry System and Kitsap Transit Ferry System, and to NAVBASE Kitsap-Bangor
- NAVBASE Kitsap-Bremerton existing parking
- NAVBASE Kitsap-Bremerton gate access points
- Transportation corridors leading directly to NAVBASE Kitsap-Bremerton access points
- Transportation corridor internal to NAVBASE Kitsap-Bremerton that provides pathways to the proposed construction areas

Figure 3.12-3 shows the regional setting for NAVBASE Kitsap-Bangor and the regional roadway network. The Proposed Action only relates the portion of NAVBASE Kitsap-Bangor on the east side of Hood Canal. The two entrance routes to NAVBASE Kitsap-Bangor from SR-3 are either NW Trigger Avenue or NW Luoto Road. The Navy improves and maintains internal roads. SR 3 and SR 303 connect NAVBASE Kitsap-Bangor to NAVBASE Kitsap-Bremerton and to locations to the south and east. Virtually all traffic associated with the Proposed Action and alternatives would use these routes. SR 3 connects to SR 104 to the north. SR 104 crosses Hood Canal and connects NAVBASE Kitsap-Bangor to locations farther north and west. There are few to no significant trip generators for NAVBASE Kitsap-Bangor to the north and west of the installation due to the presence of Olympic National Park, Olympic National Forest, and the Pacific Ocean. Consequently, the ROI for NAVBASE Kitsap-Bangor is limited to the roadway network within the NAVBASE Kitsap-Bangor installation and SRs 3 and 303 until these routes reach the NAVBASE Kitsap-Bremerton ROI boundary.
The following features for each of these ROI areas are described in this section:

- Physical characteristics of transportation corridors
- Operational characteristics of transportation corridors
- Existing constraints of transportation corridors

[2] Does not apply to NAVBASE Kitsap-Bangor.

Adhering to a multimodal transportation[3] approach, these features are described by the transportation mode appropriate to the area: vehicular traffic, transit service, bicycle facilities, and pedestrian facilities.

Parameters used to describe the transportation corridors include physical roadway configuration, vehicular volume (24-hour and peak hour volumes), vehicular LOS (link and intersection), vehicular delay, vehicular queuing (related to gate access and ferry traffic affecting gate access), type of intersection traffic control, transit frequency of service (peak buses per hour), transit period of service, type and connectivity of bicycle facilities, and type and connectivity of pedestrian facilities. Also noted for the transportation corridors is the existence of adjacent residential and commercial development.

3.12.2.1 Existing Conditions

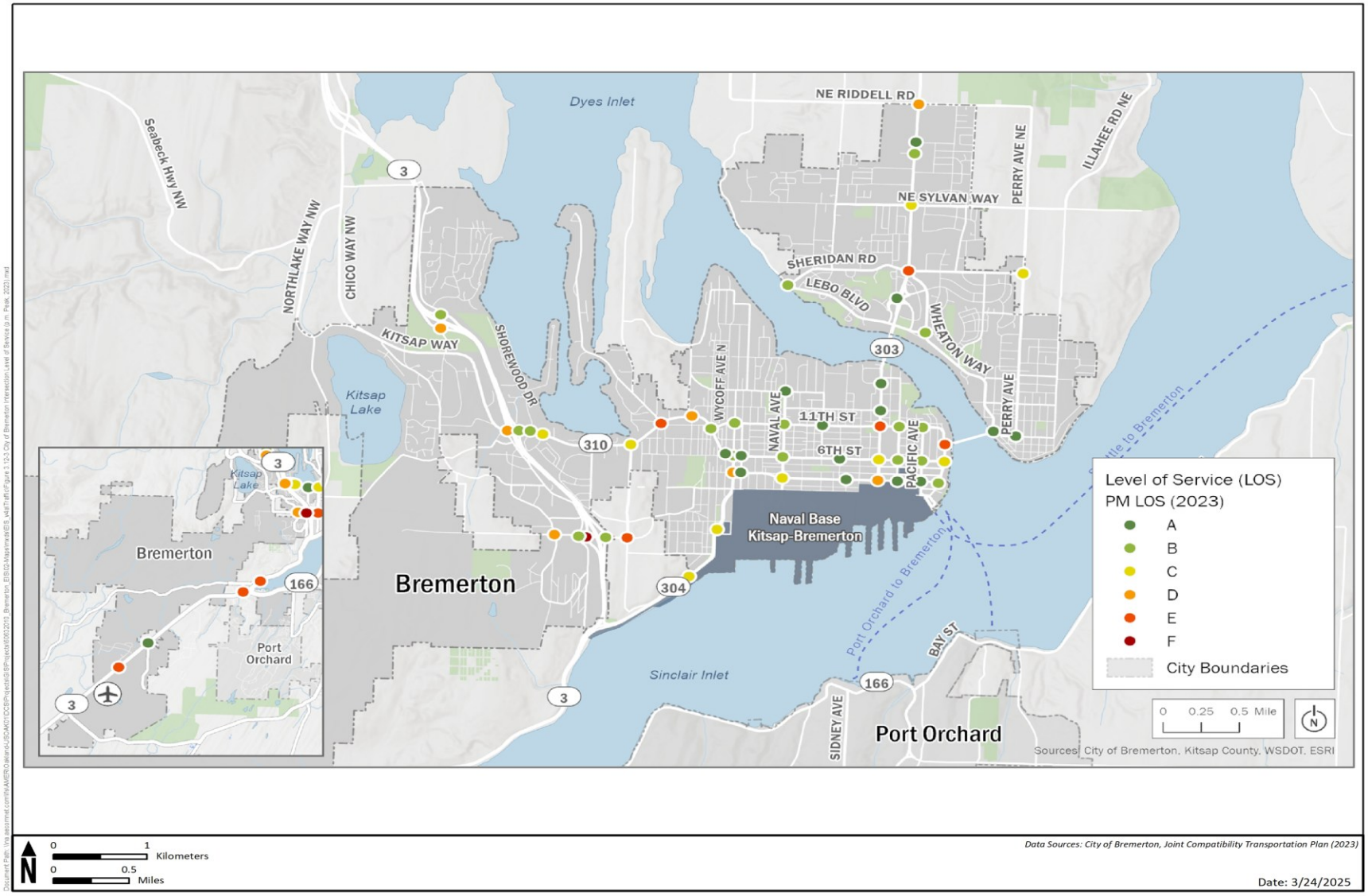
NAVBASE Kitsap-Bremerton

Land Uses

It is important to consider land uses within the context of transportation and traffic because it provides insight into areas where people may concentrate their travel. The commercial areas in Bremerton, where people commonly shop, are located downtown, within the East Bremerton area, and west of SR 3; these areas are zoned for commercial and residential uses. Downtown and East Bremerton are linked by the Manette Bridge and Warren Bridge; properties within these areas are zoned "Downtown Regional Center" and "Manette Neighborhood Center," and include various subarea plans and residential areas. Other areas of commercial and industrial land use are in the western portions of the city along Burwell Street, 6th Avenue, and Kitsap Way. Much of the remaining city area is zoned for single-family residential, multi-family residential, institutions, and NAVBASE Kitsap-Bremerton.

[3] Multimodal transportation includes walking, bicycling, public transit (bus and ferry), and driving.

Figure 3.12-1 Transportation Overview – NAVBASE Kitsap-Bremerton



Source: City of Bremerton 2023.

Figure 3.12-2 City of Bremerton Intersection Level of Service (p.m. Peak, 2023)

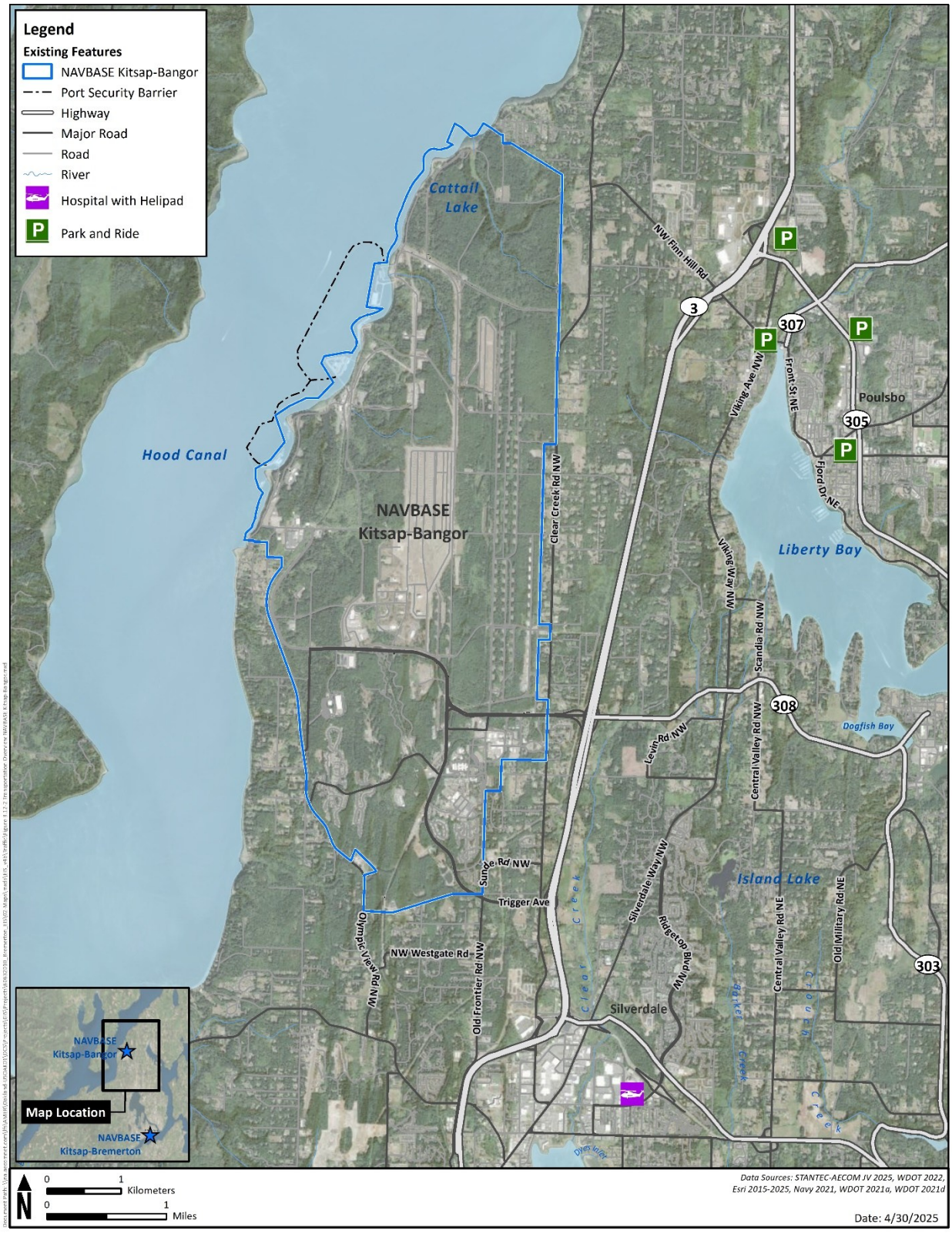


Figure 3.12-3 Transportation Overview – NAVBASE Kitsap-Bangor

Activity Centers/Key Destinations

With over 31,000 active-duty military, civilians, and contractors, NAVBASE Kitsap-Bremerton is the largest single employer in Kitsap County.[4] Situated in the middle of the City of Bremerton, NAVBASE Kitsap-Bremerton creates a high level of multimodal transportation demand. Currently, heavy congestion exists on corridors leading to NAVBASE Kitsap-Bremerton during the weekday morning and afternoon peak hours, especially along Burwell Street.

The Bremerton Transportation Center and Ferry Terminal are adjacent to NAVBASE Kitsap-Bremerton to the east. Both NAVBASE Kitsap-Bremerton and the Transportation Center create high levels of multimodal transportation demand during peak hours (City of Bremerton 2023). Vehicular travel is the primary choice for most travelers in and around Kitsap County) and driving alone represents 69 percent of the commute mode. However, for those traveling to NAVBASE Kitsap-Bremerton, the drive alone mode share decreases to 62 percent (City of Bremerton 2023). Additionally, downtown Bremerton, the Kitsap Conference Center, Olympic College, and the Ferry Terminal are major trip generators near NAVBASE Kitsap-Bremerton.

Road Network

The principal arterial streets are Burwell Street and 11th Street. Minor arterials include Naval Avenue and 6th Street. Collector roadways include but are not limited to High Avenue and Park Street.

All intersections analyzed in the City of Bremerton Comprehensive Plan (2016) met the city's current LOS standards. However, The City of Bremerton, through a DoD Office of Economic Adjustment Grant, completed the Joint Compatibility Transportation Plan (JCTP) in 2023. The plan's intent is to "create a responsive and actionable plan to address transportation issues in Bremerton and ensure Bremerton's growth does not impede NAVBASE Kitsap-Bremerton missions" (City of Bremerton 2021). As a part of this study, the plan examines existing and future needs related to all transportation modes serving NAVBASE Kitsap-Bremerton and, specifically, to evaluate options to mitigate transportation and parking demands. The Bremerton City Council approved the final report on December 13, 2023. This plan:

- Examines existing and future needs related to all transportation modes serving NAVBASE Kitsap-Bremerton, including parking, pedestrian, and transit facilities.
- Develops solutions to resolve deficits.
- Evaluates options to mitigate transportation and parking demands.
- Develops a prioritized implementation plan.

The final JCTP includes a preferred alternative, which outlines "improvements that address the study goals and the existing and future needs for transportation projects" related to NAVBASE Kitsap-Bremerton operation such as:

- Build active transportation projects that facilitate modal shift for commute trips to downtown Bremerton and NAVBASE Kitsap-Bremerton.
- Add parking in strategic locations outside of downtown.
- Develop and implement parking policies that improve and reduce NAVBASE Kitsap-Bremerton commuter parking in downtown and adjacent neighborhoods.

[4] http://kitsapeda.org/key-industries/defense.

- Build transit capacity and reliability.
- Encourage mode shift using downtown parking strategies, education, and employer incentives.
- Improve inbound capacity at NAVBASE Kitsap-Bremerton gates to minimize local roadway congestion and to improve air quality.

The following intersections, in 2020, were close to or exceeded the acceptable maximum vehicle delay of the City standards:[5]

- Chester Avenue and Burwell Street (SR 304) (LOS D during a.m. peak, LOS E during p.m. peak)
- Warren Avenue (SR 303) and 11th Street (LOS D during a.m. peak, LOS F during p.m. peak)

These intersections are located along key east-west and north-south corridors. SR 303 is a three- to four-lane principal arterial road that extends from Burwell Street (SR 304) in Bremerton to Waaga Way (SR 3/SR 303) at its northern terminus in Silverdale.

Intersections within two blocks of the NAVBASE Kitsap-Bremerton gates were considered, and did not include gates:

- Washington Avenue/1st Street
- Pacific Avenue/Burwell Street
- Burwell Street/Chester Avenue
- Burwell Street/State Street
- Burwell Street/Naval Avenue
- Burwell Street/Montgomery Street
- 1st Street/Callow Avenue – Charleston Street
- Charleston Boulevard/Farragut Street

The three main vehicle gates, Naval, Montgomery, and Charleston gates, each experience significant traffic during the a.m. and p.m. peak periods. According to the JCTP:

> Vehicle queues at NAVBASE Kitsap-Bremerton entry gates sometimes cause back-ups on City streets. Additionally, there are multiple locations where queues exceed available storage capacity, including intersections that operate within City standards. Long queues block business driveway access, increase travel times for both GP [general purpose] traffic and transit, and can lead to cut-through traffic in neighborhoods.

[5] According to the Transportation Appendix of the City of Bremerton 2016 *Comprehensive Plan* (City of Bremerton 2016), the City has a LOS standard of LOS E or better, except along routes that are a WSDOT Highway of Statewide Significance. Three routes within the City are Highways of Statewide Significance: SR 3, SR 304, and SR 310. For intersections along the mainline of these routes, the LOS standard is LOS D. SR 303 is classified as a Highway of Regional Significance, with a LOS standard of LOS E. These standards remain in place in 2025.

Bicycle and Pedestrian Network

The presence and conditions of sidewalks vary considerably throughout Bremerton (Figure 3.12-4). Sidewalks are generally available along all arterials, streets within the central business district, and in newer subdivisions. However, many older parts of the community and recently annexed areas have incomplete sidewalks or sidewalks in need of repair. Sidewalk locations and quality are also inconsistent near high-priority pedestrian areas such as schools and major employers, which creates challenges for children walking to school and residents commuting to work by foot or transit. In addition, critical links such as the Warren Avenue Bridge need sidewalk and Americans with Disabilities Act improvements.

Currently, bicycle facilities are limited to shared lane use markings on a few roadways and designated bicycle lanes on Kitsap Way/SR 310 north of NAVBASE Kitsap-Bremerton; 11th Street/Washington Avenue and Manette Bridge; and Charleston Boulevard leading into NAVBASE Kitsap-Bremerton, as well as shared use paths and trails within city parks (Figure 3.12-5).

The City of Bremerton enacted a Complete Streets Ordinance in 2018 and has the following projects underway (as of September 2022):

- Warren Avenue Bridge Multimodal project to improve walking and no-motorized features.
- Upgrading Naval Avenue from the Naval Avenue Gate north to 15th Street. Project includes pavement resurfacing, bicycle lanes, boxes and detection, wider sidewalks, signal timing and phasing, intersection treatments, curb bulbs, wayfinding signage, pavement markings, and modified storm drainage (in Design – 60 percent complete).
- Washington Avenue and 11th Street Improvements – Creating an interconnected multimodal network, completing a link in the Bridge-to-Bridge trail between Manette Bridge and Evergreen Park.

Public Transit Network

Public transit in Bremerton consists of fixed-route bus and ferry services provided by Kitsap Transit, Mason Transit, and Washington State Ferries (Figure 3.12-6). Kitsap Transit provides local, limited, and shuttle bus transit service, including the Kitsap Fast Ferries. Most transit riders (including NAVBASE Kitsap-Bremerton active duty, civilian employees, and the public) access Kitsap Transit service by walking to transit from their homes or by driving to a designated park and ride facility, or on-street parking, and then walking to connect to transit. In addition, Kitsap Transit operates the "Worker/Driver" bus system, which started during World War II to carry employees to NAVBASE Kitsap-Bremerton (and now also serves NAVBASE Kitsap-Bangor). The buses operate in a similar fashion to a carpool program but operate on a fixed route. There are currently 25 routes serving the greater Kitsap County area from south Port Orchard to Kingston. These buses are open to the general public, but everyone must have security clearance to enter the installation.

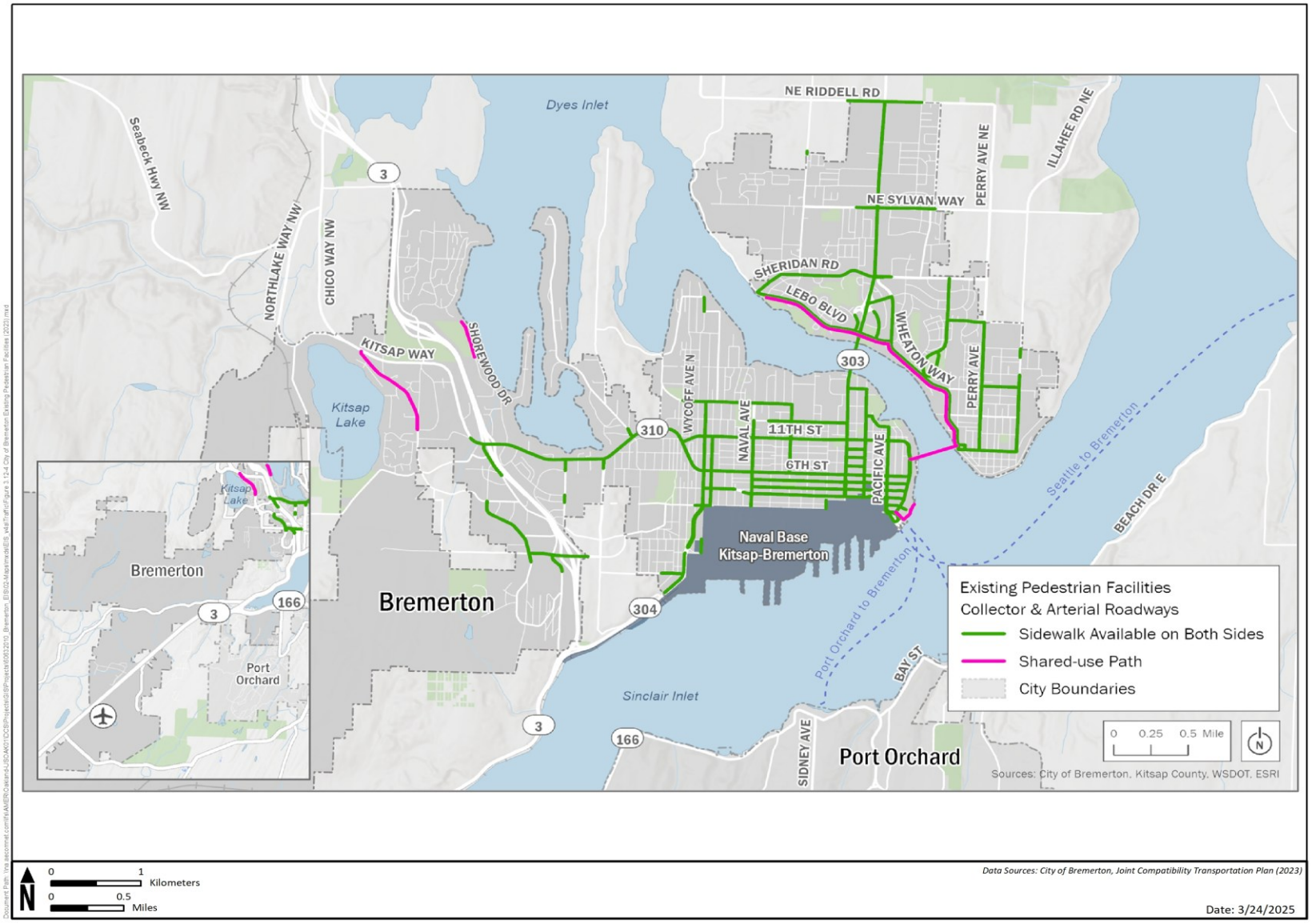


Figure 3.12-4 City of Bremerton Existing Pedestrian Facilities (2023)

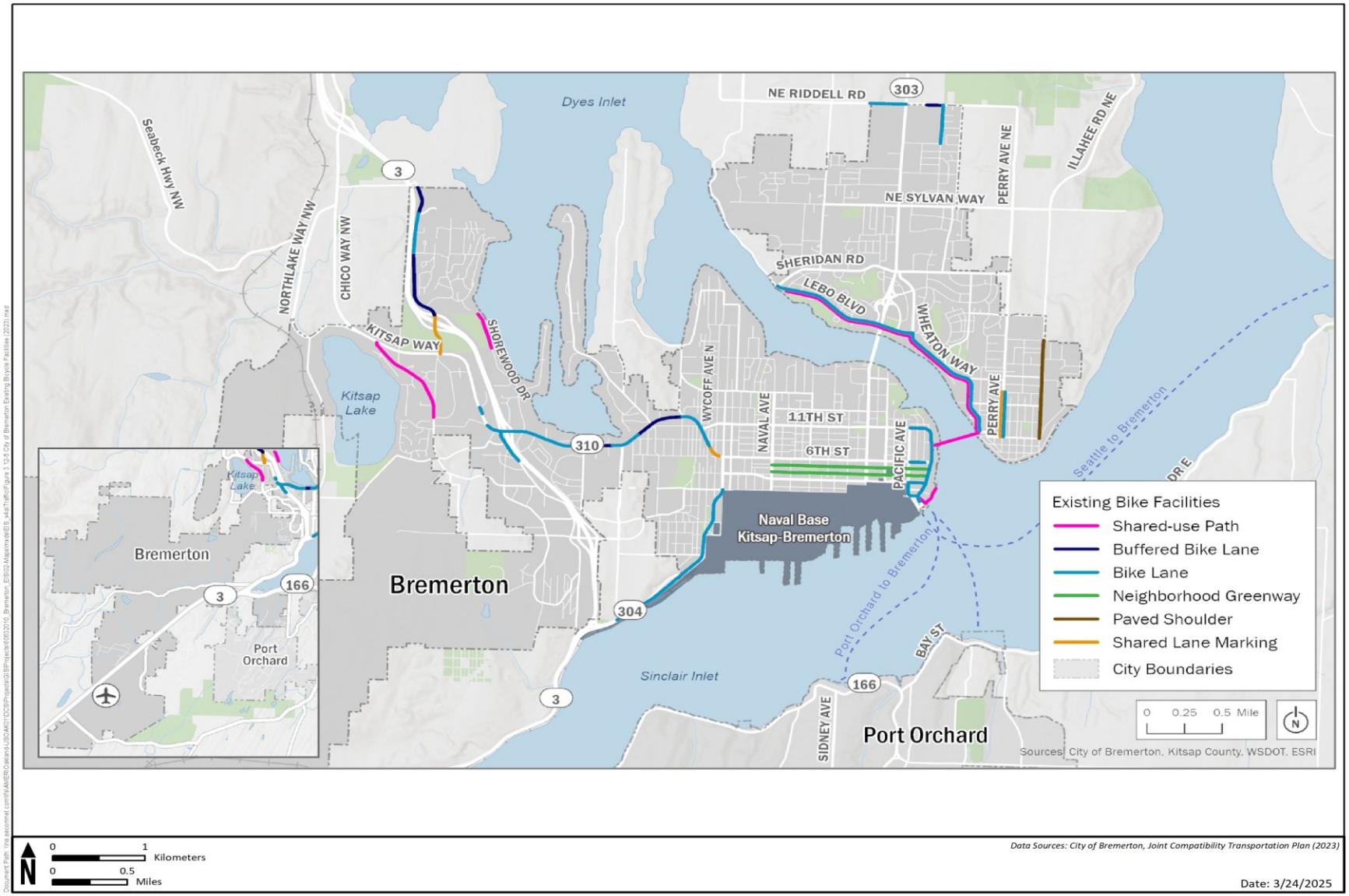


Figure 3.12-5 City of Bremerton Existing Bicycle Facilities (2023)

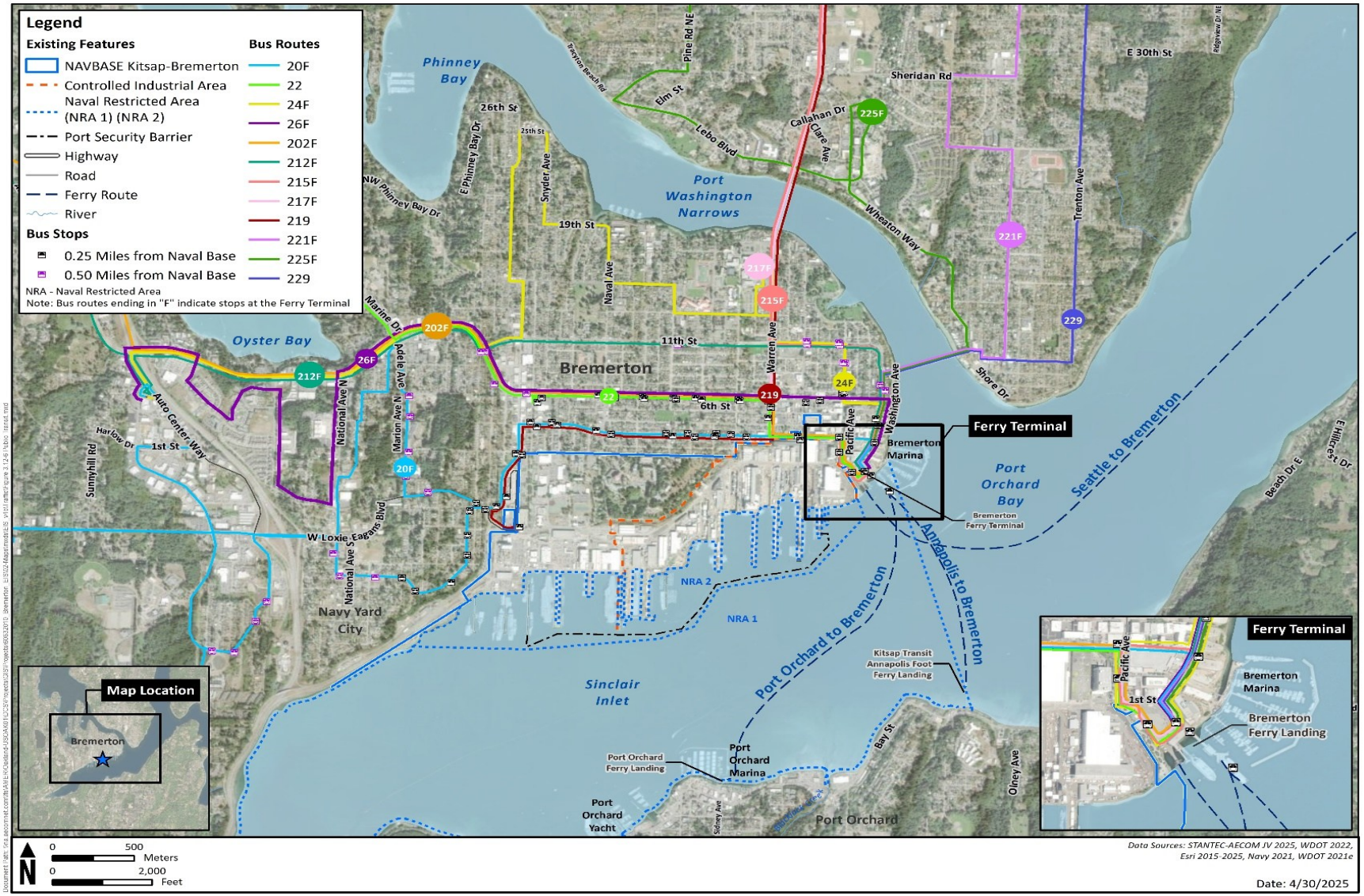


Figure 3.12-6 Public Transit

Kitsap Transit, including Kitsap Fast Ferries (20 daily trips from 5:20 a.m. to 9:40 p.m., 1 trip every 40 minutes, pedestrian only), Mason Transit, and the Washington State Ferries serve the Bremerton Ferry Terminal. The Washington State Ferries provide passenger and vehicular ferry service to Bremerton via the Bremerton-Seattle ferry between 6 a.m. and 10:30 p.m. There are eight daily ferries to Bremerton, departing approximately every 2 hours. Figure 3.12-6 displays the transit routes serving the NAVBASE Kitsap-Bremerton area, with bus stops shown within 0.25- and 0.5-mile radii from the installation boundary.

Freight Network

Freight movement in Bremerton occurs primarily via the state routes that serve the city (Figure 3.12-7). SR 3, SR 304, and SR 310 are identified as Washington State Department of Transportation Highways of Statewide Significance. SR 3 is a grade-separated freeway that travels through West Bremerton and is classified by the Washington State Department of Transportation as a T-1 Freight Corridor. SR 304, classified as a T-3 Freight Corridor, connects Bremerton with the Bremerton Ferry Terminal to the east and SR 3 to the west, providing access to Puget Sound Industrial Center-Bremerton and other industrial uses south of Bremerton. SR 310, another T-3 corridor, is a principal arterial that serves as an east-west distributor of freight traffic within the city.

Parking

Outside of NAVBASE Kitsap-Bremerton, parking needs for persons working on-site or utilizing services in downtown Bremerton are served by parking garages and surface parking lots. Parking issues are a prevailing concern for the City of Bremerton and the Navy. NAVBASE Kitsap-Bremerton has a known deficit of on-installation parking spaces. In addition, the JCTP identified a significant demand for both on-street and off-street parking surrounding NAVBASE Kitsap-Bremerton. One of the key findings notes, “On-street blocks near NAVBASE Kitsap-Bremerton that have an occupancy of 85 percent and above signal that parking demand exceeds parking supply. Much of the available off-street parking also has high occupancies in commuter parking areas.“ Parking duration is also a concern, with many spots occupied for over 6 hours on nearby residential streets despite 1- to 2-hour limits. This indicates long-term users move their cars throughout the day to avoid ticketing.

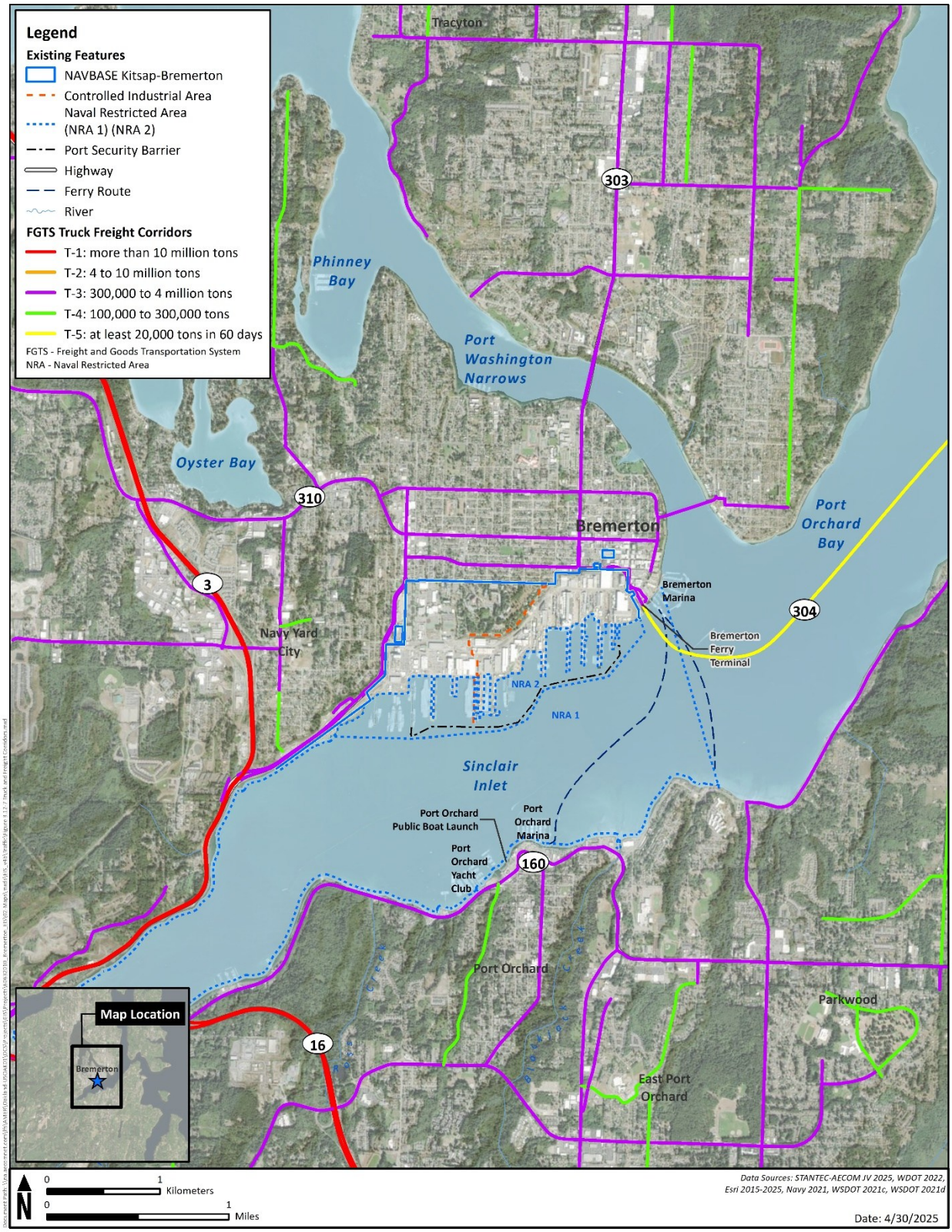


Figure 3.12-7 Truck and Freight Corridors

3.12.2.2 Effects Associated with Reasonably Foreseeable Future Actions

There are several RFFAs related to temporary increased construction-related considerations, as well as one action that may improve NAVBASE Kitsap-Bremerton access via alternative transportation modes. Table 3.12-2 summarizes the potential effects to transportation associated with RFFAs with a close causal relationship to the project at NAVBASE Kitsap-Bremerton. See Figure 3.1-1 and Figure 3.1-2 for maps of these RFFA locations.

Table 3.12-2 Effects to Transportation from Reasonably Foreseeable Future Actions on NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Pier 3 Electrical Substation Repair, PSNS & IMF	Inside the ROI	May have temporary construction impacts on installation access/traffic flow.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF and NAVBASE Kitsap-Manchester	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to transportation.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	Outside the ROI at NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	This project is not located within the project area, and there is no reasonably close causal relationship to transportation.
Navy – SIOP, PSNS & IMF	Both occur within NAVBASE Kitsap-Bremerton.	Construction traffic for the SIOP actions may overlap in time with construction traffic for this project.
Navy – Operable Unit B Marine Source Removal Actions	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to transportation.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	Outside the ROI. NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	This project is not located within the project area, and there is no reasonably close causal relationship to transportation.
Navy – Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to transportation.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	Occurs within the ROI for project traffic.	May result in temporary street closures leading to NAVBASE Kitsap-Bremerton, thereby increasing traffic on surrounding streets.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Occurs within the ROI for project traffic.	May improve facilities and access for bicycles and pedestrians to NAVBASE Kitsap-Bremerton. May modify traffic flow through intersections in traffic ROI.
Port of Bremerton - Marina Breakwater Replacement, Port Orchard Marina	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to transportation.
Private Development – The Beacon and Beacon II	Occurs within the ROI for project traffic.	May result in increased background traffic near the project

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Private Development – McWilliams Apartments	Occurs within the ROI for project traffic.	May result in increased background traffic near the project

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; NSC = Naval Supply Center; PFAS = per and polyfluoroalkyl substances; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; SIOP = Shipyard Infrastructure Optimization Program

Sources: Navy 2018a, 2018b, 2019a, 2019b, 2021a

NAVBASE Kitsap-Bangor

The applicable affected environment (ROI) for NAVBASE Kitsap-Bangor transportation involves the two primary access routes described previously as part of the ROI and the local roadway network within the installation. NAVBASE Kitsap-Bangor is not densely developed and includes large, forested areas. The local roadway network includes northwest Luoto Road and Trigger Avenue. These roads provide access through the installation and connect to Highway 3 interchanges. Thresher Avenue passes through the installation with a connection to Trigger Avenue and Olympic View Road northwest. Olympic View Road is a north/south route on the western side of the installation. Unlike NAVBASE Kitsap-Bremerton, where the City of Bremerton is immediately adjacent to the installation, NAVBASE Kitsap-Bangor is rural and low density in character. Pedestrian and bicycle access issues and facilities; parking demand at peak periods; traffic volumes and associated congestion during a.m. and p.m. peak periods; and transit are not substantial issues with the installation or nearby relative to the Proposed Action and alternatives.

The RFFAs for NAVBASE Kitsap-Bangor are summarized in Table 3.12-3. See Figure 3.1-3 for a map of these RFFA locations.

Table 3.12-3 Effects to Transportation from Reasonably Foreseeable Future Actions on NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy - Transit Protection Program Support Facilities	To occur within NAVBASE Kitsap-Bangor.	May have temporary construction impacts on installation access/traffic flow.
Navy - Child Development Center	To occur within NAVBASE Kitsap-Bangor.	May have temporary construction impacts on installation access/traffic flow.
Navy - Military Working Dog Kennel Replacement	To occur within NAVBASE Kitsap-Bangor.	May have temporary construction impacts on installation access/traffic flow.
Navy - Repair Substation 5	To occur within NAVBASE Kitsap-Bangor.	May have temporary construction impacts on installation access/traffic flow.
Navy - Tang Road Repair	To occur within NAVBASE Kitsap-Bangor.	May have temporary construction impacts on installation access/traffic flow.
Navy - Equipment Processing Building	To occur within NAVBASE Kitsap-Bangor.	May have temporary construction impacts on installation access/traffic flow.
Navy - Relocate Flier Road	To occur within NAVBASE Kitsap-Bangor.	May have temporary construction impacts on installation access/traffic flow.
Navy – CERCLA actions for PFAS	Outside the ROI	These efforts are not located within the project area, and there is no reasonably close causal relationship to transportation.
Navy – CERCLA Operable Unit 1 Site A	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to transportation.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – CERCLA Operable Unit 2 Site F	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to transportation.
Navy – Alternate Power Transmission Line	Outside the ROI	This project is not located within the project area, and there is no reasonably close causal relationship to transportation.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; ROI = Region of Influence; UXO = unexploded ordnance

3.12.3 Environmental Consequences

The following discussion addresses the transportation effects of the alternatives and what is anticipated at the NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor sites.

An analysis of the impacts to ground traffic and transportation considers the possible changes to existing traffic conditions and the capacity of area roadways with proposed increases in commuter and construction traffic. The primary modes of travel for construction workers are expected to be drive alone and ferry.

The alternatives would not result in a permanent increase to NAVBASE Kitsap-Bremerton or CIA populations, or employment figures as described in Chapter 2, and future day-to-day operations of the installation are projected to remain the same as today. Therefore, the analysis is focused on construction phase effects rather than the facility's operational effects.

A minor increase in trip generation is anticipated on NAVBASE Kitsap-Bangor due to the relocation of the forge shop and expansion of the Radio Hill complex. Navy experience with recent major construction projects at NAVBASE Kitsap-Bangor (EHW-2 and Waterfront Security Enclave) indicated that construction traffic did not result in adverse impacts to traffic flow on public roadways near the base, including SR-3, or significantly exacerbate peak hour congestion at base gates (Gibson 2017). Construction traffic for these projects also did not have adverse effects to traffic flow on base roads or result in shortages of parking for base employees. Similarly, the forge shop project also is not expected to have adverse impacts to traffic for on-base roadways or public roadways near the base. This would be due in part to the current acceptable LOS on the base roadways that forge shop-generated traffic would use. No substantive roadway capacity issues are anticipated.

The effects analysis evaluated the potential for beneficial or adverse impacts in consideration of BMPs presented in Table 3.12-4, with detailed descriptions of each BMP contained in Appendix A. The BMPs are measures that the Navy would implement to reduce the environmental impacts of designated activities, functions, or processes.

Table 3.12-4 Transportation Best Management Practices

BMP	*Title*	*Applicability*
TRAFFIC MGMT – BREM/BANGOR-1	Develop Maintenance of Traffic and Traffic Control Plans in compliance with the Manual on Uniform Traffic Control Devices (MUTCD) and Work Zone Safety Guidelines	Construction

Legend: BMP = best management practice

3.12.3.1 Nature and Type of Effects

Effects to transportation infrastructure would occur with the construction of the Proposed Action; and the duration of those effects would depend on the type of activity and phase of construction in

accordance with the construction schedule for each component. Most construction equipment, construction materials, and waste would be delivered to and from NAVBASE Kitsap-Bremerton by barge to minimize congestion at shipyard gates and roads. However, the Navy expects some construction equipment, construction materials, and dredge and waste materials would arrive/depart by road through the Bremerton Gate and the vehicle inspection gate. The number of vehicles using these gates would range from 25 to 50 truck trips per day per gate. It is assumed that construction equipment generally would be confined to the construction site. Because the Bremerton Gate is primarily a pedestrian-only facility with limited vehicle usage, this construction truck traffic would be a change in gate usage.

Staging and laydown space would fall into three categories: on-site upland, on-site offshore, and off-site. The location and size of the on-site upland construction laydown areas would vary by construction activity but would be located within the CIA. On-site offshore staging and laydown space would be accomplished using barges. The location and quantity of barges would be highly variable depending on the type of construction activities occurring at any given time. Construction staging and laydown would occur off-site and expected to be at existing industrial areas within the Puget Sound area. The locations of the staging and laydown yards are discussed further in Section 2.3.2.13.

3.12.3.2 Impact Assessment Methodology

As indicated by the background project material presented in the component summary table, the operational workforce at NAVBASE Kitsap-Bremerton would generally remain at current levels if either Alternatives 2 (Preferred Alternative) or 3 were implemented. Some workers from NAVBASE Kitsap-Bremerton would be relocated to NAVBASE Kitsap-Bangor.

Assuming the workforce remains relatively constant, operational impacts would be negligible, and analyses of operational impacts is not necessary. Therefore, the landside transportation analysis focuses on construction phase transportation impacts, including material delivery impacts and worker impacts.

Under Alternatives 2 (Preferred Alternative) and 3, most construction materials and equipment would be transported to NAVBASE Kitsap-Bremerton by barge. In addition, construction workers would not be permitted to park their personal vehicles on NAVBASE Kitsap-Bremerton. Therefore, no parking resources would be needed for construction workers on the installation, and activity at entry control facilities would primarily be pedestrian related. Construction workers would presumably take public transit or drive their own car and park at an off-site parking area and then get to the worksite by foot, ferry, Kitsap County worker/driver bus, or crew boat. Construction worker mode choice assumptions are discussed in the following sections. Therefore, the construction-related, transportation system operation analysis focuses on vehicular impacts in the vicinity of NAVBASE Kitsap-Bremerton and at park and ride facilities.

Forecast Background (Non-Project) Future Traffic Volumes

To forecast background traffic for this analysis, count station data from the Washington State Department of Transportation, collected in the vicinity of the study intersections, were analyzed. Using Washington State Department of Transportation data, a compound growth rate was calculated for each of the 11 intersection areas analyzed (noted in Table 3.12-9 and Table 3.12-10). This growth rate was used with the collected traffic data to forecast future traffic volumes.

Based on information from the Puget Sound Regional Council's Vision 2050 forecasting, the Seattle metropolitan area is anticipated to grow by 1.5 million people by 2050, which will increase the demand on the transportation network across all modes. In Kitsap County, Puget Sound Regional Council

projected that 33,000 people will move to "metropolitan cities" by 2050, which is assumed to be Bremerton. An additional 34,000 would move to high-capacity transit communities, including Port Orchard, Poulsbo, Kingston, and Bainbridge Island. In March 2023, the Kitsap Daily News reported that the Kitsap Regional Coordinating Council's Land Use Technical Advisory Committee had requested Puget Sound Regional Council to recalibrate its population estimates[6]. The new estimates reduced the growth by approximately 10,000 persons in those communities. While this request did not include Bremerton, this reduction in regional growth may be anticipated to impact growth in Bremerton.

Regardless of the anticipated more conservative growth versus the original Vision 2050 plan, the potential for expansive growth should be considered in the analysis of the Proposed Action alternatives to adequately estimate its impact to the transportation network.

Forecast Construction Worker Travel

Construction-related activities at NAVBASE Kitsap-Bremerton would require an estimated workforce of anywhere from 20 to 1,000 workers per day over the life of the project. The estimate of 1,000 construction workers (maximum) onsite per shift would span from the start of the project to the end of construction. The No Build/Build year is assumed to be the last year of construction. To determine the maximum stress to the transportation network and determine the appropriate worst-case scenario, a conservative assumption is that at peak construction, the site would generate the need for 1,000 trips per shift across the region assigned to different routes.

Construction on NAVBASE Kitsap-Bangor would generate trips on the new roadways serving the forge shop site and the expanded Radio Hill complex within the local roadway network. It is anticipated to require up to 100 workers per day for the forge shop and up to 50 workers per day for the Radio Hill Complex Expansion.

Construction Shifts

For Alternatives 2 (Preferred Alternative) and 3, during the construction phase, two shifts are anticipated, with one shift change per day. The expected maximum number of workers is expected to be 1,000 for the construction duration under either shift condition. Depending on the type of shifts implemented, the impact to traffic at peak and non-peak period times would vary. Regardless of how the shifts are implemented, the number of workers on-site at any time are expected to be lower than the standard one-shift construction method.

The temporal distribution may be modified before construction begins; however, both shifts would be equally distributed. The proposed work shifts would be:

- **Shift 1:** 1,000 construction workers, arriving at the site by 3:00 a.m. and departing from the site at 3:00 p.m.
- **Shift 2:** 1,000 construction workers, arriving at the site by 7:00 a.m. and departing from the site at 7:00 p.m.

Shifts are not anticipated for construction of the forge shop and expanded Radio Hill complex at NAVBASE Kitsap-Bangor

[6] https://www.kitsapdailynews.com/news/poulsbo-discusses-population-employment-growth/.

Trip Distribution

The directional trip distribution of construction workers is based on data from the University of California Los Angeles Labor Center Report, *Worker Profile of City of Seattle Construction Projects* (2014), which contains demographic data gathered from 24 contractors on 33 public works projects funded by the City of Seattle for a 5-year period. According to the report, areas where construction workers reside are listed in Table 3.12-5. Based on this distribution of construction workers, the traffic origins as listed in Table 3.12-6 are assumed for daily construction vehicular traffic.

Table 3.12-5 Construction Workers Trip Origins

Area of Residence	*Percent*
City of Seattle	6
King County	25
Pierce/Snohomish County	53
Outside Tri-County	16

Table 3.12-6 Daily Construction Vehicular Traffic Origins

Traffic Origins	*Percent*
North	
Kitsap County (Bremerton, Silverdale, Poulsbo, Kingston, and others)	7.5
Snohomish County/North King County (includes Lynwood, Everett, Edmonds, and others)	37.5
East	
King County/Seattle (includes Seattle, Bellevue, Issaquah, and others)	15
South	
Kitsap (south of Sinclair Inlet) and Mason counties	7.5
Pierce and South King counties (includes Tacoma, Lakewood, Puyallup, Gig Harbor, Federal Way, Auburn, and others)	32.5

Mode Choice

The primary modes of travel for construction workers are expected to be driving alone, taking public transit, and taking the ferry. Other motorized modes (e.g., transit, app-based rideshare, motorcycle) are projected at one percent combined (10 trips per day out of 1000 construction worker trips per shift). The impacts of these other modes of transportation (pedestrian, bicycles, transit, freight movement) are estimated to be very small and are not specifically analyzed.

The remaining 99 percent of construction worker travel is broken down as follows:

- **Combination mode:** Construction workers drive their vehicles to a park and ride facility, then use public transit, shuttles, or ferries to Bremerton.
- Drive alone to parking garages and surface parking lots: Walk to NAVBASE Kitsap-Bremerton.

These mode split estimates reflect existing high levels of ferry and transit use by NAVBASE Kitsap-Bremerton workers.

The Navy expects the future construction contractor would procure one or more off-site locations for construction worker parking and staging of materials. Although the Navy cannot identify the off-site parking locations that will be available at the time of construction, this EIS analyzes potential impacts from one potential off-site parking area near the Bremerton Airport. The construction contractor could propose other sites, subject to Navy review and approval. Routes and modes of transportation that would be taken by construction workers are as follows:

- The Washington State Ferry System and Kitsap Transit's services, including the Routed Bus Network, Fast Ferry, Worker/Driver Buses, and Port Orchard Foot Ferry do not provide service in the overnight hours. Therefore, the majority of Shift 1 construction workers would be required to drive and park. Trip distribution assignments are shown in Table 3.12-7.

Table 3.12-7 Construction Worker Traffic Assignment to NAVBASE Kitsap-Bremerton

Construction Worker Traffic Assignment Route – Shift 1 (3:00 a.m. to 3:00 p.m.)	***Percent***	***Daily One-Way Traffic Volume***
Drive alone from all geographies to Bremerton. Park in City of Bremerton. Walk to NAVBASE Kitsap-Bremerton.	15	150
Drive alone from Bremerton/Kitsap County area to the Bremerton Airport parking area via SR 3 or SR 304. Ride contractor-provided shuttle to NAVBASE Kitsap-Bremerton.	30	300
Drive alone from the south through Tacoma on SR 16 to SR 3, or US 101 to SR 3, to the Bremerton Airport parking area. Ride contractor-provided shuttle to NAVBASE Kitsap-Bremerton.	40	400
Drive alone to Port Orchard Marina. Ride contractor-provided ferry to temporary ferry dock at NAVBASE Kitsap-Bremerton.	14	140
Miscellaneous motorized modes and bicycles.	1	10
Total:	100	1,000
Construction Worker Traffic Assignment Route – Shift 2 (7:00 a.m. to 7:00 p.m.)	***Percent***	***Daily One-Way Traffic Volume***
Drive alone from all geographies to Bremerton. Park in City of Bremerton. Walk to NAVBASE Kitsap-Bremerton.	10	100
Drive alone to an existing Kitsap Transit Park and Ride lot. Transit to Bremerton via Kitsap Transit bus and/or Kitsap Transit's Ferry from Annapolis or Port Orchard. Walk to NAVBASE Kitsap-Bremerton.	10	100
Drive alone, walk, or use public transit to arrive at Seattle Ferry Dock. Transit to Bremerton via Seattle-Bremerton Ferry to Bremerton (Washington State Ferries or Kitsap Transit). Walk to NAVBASE Kitsap-Bremerton.	20	200
Drive alone from Bremerton/Kitsap County area to the Bremerton Airport parking area via SR 3 or SR 304. Ride contractor-provided shuttle to NAVBASE Kitsap-Bremerton.	22	220
Drive alone from the south and east through Tacoma on SR 16 to SR 3 to the Bremerton Airport parking area. Ride contractor-provided shuttle to NAVBASE Kitsap-Bremerton.	21	210
Drive alone to Port Orchard Marina. Ride contractor-provided ferry to temporary ferry dock at NAVBASE Kitsap-Bremerton.	16	160
Miscellaneous motorized modes and bicycles.	1	10
Total:	100	1,000

Legend: NAVBASE = Naval Base; SR = State Route; US = United States

- Shift 2 trip assignments area also shown in Table 3.12-8. This accounts for some construction workers driving to and parking in Bremerton. A portion of construction workers who originate in or east of the City of Seattle would drive to the Bremerton Airport parking area. Construction workers assumed to park in Seattle and walk to the Bremerton Ferry would continue to take the ferry to the Bremerton Transportation Center and then walk to NAVBASE Kitsap-Bremerton. A portion of construction workers would drive to and park in the city of Bremerton.
- For the purpose of generating trips, it will be assumed that one construction worker = one vehicle.

Trip Assignment

Table 3.12-7 summarizes the traffic assignment for the daily construction worker trips (1,000 per shift) to NAVBASE Kitsap-Bremerton access routes based on trip distribution and travel mode assumptions as previously described.

Transportation Impact Analyses

The transportation impact analysis evaluates existing traffic conditions at intersections selected for analysis to establish baseline conditions and alternative comparisons. Analysis of the impacts of the Proposed Action on the transportation system involves the following steps:

- Analyze each alternative to identify, assess, and mitigate impacts (if applicable) from an increase in traffic as a result of implementing the alternative.
- Utilize signalized and unsignalized methods, as documented in the *Highway Capacity Manual, 6th edition*, and implemented in software such as Highway Capacity Software or Synchro/SimTraffic, to evaluate traffic operations at identified intersections.

The analysis addresses the following:

- Identify the requirements, needs, and impacts of each alternative as it relates to construction worker traffic.
- Provide recommendations for each alternative as it relates to the mitigation of construction worker traffic, if necessary.

Details of the transportation impacts analyses are available in Appendix O.

3.12.3.3 Impact Analysis for Alternative 1: No-Action

Under the no-action alternative, the Proposed Action would not proceed and there would be no changes to the transportation network other than changes associated with existing and already committed projects within the study area planned by the City of Bremerton, Kitsap County, and other government agencies. Operations would be expected to remain the same with no material increases in employment or installation population. However, as noted in Table 3.12-9, projected background traffic growth, during a.m. and p.m. peak hour, conditions would result in increased intersection delay and result in LOS F conditions at several intersections.

Table 3.12-8 Existing (2023) Conditions a.m. and p.m. Peak Hour Operations Analysis

ID	*Intersection*	*Control*	*Existing Conditions – Shift 1*				*Existing Conditions – Shift 2*			
			a.m. Peak		*p.m. Peak*		*a.m. Peak*		*p.m. Peak*	
			Delay (sec/veh)	*LOS*	*Delay (sec/veh)*	*LOS*	*Delay (sec/veh)*	*LOS*	*Delay (sec/veh)*	*LOS*
1	Viking Ave NW and SR 305	Signalized[1]	11.4	B	26.3	C	18.7	B	18.9	B
2	SR 303 and NE McWilliams Rd	Signalized	24.2	C	45.4	D	30.5	C	31.9	C
3	Alaskan Way and Yesler Way	Signalized[1]	3	A	6.5	A	5.3	A	5.2	A
4	Charleston Blvd and S Callow Ave	TWSC[2]	0	A	12	B	14.6	B	10.4	B
5	Burwell St and Warren Ave	Signalized	12.5	B	32.6	C	19.2	B	24.5	C
6	Burwell St and Pacific Ave	Signalized	6.8	A	6.2	A	7.5	A	5.5	A
7	SR 166 and Sidney Ave	Signalized	7.6	A	14.2	B	10.8	B	12.4	B
8	SW Barton St and Fauntleroy Way	TWSC[2]	8.7	A	21.5	C	15.4	C	14.1	B
9	Sam Christopherson Ave and SR 3 W	Signalized	11.3	B	67.2	**E**	22.4	C	23.7	C
10	Imperial Way and SR 3 W	Signalized	6.3	A	11.3	B	9.1	A	9.9	A
11	SE Spring Creek Rd and SE Mullenix Rd	TWSC[2]	8.8	A	39.2	**E**	16.2	C	17.5	C

Notes: **E** value denotes intersection LOS at unacceptable conditions.

[1] Highway Capacity Software 2000 results.

[2] The worst movement delay is reported for LOS.

Legend: Ave = Avenue; Blvd = Boulevard; ID = identification; LOS = Level of Service; NE = Northeast; NW = Northwest; Rd = Road; sec/veh = seconds per vehicle; SR = State Route; St = Street; SE = Southeast; SW = Southwest; TWSC = Two-way STOP-Controlled unsignalized intersection; W = West

Table 3.12-9 No Build (2030) a.m. and p.m. Peak Hour Operations Analysis

ID	*Intersection*	*Control*	*No Build Conditions (2023) – Shift 1*				*No Build Conditions (2023) – Shift 2*			
			a.m. Peak		*p.m. Peak*		*a.m. Peak*		*p.m. Peak*	
			Delay (sec/veh)	*LOS*	*Delay (sec/veh)*	*LOS*	*Delay (sec/veh)*	*LOS*	*Delay (sec/veh)*	*LOS*
1	Viking Ave NW and SR 305	Signalized[1]	11	B	29.5	C	19.5	B	19.6	B
2	SR 303 and NE McWilliams Rd	Signalized	23.7	C	48	D	30.9	C	32.6	C
3	Alaskan Way and Yesler Way	Signalized[1]	3	A	6.6	A	5.4	A	5.2	A
4	Charleston Blvd and S Callow Ave	TWSC[2]	0	A	12.6	B	15.5	C	10.7	B
5	Burwell St and Warren Ave	Signalized	12.3	B	35.7	D	20.3	C	25.7	C
6	Burwell St and Pacific Ave	Signalized	6.6	A	6.3	A	7.6	A	5.6	A
7	SR 166 and Sidney Ave	Signalized	7.5	A	14.4	B	10.8	B	12.5	B
8	SW Barton St and Fauntleroy Way	TWSC[2]	8.7	A	27.7	D	17.7	C	15.6	C
9	Sam Christopherson Ave and SR 3 W	Signalized	11.2	B	85.9	**F**	24	C	25.7	C
10	Imperial Way and SR 3 W	Signalized	6.2	A	11.5	B	9.2	A	10.2	B
11	SE Spring Creek Rd and SE Mullenix Rd	TWSC[2]	8.8	A	68.2	**F**	18.9	C	20.8	C

Notes: **F** value denotes intersection LOS at unacceptable conditions.

[1] Highway Capacity Software 2000 results.

[2] The worst movement delay is reported for LOS.

Legend: Ave = Avenue; Blvd = Boulevard; ID = identification; LOS = Level of Service; NE = Northeast; NW = Northwest; Rd = Road; sec/veh = seconds per vehicle; SR = State Route; St = Street; SE = Southeast; SW = Southwest; TWSC = Two-way STOP-Controlled unsignalized intersection; W = West

3.12.3.4 Impact Analysis for Alternative 2 (Preferred Alternative)

Construction-related Impacts

Construction workers would not be expected to have access to on-installation parking and would need to park in off-site parking lots or park and rides and take public transit, rideshare, or ferries to reach the work site. Consequently, the action alternatives would not appreciably increase traffic within the City of Bremerton, compared to existing conditions (Table 3.12-8) or if the No-Build Alternative is chosen (Table 3.12-9). Traffic operations analysis focusing on the arrival areas of construction workers from across the Puget Sound region is described in the traffic study provided in Appendix O.

The operational impact of additional traffic at spot locations near park and ride and ferry landing sites across the region is shown in Table 3.12-10. The results are presented in LOS for signalized intersections and control delay (reported in seconds per vehicle). As discussed previously, the 2030 timeframe represents the maximum impact for construction trips.

The traffic impact assessment methodology provides a peak number of construction workers traveling to the CIA each day relative to the overall construction schedule. The effects would be less when the number of workers is lower.

There would be several construction-related roadway impacts to passenger vehicles, active transportation (pedestrian and bicycles), transit, and freight networks forecasted at NAVEBASE Kitsap Bremerton or at the park and ride locations. See Section 3.12.3.6 potential mitigation for these impacts and the traffic analysis results in Appendix O for detailed information.

Trip generation for the forge shop, expansion of the Radio Hill complex, and associated facilities at NAVBASE Kitsap-Bangor was reviewed in a qualitative manner because of the relatively low traffic volumes on the local roadway network. No capacity-related effects are anticipated during construction. Final design details would resolve traffic issues at the two new intersections during and after construction.

Construction of the new forge shop at NAVBASE Kitsap-Bangor (Figure 2-3) would include open storage and a parking lot with capacity for up to 35 vehicles. An access road would also be added from the proposed forge shop location.

Operation-related Impacts

As described in Chapter 2, no primary installation operational changes are expected. Day-to-day fluctuations involving on-installation personnel will continue, and pre-construction population and employment levels would not change. Incidental impacts would be minimized through implementation of BMPs (Table 3.12-5). Based on the impact considerations shown in Table 3.12-8, no mitigation measures are required or recommended to address the transportation effects of the Proposed Action.

At NAVBASE Kitsap-Bangor, it is assumed that the expansion of the Radio Hill complex would incrementally increase traffic on the local roadway network. This would add trips through the highway interchanges and along roads within the installation, including Thresher Avenue. The anticipated trips at peak and non-peak periods are not expected to adversely impact congestion due to relatively low volumes in the area during peak and non-peak periods.

Table 3.12-10 Build (2030) a.m. and p.m. Peak Hour Operations Analysis

ID	Intersection	Control	Build Conditions (2030) – Shift 1				Build Conditions (2030) – Shift 2			
			a.m. Peak		p.m. Peak		a.m. Peak		p.m. Peak	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Viking Ave NW and SR 305	Signalized[1]	11.0	B	29.5	C	21.3	C	22.2	C
2	SR 303 and NE McWilliams Rd	Signalized	23.7	C	48.0	D	31.0	C	32.9	C
3	Alaskan Way and Yesler Way	Signalized[1]	3.0	A	6.6	A	5.4	A	5.2	A
4	Charleston Blvd and S Callow Ave	TWSC[2]	0.0	A	12.6	B	16.0	C	10.8	B
5	Burwell St and Warren Ave	Signalized	17.3	B	36.2	D	21.5	C	26.2	C
6	Burwell St and Pacific Ave	Signalized	4.8	A	6.5	A	7.6	A	5.6	A
7	SR 166 and Sidney Ave	Signalized	12.5	B	15.9	B	13.5	B	14.6	B
8	SW Barton St and Fauntleroy Way	TWSC[2]	8.7	A	27.7	D	22.0	C	17.9	C
9	Sam Christopherson Ave and SR 3 W	Signalized	17.1	B	154.3	**F**	83.5	**F**	40.7	D
10	Imperial Way and SR 3 W	Signalized	9.6	A	381.6	**F**	10.4	B	135.8	**F**
11	SE Spring Creek Rd and SE Mullenix Rd	TWSC[2]	8.8	A	68.2	**F**	19.5	C	21.7	C

Notes: **F** value denotes intersection LOS at unacceptable conditions.

[1] Highway Capacity Software 2000 results.

[2] The worst movement delay is reported for LOS.

Legend: Ave = Avenue; Blvd = Boulevard; ID = identification; LOS = Level of Service; NE = Northeast; NW = Northwest; Rd = Road; sec/veh = seconds per vehicle; SR = State Route; St = Street; SE = Southeast; SW = Southwest; TWSC = Two-way STOP-Controlled unsignalized intersection; W = West

On NAVBASE Kitsap-Bangor, approximately 10 individual round trips per week (or 2.5 round trips per day with a 4-day work schedule) are expected between NAVBASE Kitsap-Bangor and NAVBASE Kitsap-Bremerton. The round trips are assumed to occur during the transportation network's off-peak hours, which would further lessen the impact of these additional trips. Worker trips during peak periods would occur. These trips are not expected to have substantive impacts on roadway network levels of service.

Parking Impacts

It is estimated that 100-150 construction worker vehicles would park within the City of Bremerton and walk to NAVBASE Kitsap-Bremerton to work during the peak construction period. This could incrementally add to parking issues identified by the City of Bremerton.

Building demolition and replacement, described in Chapter 2 as an upland facility replacement, is not expected to generate much, if any, new parking demand. Temporary losses of on-installation parking could occur during some phases of construction at individual sites. Each construction project would need to address on-installation parking issues as part of construction management. The Navy will continue to coordinate with the City of Bremerton regarding the findings and recommendations of the Joint Compatibility Transportation Plan.

Effects Associated with Reasonably Foreseeable Future Actions

As described in Tables 3.12-2 and 3.12-3, RFFAs would generate some additional traffic associated with their construction but would be temporary, resulting in potential additive impacts to transportation within the ROI.

3.12.3.5 Impact Analysis for Alternative 3

Construction-related Impacts

Construction-related impacts for Alternative 3 are the same as those described Under Alternative 2 except with respect to parking.

Under Alternative 3, construction of M2D2 at the Mooring A location would require the Navy to modify or demolish facilities within the M2D2 footprint. This would include designated parking areas. To replace the lost parking spaces, a four-story, 400-space parking structure would be constructed in NAVBASE Kitsap-Bremerton.

Operation-related Impacts

Operation-related impacts for Alternative 3 are the same as those discussed in Section 3.12.3.4 for Alternative 2.

Table 3.12-11 provides the estimated baseline values (same as the values for Alternative 1) for each consideration and the estimated values for each consideration for each of the action alternatives evaluated in this EIS.

Effects Associated with Reasonably Foreseeable Future Actions

As described in Tables 3.12-2 and 3.12-3, RFFAs would generate some additional traffic associated with their construction but would be temporary, resulting in potential additive impacts to transportation within the ROI.

Table 3.12-11 Summary of Transportation Data by Alternative

Impact Consideration	*Alternative 1 (No Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
Construction worker trips	None	1,000 per peak	1,000 per peak
Construction hauling trips	None	25 to 50	25 to 50
Construction schedule (duration)	None	15 years, with maximum in first 3 years	15 years, with maximum in first 3 years
Percent increase to baseline traffic	None	Shift 1: • **a.m.:** 184.16% • **p.m.:** 7.39% Shift 2: • **a.m.:** 9.67% • **p.m.:** 9.68%	Shift 1: • **a.m.:** 184.16% • **p.m.:** 7.39% Shift 2: • **a.m.:** 9.67% • **p.m.:** 9.68%
Change in intersection or roadway LOS to unacceptable levels during construction	None	Two intersections decline to unacceptable LOS	Two intersections decline to unacceptable LOS
Operation worker trips	None	No change	No change
Operation schedule (duration)	None	No change	No change
Percent increase to baseline traffic during operation	None	No change	No change
Change in intersection or roadway LOS to unacceptable levels during operation	None	No change	No change

Legend: % = percent; LOS = level of service

3.12.3.6 Potential Mitigation for Traffic Congestion during Construction

Background

Construction traffic has the potential to temporarily change the LOS to unacceptable levels (traffic congestion/backup) at intersections for both Alternatives 2 (Preferred Alternative) and 3 (Table 3.11-12).

Deficiencies will be identified by LOSs. According to the transportation appendix of the City of Bremerton 2016 Comprehensive Plan, the City has a LOS standard of LOS E or better (acceptable LOS), except along routes that are a WSDOT Highway of Statewide Significance.

As shown in Table 3.12-12 and described below, the use of one off-site parking area near Bremerton Airport would cause unacceptable traffic levels at two intersections, SR 3 at Sam Christopherson Avenue and SR 3 at Imperial Way. An additional intersection at SE Spring Creek Road and SE Mullenix Road SE would degrade to LOS F, not because of forecasted construction traffic, but the projected background traffic growth. If the construction contractor procures additional or alternate off-site parking areas, traffic impacts would be potentially reduced and/or dispersed to other areas.

- **Shift 1 p.m.:** SR 3 at Sam Christopherson Avenue intersection (Int #9) at LOS F related to additional project trips on eastbound through movement.
- **Shift 1 p.m.:** SR 3 at Imperial Way intersection (Int #10) at LOS F related to additional project trips on eastbound left turn movement.
- **Shift 1 p.m.:** SE Spring Creek Road and SE Mullenix Road intersection (Int #11) at LOS F related to the projected background traffic growth (not due to the project).

- **Shift 2 a.m.:** SR 3 at Sam Christopherson Avenue intersection (Int #9) at LOS F related to additional project trips on northbound left turn and westbound through movements.
- **Shift 2 p.m.:** SR 3 at Imperial Way intersection (Int #10) at LOS F related to additional project trips on southbound movements.

Potential Mitigation

In 2021, a group of Kitsap and Mason County community partners known as the "Gorst Coalition" identified a series of projects to improve traffic congestion and provide for additional safety and resiliency improvements at the Gorst SR3/SR16 interchange area. Then in March 2022, as a part of the Washington State Legislature's "Move Ahead Washington" 16-year, $17 billion transportation funding package the Gorst SR3/SR16 interchange area was identified to receive up to $75 million for the initial planning, design, environmental and cultural resources work. In January 2024, WSDOT programmed $17 million to begin the Planning and Environmental Linkages (PEL) study, which will define the vision, goals, and develop an implementation report, through December 2025. It is anticipated, when complete, the constructed improvements would improve the deficient throughput at SR 3 and Sam Christopherson Avenue to an acceptable LOS during a portion of the construction timeframe of the Project.

As noted in Table 3-12.12, with recommended improvements listed below, these intersections anticipated to operate at unacceptable LOS can be improved to acceptable levels:

- The Navy would require the construction contractor to submit a Traffic Control Plan and Employee Parking Plan, subject to Navy review and approval. The plans would include measures to reduce impacts to an acceptable LOS, such as adjusting construction worker shift times and using flag men during shift changes.
- The Navy will coordinate the Traffic Control Plan with the City of Bremerton, Kitsap County, and WSDOT.

Table 3.12-12 Intersection Deficiencies and Improvements For Build (2030) Conditions

ID	Intersection	Control	Shift 1				Shift 2			
			a.m.		p.m.		a.m.		p.m.	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2030 Build without Improvement										
9	Sam Christopherson Ave and SR 3 W	Signalized[1]	17.1	B	154.3	**F**	83.5	**F**	40.7	D
10	Imperial Way and SR 3 W	Signalized[1]	9.6	A	381.6	**F**	10.4	B	135.8	**F**
2030 Build with Improvement										
9	Sam Christopherson Ave and SR 3 W	Signalized[1]	13.3	B	48.8	D	30.2	C	52.9	C
10	Imperial Way and SR 3 W	Signalized[1]	6.8	A	37.8	D	14.1	B	22.4	C

Notes: **F** value denotes intersection LOS at unacceptable conditions.

[1] Highway Capacity Software 2000 results.

Legend: Ave = Avenue; Blvd = Boulevard; ID = identification; LOS = Level of Service; sec/veh = seconds per vehicle; SR = State Route; TWSC = Two-way STOP-Controlled unsignalized intersection; W = West

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3.13 Marine Navigation

The marine navigation ROI includes the navigable maritime regions of the project study area. Maritime traffic includes U.S. Navy surface vessels and submarines, marine construction equipment, vessels, barges, ferries, recreational vessels, and fishing vessels. The portions of the Proposed Action occurring at NAVBASE Kitsap-Bangor would not generate marine traffic during construction or operation. Therefore, NAVBASE Kitsap-Bangor and Hood Canal are not discussed in this section.

3.13.1 Regulatory Setting

Table 3.13-1 provides a list of the existing regulatory environment applicable to marine navigation at NAVBASE Kitsap-Bremerton. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.13-1 Regulatory Setting for Marine Navigation

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
National Oceanic and Atmospheric Administration Navigational Information	U.S. Coast Pilot 10, Chapter 8
Vessel Traffic Management	33 CFR 161.1 through 161.23 and 161.55, chapter 2
Sinclair Inlet; Naval restricted areas	33 CFR 334.1240
Navigational Rules	33 CFR 83.18: (a) A power-driven vessel underway shall keep out of the way of: (iii) a vessel engaged in fishing

Legend: CFR = Code of Federal Regulations; U.S. = United States.

3.13.2 Affected Environment

The marine navigation ROI is depicted in Figure 3.13-1 and Figure 3.13-2, which include the navigable portions of Sinclair Inlet westerly of a line drawn from the Bremerton Ferry landing on the north shore of Sinclair Inlet and the Bremerton-Annapolis Ferry landing on the south shore of Sinclair Inlet. Within Sinclair Inlet, the black and yellow "Channel Limits" line shows the extent of deep waters (National Oceanic and Atmospheric Administration [NOAA] 2019). The ROI also includes the tug and barge route to the Open-Water Dredged Disposal Site in Elliott Bay, the Caisson Delivery Transit Route, and the route to the transload facility.

3.13.2.1 Existing Conditions

Vessel Transportation

There are several types of marine traffic within Sinclair Inlet, including Navy surface vessels and submarines, ferries, recreational vessels, and fishing vessels.

Existing Vessel Traffic

NAVBASE Kitsap-Bremerton is homeport to three submarines, one aircraft carrier, and security vessels. Other Navy vessels routinely arrive or depart for maintenance. Not all vessels undergoing maintenance at NAVBASE Kitsap-Bremerton are homeported vessels. Additionally, Sinclair Inlet is home to six marinas and three ferry piers, as well as boat ramps and popular fishing spots at shoreline locations. Navy operations typically consist of fewer than 50 vessel arrivals/departures per year. Additional movements within the harbor also occur. The Navy does not disclose vessel movements in advance.

NAVBASE Kitsap-Bremerton Port Operations schedules, controls, and conducts all movements. Port Operations Control Tower maintains communications guard on Marine Band. All activity on the waterfront is regulated under Puget Sound Naval Shipyard and Intermediate Maintenance Facility Instructions and Standard Operating Procedures. There are multiple port security gates to allow ingress and egress of the waterfront.

Rich Passage is located at the northeast end of Sinclair Inlet between Point White and Waterman Point where ships make turns to and from the wider portions of Puget Sound. Rich Passage is relatively shallow and has a strong current. As a result, large Navy craft, such as aircraft carriers and submarines, can only access Rich Passage twice per day at slack high tide (NAVBASE Kitsap-Bremerton Port Operations Interview 2021). Small craft, such as support tugs can operate without tidal restrictions. The only other connection between Puget Sound and Sinclair Inlet is Agate Passage, which is too shallow and constrained for large Navy vessel use. Small Navy boats and tugs may use Agate Passage when it is deemed safe and appropriate.

No specific vessel traffic counts are available for recreational or fishing vessels using Sinclair Inlet, but these have historically had the greatest level of conflict with Navy vessels due to their irregularity in terms of volume and travel paths, as opposed to the scheduled ferry services (detailed below). While specific counts cannot be obtained for recreational and fishing vessels, heavier recreational and fishing traffic is expected in Sinclair Inlet from July-September during summer and salmon fishing season.

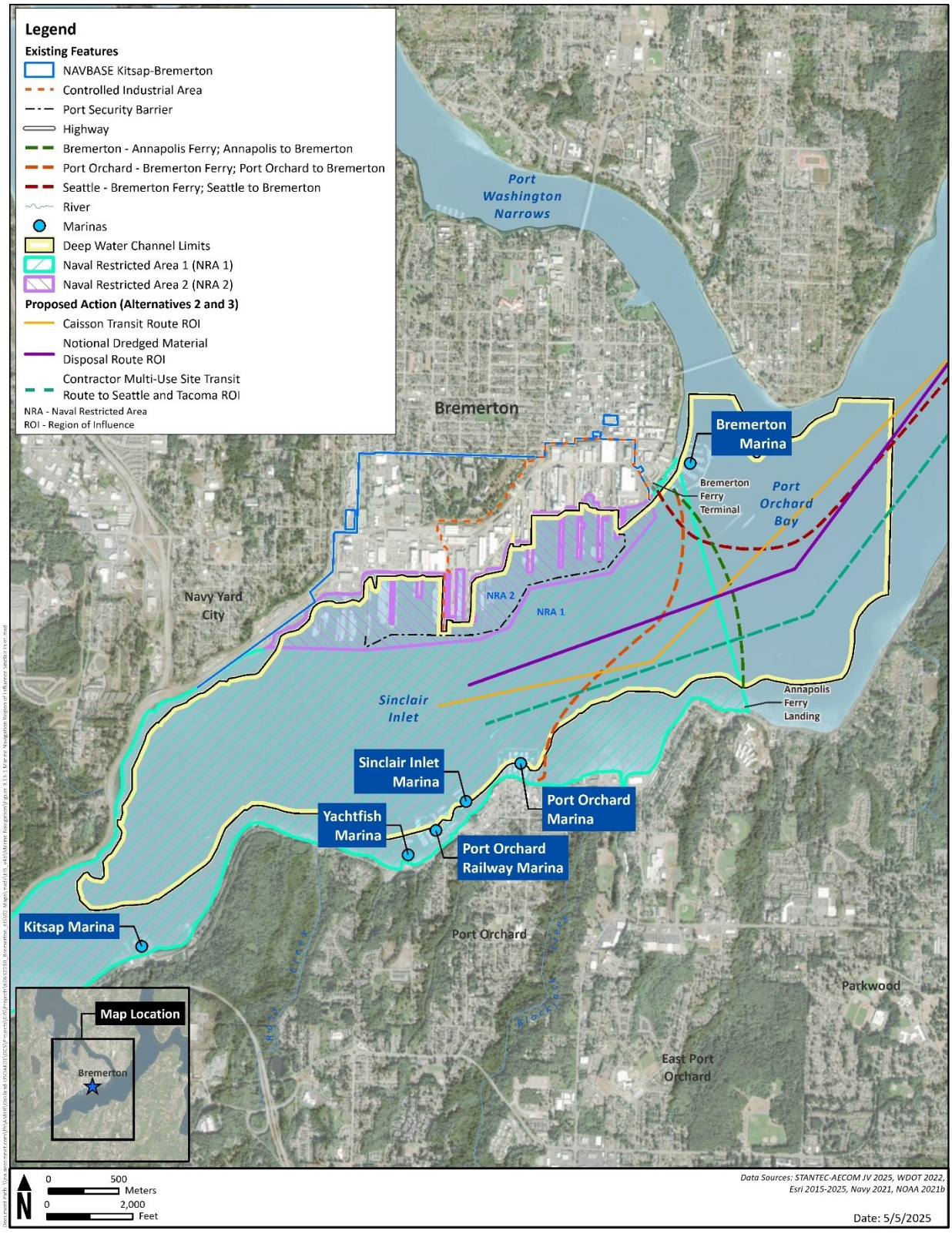

Figure 3.13-1 Marine Navigation Region of Influence – Sinclair Inlet

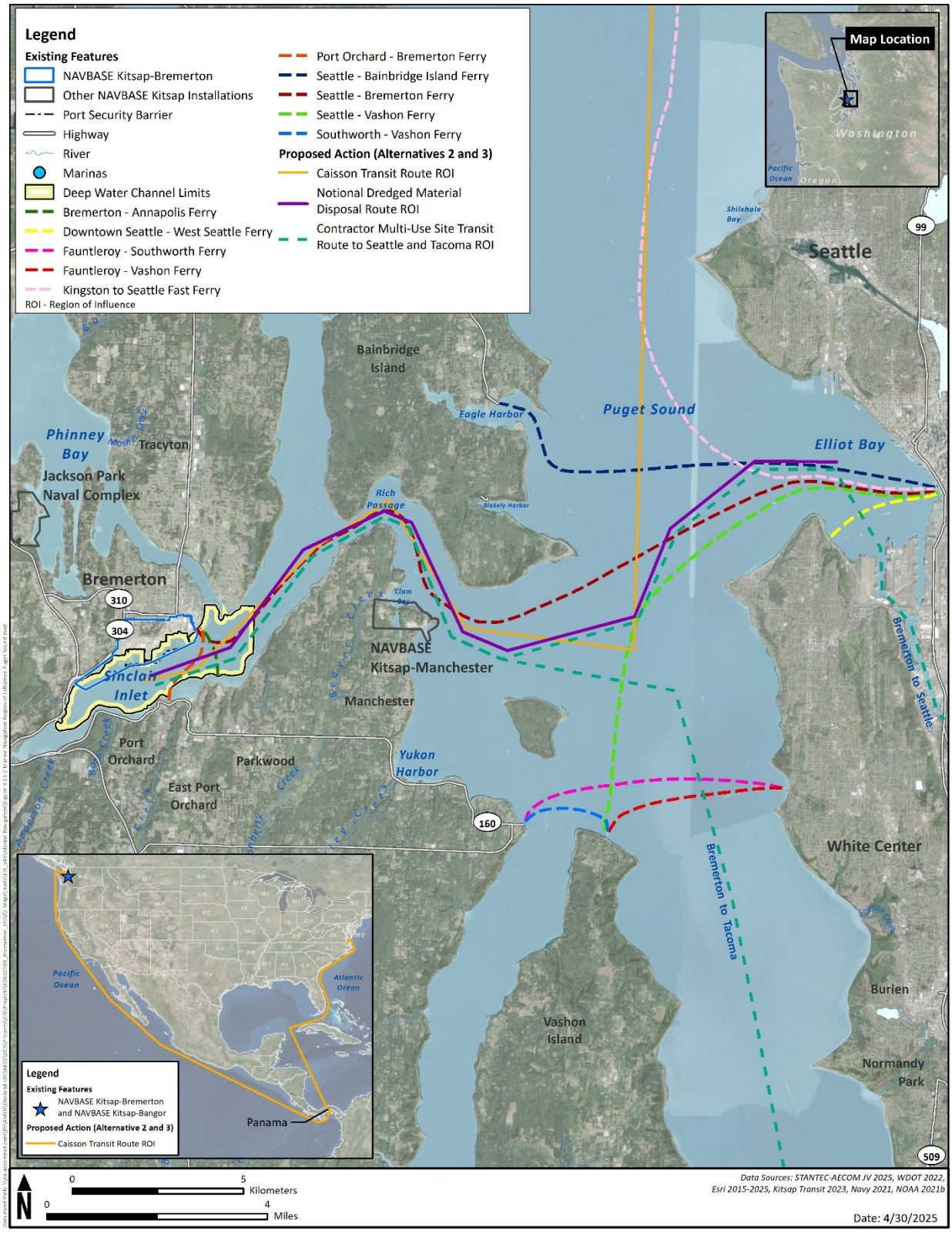

Figure 3.13-2 Marine Navigation Region of Influence – Puget Sound

Four ferry services operate out of Sinclair Inlet, all of which originate from the Bremerton Marina on the eastern edge of the NAVBASE Kitsap-Bremerton, just outside the Port water security barrier. They are:

- The Bremerton-Annapolis Ferry operated by Kitsap Transit. This weekday only passenger ferry service operates between the Bremerton Marina and Annapolis from 5:15 a.m. to 7:20 a.m. making nine morning round trips between each stop, and then again from 2:55 p.m. to 5:35 p.m. with an additional 11 round trips.
- The Bremerton-Port Orchard Ferry operated by Kitsap Transit. During weekdays, this passenger ferry service operates continuously making round trips between the Bremerton and Port Orchard Marinas from 4:25AM to 9:10PM. Each round trip is scheduled to take 30 minutes (15 minutes between each one-way transit between marinas). This amounts to 33 total round trips per weekday. This service also operates on Saturdays from 8:30 a.m. to 11:30 p.m., and on Sundays from 9:00 a.m. to 4:30 p.m., with the same 30 minutes per round trip as weekdays.
- The Seattle-Bremerton Fast Ferry Service operated by Kitsap Transit. Unlike the above two services, this ferry does not transit across the entrance area to Sinclair Inlet but leaves from Bremerton Marina to Seattle via Rich Passage. It operates on weekdays between 4:40 a.m. and 8:10 p.m., with 13 ferry arrivals and departures from Bremerton each day (e.g., 13 round trips, 26 one-way transits). The one-way transit to Seattle is scheduled to take 30 minutes. This service also operates on Saturdays from 9:20 a.m. to 10:50 p.m. with 10 ferries arrivals and departures from Bremerton on Saturdays.
- A separate Seattle-Bremerton ferry service operated by the Washington Department of Transportation, which operates daily between 6:50 a.m. and 11:50 p.m. Currently, one ferry serves this route, with eight arrivals and departures from Bremerton each day (8 round trips, 16 one-way transits); however, normally (i.e., prior to the Coronavirus Disease 2019 pandemic), two ferries were assigned to the route with twice as many arrivals and departures. As with the above Seattle service, this ferry does not need to transit across the entrance to Sinclair Inlet but does utilize Rich Passage.

Marine Exchange and Vessel Traffic Service in Puget Sound

The Marine Exchange of Puget Sound has a Vessel Monitoring/Vessel Reporting service that tracks the arrival of a vessel from a time prior to arrival at the Port Angeles pilot station to a berth at one of the Puget Sound ports. Constant updates of the ship's position and estimated time of arrival are maintained until the vessel passes the pilot station at Port Angeles on the outbound voyage. This system provides real-time information used to plan ship movements.

Regulated Navigation Areas

Navigable waterways near NAVBASE Kitsap-Bremerton are Naval restricted areas enforced by the Commander, Navy Region Northwest. Restriction Areas 1 and 2 are depicted in Figure 3.13-1. Exact latitudes and longitudes of the restricted areas are defined in 33 Code of Federal Regulations 334.1240 (U.S. Army Corps of Engineers [USACE] 2008).

Pilotage

Except for commissioned ships of the Navy, U.S. Coast Guard, and NOAA, a licensed ship pilot is compulsory for all vessels between Sinclair Inlet and the open sea. A further exception is those vessels under enrollment or engaged exclusively in the coasting trade. The coasting trade is trade between ports on the West Coast of the continental United States (including Alaska) and/or British Columbia.

Pilotage for Puget Sound is provided by the Puget Sound Pilots. Port Angeles has been designated as the pilotage station for all vessels enroute to or from the sea.

Navigation to/from Sinclair Inlet

Sinclair Inlet is entered from Rich Passage and Port Orchard on the east, and Port Washington Narrows on the north (NOAA 2020).

Navigational Hazards

Several unlighted mooring buoys, used at times by unlighted craft, are in Sinclair Inlet. Mariners are advised to exercise caution at night. There are several underwater cables in Sinclair Inlet, used for communications and data transfer. There is an active underwater cable area across the easterly entrance to Sinclair Inlet and an abandoned cable area along the westerly interior; both run approximately north–south across the inlet, and vessels should avoid anchoring in both areas (NOAA 2020).

Factors Affecting Vessel Safety

In addition to the navigational hazards described above, a variety of environmental conditions can affect vessel safety in Sinclair Inlet (Table 3.13-2).

Table 3.13-2 Environmental Factors Affecting Vessel Safety

Hazard	*Description*
Currents and Tides	The strong currents and large tidal fluctuations of Puget Sound are complex and variable; use of the tide prediction service available at https://tidesandcurrents.noaa.gov is advised. Past Point No Point, about 20 nautical miles from the entrance to Puget Sound, currents rarely exceed 2 knots (NOAA 2020), however, currents at other locations within Puget Sound can be much stronger depending on landform and bathymetry.
Winds and Storms	Winds are mainly from the southeast through southwest from September through April and northwest through north in late spring and summer. Typical average wind speeds are 7.0 to 8.4 knots. Intense storms can generate sustained winds of 40 knots with 50-knot gusts over the area. These strong winds are almost always from the south (NOAA 2020).
Visibility	Fog in the Puget Sound area causes visibility problems on 25 to 40 days each year. Primarily hindering navigation in autumn and again during January and February (NOAA 2020). Wildfires sometimes occur during the drier summer and fall months, leading to smoke which impedes visibility.
Water Depths	Waters are deepest at the easterly edge of Sinclair Inlet, with depths of 50–57 feet maximum. Depths reduce to 32–35 feet along the western edge of NAVBASE Kitsap-Bremerton (NOAA 2019).

Legend: NAVBASE = Naval Base; NOAA = National Oceanic and Atmospheric Administration

3.13.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Table 3.13-3 summarizes the potential effects to marine navigation associated with RFFAs at NAVBASE Kitsap-Bremerton with a close causal relationship to the project. None of the RFFAs at NAVBASE Kitsap-Bangor would have a close causal relationship with the project.

Table 3.13-3 Effects to Marine Navigation from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Pier 3 Electrical Substation Repair, PSNS & IMF	Within the ROI	None.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF, and NAVBASE Kitsap-Manchester	Within the ROI	If in-water work for this RFFA occurs simultaneously with in-water work for the project, there would be an impact on marine navigation, as construction and material transport crafts supporting both will need to be accommodated.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	Located at NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area but within the ROI.	None.
Navy – SIOP, PSNS & IMF	Within the ROI	If in-water work for this RFFA occurs simultaneously with in-water work for the project, there would be an impact on marine navigation, as construction and material transport crafts supporting both would need to be accommodated.
Navy – OU B Marine Source Removal Actions	Within the ROI	If in-water work for this RFFA occurs simultaneously with in-water work for the project, there would be an impact on marine navigation, as construction and material transport crafts supporting both will need to be accommodated.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area but within the ROI.	None.
Navy – NAVBASE Kitsap Bremerton Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	Within the ROI	None.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	Within the ROI	None.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	Within the ROI	None.

Legend: NAVBASE = Naval Base; Navy = United States Department of the Navy; OU = Operable Unit; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; RFFA = reasonably foreseeable future action; ROI = Region of Influence; SIOP = Shipyard Infrastructure Optimization Program

3.13.3 Environmental Consequences

The evaluation of marine navigation addresses potential delays to baseline marine traffic, changes to operating methods, and changes to Port Security Barrier (PSB) operating hours associated with the action alternatives and no-action alternative. The effects analysis evaluates the potential for beneficial or adverse impacts in consideration of BMPs presented in Table 3.13-4, with detailed descriptions of each BMP contained in Appendix A. The BMPs are measures that the Navy would implement to reduce the environmental impacts of designated activities, functions, or processes.

Table 3.13-4 Marine Navigation NAVBASE Kitsap-Bremerton Construction Best Management Practices

BMP	*Title*	*Applicability*
MARINE NAV MGMT BREM-1	Navy security operations protocols and security waterfront barrier operations would be adapted to manage additional vessel traffic during construction. Adaptations may include extending the security barrier hours to accommodate construction and dredging activity without impacting existing marine traffic. The security barrier would be relocated during the construction process to facilitate construction activities.	Construction
MARINE NAV MGMT BREM-2	The construction contractor will coordinate with NAVBASE Kitsap-Bremerton officials to address routine, unplanned (emergency or other), and construction-oriented vessel and submarine movements to minimize route and travel conflicts involving all vessel types and movements through Rich Passage.	Construction
MARINE NAV MGMT BREM-3	The construction contractor will coordinate with NAVBASE Kitsap-Bremerton officials to coordinate the staging of waterborne equipment and vessels such that, to the extent practicable, construction does not interfere with normal marine traffic flow in Sinclair Inlet.	Construction

Legend: BMP = best management practice; NAVBASE = Naval Base; Navy = United States Department of the Navy

3.13.3.1 Nature and Type of Effects

Typical effects due to a maritime construction activity include temporary restricted marine navigation access, delays to either Navy and non-Navy marine traffic, and alterations to existing PSB operations and protocols. Potential impacts of project-related vessel traffic on existing vessels using the ROI (including fishing vessels) are analyzed in this section and impacts on Tribal fishing are analyzed in Section 3.7.

3.13.3.2 Impact Assessment Methodology

Potential impacts to marine navigation were identified by evaluating the volume and frequency of existing marine traffic, where known, and through discussion of the operational requirements and guidelines with NAVBASE Kitsap-Bremerton staff. The Navy performed a desktop study using information gathered from historical data to evaluate requirements for safe navigation within Sinclair Inlet for surface vessels and submarines. Construction activities were evaluated to determine the extent to which they may increase marine traffic, and if so, to identify methods the Navy can use during construction to mitigate potential impacts on both Navy and non-Navy vessels traffic.

Construction activity will temporarily increase vessel traffic, including barges to move construction equipment and materials, and materials associated with excavation and dredging activities. Marine traffic associated with operations is not expected to substantially increase because overall mission and activity levels are not expected to increase after construction.

Movement of two new caissons will require a long vessel movement from the pre-fabrication site, which could be manufactured in Norfolk, Virginia. These vessel movements would involve travel through the Atlantic Ocean, Panama Canal, and the Pacific Ocean and then the Puget Sound via Rich Passage and Sinclair Inlet. There are no unusual marine navigation effects associated with these vessel movements.

3.13.3.3 Impact Analysis for Alternative 1: No-Action

Under Alternative 1, the Proposed Action would not proceed, and no impacts would occur to marine navigation. RFFAs involving construction activities (Table 3.13-3) could affect marine navigation through construction/deconstruction and material transport.

3.13.3.4 Impact Analysis for Alternative 2 (Preferred Alternative)

This section describes the impacts for Alternative 2 (Preferred Alternative).

Construction-related Impacts

Planned construction would add to the existing marine activity and traffic with increased number of vessels in and around the construction sites, particularly with the transport of equipment, material, and personnel by vessel. The estimated number and type of vessel transits are presented in Table 2-2.

During the construction period, volumes and types of non-construction marine traffic are expected to be similar to existing conditions.

Impacts beyond Sinclair Inlet and Rich Passage would be less frequent and more easily managed. These trips would include vessel movement between Elliott Bay and ports where construction equipment, machinery, parts, and personnel may originate or be destined. Trips to and from Elliott Bay would be associated with disposal of suitable dredged materials. The new caissons may be transported to NAVBASE Kitsap-Bremerton from Norfolk, Virginia requiring three separate, long, but generally routine trips in the Atlantic and Pacific Oceans via the Panama Canal or from another site where the caissons can be manufactured. No adverse marine navigation effects are anticipated from these operations during the construction period.

During the construction period, the Navy would need to implement certain measures in its construction plans and schedule to avoid or minimize the impact of project-related vessel activities on marine traffic, such that they do not hinder the movement of the other vessels (e.g., Navy vessels, submarines, ferries, fishing vessels, recreational vessels) within Sinclair Inlet. These measures are set forth as BMPs in Appendix A MARINE NAV MGMT-1, -2, -3. In summary, these BMPs address (1) adaptations to security operations protocols and security waterfront barrier operations, (2) coordination of vessel and submarine movements, and 3) coordination of staging of waterborne equipment and vessels.

Within Sinclair Inlet, conflicts with ferries have not historically been a concern since ferry schedules and transit times are well known and thus avoiding them is feasible. However, construction-related marine traffic may impact recreational and fishing vessels by reducing the available space for them to transit the inlet and synchronizing the timing of transits may not be feasible (e.g., a recreational vessel may need to alter course or wait for construction-related marine traffic to pass or clear the waterway before proceeding). Therefore, minimizing marine traffic impact on ferries by planning construction activities

around the ferries' transit schedule may be feasible because their schedule is generally consistent and predictable, whereas such a measure may be less practical for recreational and fishing vessels since their movements are unscheduled and unpredictable. The marine navigation BMPs would communicate the construction schedule to users (e.g., local marine and fishing communities) and include steps to clear the waterways of in-water construction activities as quickly as possible.

Aside from marine traffic levels in Sinclair Inlet during construction, traffic levels in Rich Passage, which provides access to Sinclair Inlet, must be addressed to avoid conflicts with existing marine traffic when bringing materials and equipment stored offsite into or out of the construction area via water transport. Existing traffic within Rich Passage includes Navy vessels and submarines. There are about 50 movements of these vessels per year, which can be easily scheduled to avoid conflicts. Additional traffic in Rich Passage includes the two Bremerton-Seattle ferry services; during peak service on weekdays, these amount to 21 ferry transits in each direction per day. Construction-related marine traffic would need to carefully schedule movements in Rich Passage to avoid conflicts, such as timing movements between ferry transits or scheduling movement of construction-related marine traffic in the overnight hours when ferries are not in service. Additionally, and less predictably, Rich Passage is used by recreational and Tribal fishing vessels to access marinas and fishing areas within Sinclair Inlet. Construction-related marine traffic would need to proceed carefully in this area. Implementation of the proposed BMPs during the construction phase of the project would avoid and reduce potential marine navigation conflicts and would reduce impacts and risks to negligible or minimal levels.

BMP MARINE NAV MGMT-1 presented in Appendix A would minimize marine traffic impacts by adapting security operations protocols and PSB operations to manage additional vessel traffic during construction.

Operation-related Impacts

Naval marine traffic volumes and operation of the PSB would return to pre-construction levels once construction is complete and there is no additional maintenance dredging under Alternative 2. Therefore, there are no expected impacts to existing marine traffic during operations.

Effects Associated with Reasonably Foreseeable Future Actions

When combined with RFFAs, there would be additive impacts to marine traffic and marine navigation within the ROI.

3.13.3.5 Impact Analysis for Alternative 3

Types of construction-related impacts to marine navigation under Alternative 3 would be consistent with those described for Alternative 2. The primary difference between Alternatives 2 and 3 is the degree of their potential impact and the dredging of a turning basin under Alternative 3.

Construction-related Impacts

Construction-related impacts to marine navigation under Alternative 3 would be greater than under Alternative 2. The total amount of construction material transported to the site and demolition material hauled away from the site is higher, requiring more vessel trips to support construction under Alternative 3.

Alternative 3 also involves the construction of a turning basin south of the M2D2 at Mooring A. This would obstruct a portion of Sinclair Inlet during construction of the basin. Impacts to recreational and Tribal fishing vessels are to be expected in terms of potentially slowing down or delaying transits to and

from marinas along the southern edge of Sinclair Inlet and to the far western side of the waterway. Dredge vessels may also block the drift of Tribal fishing nets. Additionally, the Kitsap Transit ferry service between Bremerton and Port Orchard operates a route just east of the proposed location for the turning basin. However, this ferry service should have a clear route of access to Port Orchard, bypassing the construction area. Construction in this area would need to be planned and scheduled carefully to avoid impacts to the Bremerton-Port Orchard Ferry.

Implementation of the proposed BMPs during the construction phase of the project would avoid and reduce potential marine navigation conflicts and would reduce impacts and risks to negligible or minimal levels.

Operation-related Impacts

Operation-related impacts under Alternative 3 are associated with dredging of the turning basin, located south of the M2D2 component at DD3. A Navy vessel would take up a large portion of the navigable waterway when the vessel is turning and thus reduce the navigable space for the other vessels in Sinclair Inlet. The main operation impact would be moving the location where Navy vessels can turn. Total frequency and duration of Navy vessel turning movements are expected to remain comparable to existing levels.

Effects Associated with Reasonably Foreseeable Future Actions

Anticipated effects from RFFAs would be the same as discussed under Alternative 2.

REFERENCES

NOAA. (2019). Navigation Chart 18449, 21st 35 Edition November 2019, Last correction: August 25, 2020.

NOAA. (2020). United States Coast Pilot 10, 2020 1st 36 Edition, Last Update: February 28, 2021.

NAVBASE Kitsap-Bremerton Port Operations Interview. (2021). Call Notes from April 14, 2021.

USACE. (2008). Code Title 33, section 334.1240 Sinclair Inlet; naval restricted areas. December 23.

3.14 Public Health and Safety

This discussion of public health and safety includes consideration for any activities, occurrences, or operations that have the potential to affect the safety, well-being, or health of members of the public. Public health and safety within this EIS discuss information pertaining to community emergency services (police, fire, emergency medical), construction activities, operations, and environmental health and safety risks to children.

Public health and safety during construction, demolition, and renovation activities is generally associated with construction traffic (land or marine), as well as the safety of personnel within or adjacent to the construction zones.

Operational safety may refer to the actual use of the facility or built-out proposed project and potential risks to inhabitants or users of adjacent or nearby lands and waters. Safety measures are often implemented through designated safety zones, warning areas, or other types of designations.

Executive Order 13045 defines the environmental health and safety risks to children as those that are attributable to products or substances a child is likely to encounter or ingest, such as air, food, water, soil, and products that children use or to which they are exposed (EPA 2022). Other exposures that are an environmental health and safety risk to children include, but are not limited to, emissions, noise,

light, traffic, and electromagnetic and other forms of radiation. Children have the potential to be more significantly impacted than adults because of their greater susceptibility to developmental impacts, which makes them more sensitive receptors.

3.14.1 Regulatory Setting

Table 3.14-1 provides a description of the existing regulatory environment for public health and safety at NAVBASE Kitsap-Bremerton. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.14-1 Regulatory Setting for Public Health and Safety

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)	42 U.S.C. sections 9601–9675; 40 CFR 300–311; 40 CFR 373
Resource Conservation and Recovery Act (RCRA)	42 U.S.C. sections 6901–6992k and 40 CFR 260-272 as it relates to hazardous waste management
Emergency Planning and Community Right-to-Know Act	42 U.S.C. Section 11001 et seq.; 40 CFR 350–372
Toxic Substances Control Act	15 U.S.C. Section 2601 et seq.; 40 CFR 700–723; 40 CFR 745–766; 40 CFR 790-799
Oil Pollution Act	33 U.S.C. Section 2701 et seq.
Pollution Prevention Act	42 U.S.C. sections 13101–13109
Federal Insecticide, Fungicide, and Rodenticide Act	7 U.S.C. Section 136 et seq.
Federal Environmental Pesticide Control Act	7 U.S.C. sections 136–136y
Federal Facilities Compliance Act	Public Law 102–386
Underground Storage Tank Regulations	40 CFR 280, 281, 282, and 283
Indoor Radon Abatement Act of 1988	Public Law 100-551
Clean Air Act	42 U.S.C. 7401 et seq.
Protection of Children from Environmental Health Risks and Safety Risks	Executive Order 13045
Noise Control Act of 1972	Public Law 92-574 and Amendments of 1978 Public Law 95-609
Federal Water Pollution Control Act or Clean Water Act	40 CFR sections 401 and 404; 33 U.S.C. 1251 et seq.
Rivers and Harbors Act	Section 10, 33 U.S.C. 401 et seq.
Department of Transportation laws and regulations, including the Transportation Safety Act	49 CFR 100–185
Hazardous Materials and Oil Transportation	49 CFR Subtitles A–C
Occupational Safety and Health Act	Public Law 91-596 84 STAT. 1590, December 29, 1970, as amended through January 1, 2004.
Danger Zone and Restricted Area Regulations	33 CFR 334
Final Military Munitions Rule	40 CFR Part 266, Subpart M
Explosives Safety Review, Oversight, and Verification of Munitions Responses	Naval Ordnance Safety and Security Activity Instruction 8020.15E.
National Industrial Security Program Operating Manual	DoD 5220.22-M
Fire and Emergency Services	DoD 6055.06
DoD Standard Practice, Safety Certification Program for Drydocking Facilities and Shipbuilding Ways for Navy Ships	MIL-STD-1625D(SH)
Navy Safety and Occupational Health Program Manual	OPNAVINST 5100.23G
Navy Physical Security and Law Enforcement Program	OPNAVINST 5530.14E
Navy Personnel Security Program	SECNAVINST 5510.30B

Law, Regulation, or Guidance	*Regulatory Citation*
Navy Information Security Program	SECNAVINST 5510.36B

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; DoD = Department of Defense; Navy = U.S. Department of the Navy; MIL-STD = Military Standard; OPNAVINST = Chief of Naval Operations Instruction; SECNAVINST = Secretary of the Navy Instruction; U.S.C. = United States Code

3.14.2 Affected Environment

In general, the ROI for the public health and safety analysis includes PSNS & IMF and NAVBASE Kitsap-Bremerton study area and adjacent communities (e.g., Bremerton and Port Orchard) (Figure 3.14-1) and parts of NAVBASE Kitsap-Bangor (Figure 3.14-2). Additionally, the ROI includes the transportation networks used for movement of materials and workers, where public health and safety could be affected by traffic, noise, and emissions. The ROI also includes residential areas where people are present at all times of the day and night, as well as areas where large groups of people may gather, such as commercial spaces and parks or other recreation areas (examples include the Bremerton Marina, Ferry Landing and Boardwalk, and Kiwanis Park). The ROI coincides with the geographic areas analyzed for Noise (Section 3.10) and Hazardous Materials (Section 3.15).

NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor are secure military installations, with access limited to military personnel, civilian employees, contractors, and military families. The public is allowed access for specific purposes (e.g. special events, media coverage, visitation) by following installation security procedures.

3.14.2.1 Existing Conditions

The existing conditions discussion covers public health and safety related topics that are relevant to the analysis of potential public health and safety impacts associated with the Proposed Action and its alternatives.

Air Quality

NAVBASE Kitsap-Bremerton

Air quality is addressed in public health and safety because poor air quality has long been linked to a variety of serious health problems and is especially dangerous for pregnant women, children, and the elderly. Kitsap County is generally considered to have good air quality and is in attainment for all criteria pollutants. NAVBASE Kitsap-Bremerton is regulated by the Puget Sound Clean Air Agency as two separate facilities (PSNS & IMF and NAVBASE Kitsap-Bremerton). PSNS & IMF operates under a Title V permit and NAVBASE Kitsap-Bremerton operates under a Synthetic Minor permit. A detailed description of the existing conditions for air quality can be found in Section 3.2 Air Quality.

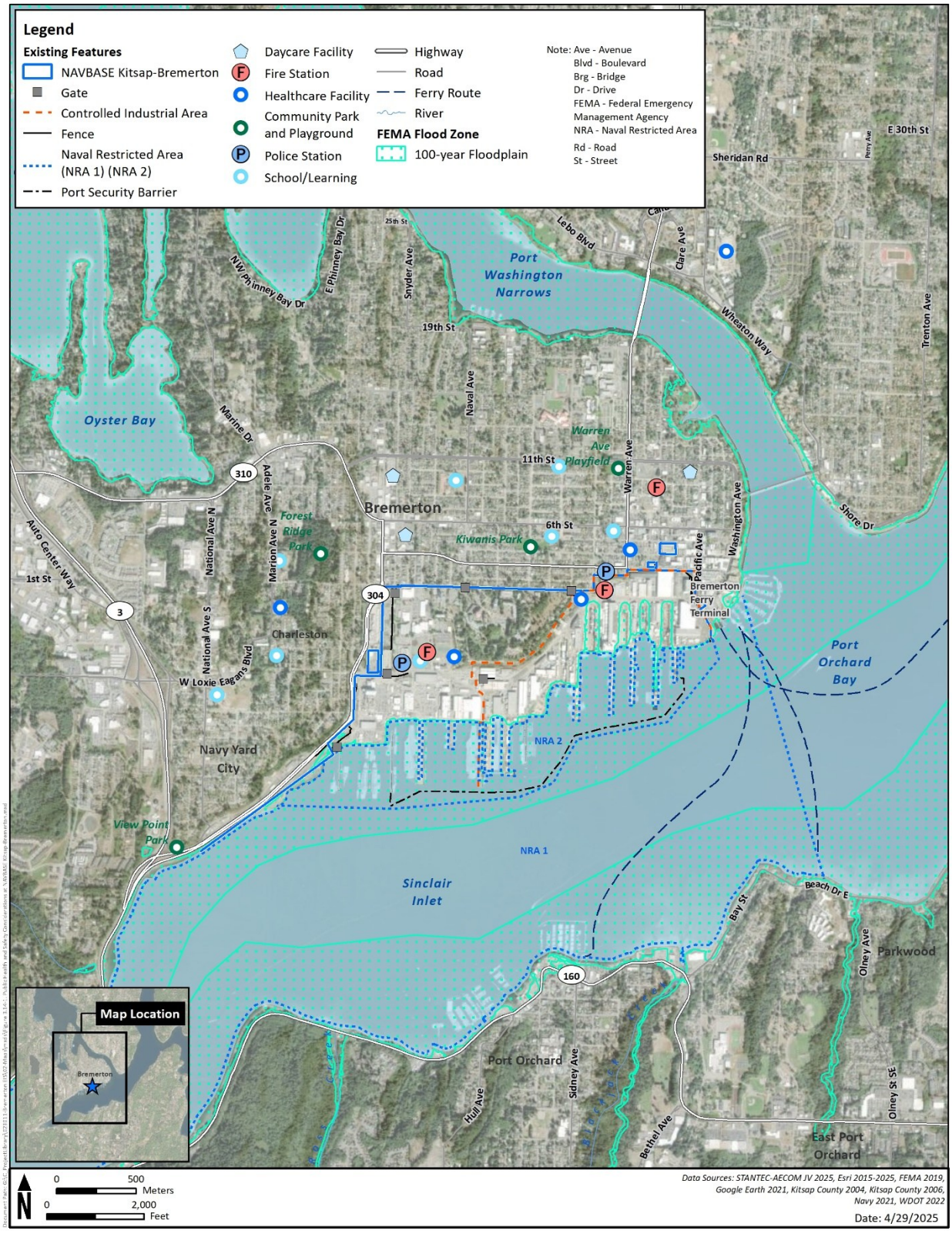

Figure 3.14-1 Public Health and Safety Considerations at NAVBASE Kitsap-Bremerton

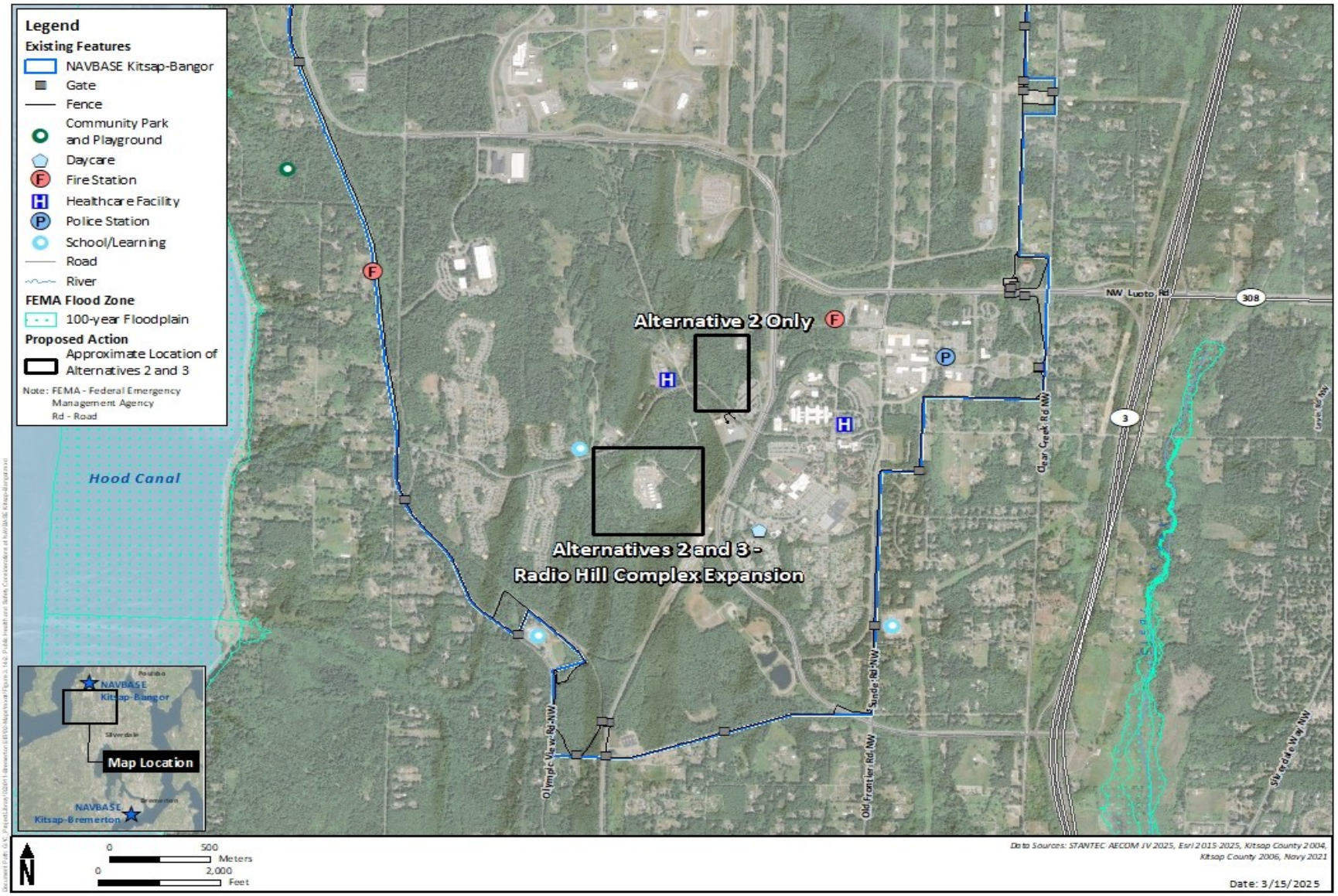

Figure 3.14-2 Public Health and Safety Considerations at NAVBASE Kitsap-Bangor

NAVBASE Kitsap-Bangor

As with NAVBASE Kitsap-Bremerton, Kitsap County is generally considered to have good air quality and is in attainment for all criteria pollutants. Also, like NAVBASE Kitsap-Bremerton, NAVBASE Kitsap-Bangor operates under a Synthetic Minor permit. A detailed description of the existing conditions for air quality can be found in Section 3.2 Air Quality.

Ambient Noise Levels

NAVBASE Kitsap-Bremerton

Noise is addressed in public health and safety because loud or sustained elevated noises can damage hearing and have impacts on human psychological and physical health. Activities at PSNS & IMF and NAVBASE Kitsap-Bremerton responsible for creating the existing noise environment include industrial activities, ship operations, and vehicle traffic. Additional ambient noise in the local area not derived from activities at NAVBASE Kitsap-Bremerton and PSNS & IMF includes vehicle traffic, marine traffic and ferry operations, and aircraft noise from overflights on approach to Bremerton National Airport. A detailed description of the existing conditions for noise can be found in Section 3.10 Noise.

Figure 3.10-1 depicts noise sensitive receptors in the ROI of NAVBASE Kitsap-Bremerton at greatest risk of impact due to their proximity to the project area. Noise sensitive receptors in the City of Bremerton include condominiums on Washington Beach Avenue (R01), single-family residences along Mahan Avenue (R02 and R03) and west of South Charleston Boulevard (R04 and R05), along with 2 healthcare facilities, 9 schools, and 12 places of worship. These areas comprise Bremerton's Downtown Subarea, District Center Core, and low-density residential areas, representing a range of commercial to residential urban land use.

Road traffic generates the largest source of noise in these environments, with industrial and commerce-related noises and waterway ferries playing a secondary role to noise sensitive receptors in the Downtown Subarea to the east. Navy Yard City, a census-designated dense suburban area, contains three representative residential receptors west of Navy Yard Highway, one school, and two places of worship where road and waterway traffic noise sources dominate. The City of Port Orchard contains two representative residential receptors (R09 and R10), which also serve as sensitive receptors for nearby healthcare, school, and places of worship. Road traffic and waterway ferry traffic in Sinclair Inlet contribute to the local noise environment. Aircraft overflights generate additional noise in the ROI due to the nearest airfield, Bremerton National Airport, located 5 miles to the southwest.

NAVBASE Kitsap-Bangor

Figure 3.10-2 depicts noise sensitive receptors in the ROI of NAVBASE Kitsap-Bangor at greatest risk of impact due to their proximity to the project area. Noise sensitive receptors in the vicinity of NAVBASE Kitsap-Bangor include a daycare, two healthcare facilities, and a school/learning facility. Each of these noise sensitive locations are within the NAVBASE Kitsap-Bangor property where existing noise exposure is typical of vehicular traffic and aircraft overflights.

Contaminants of Concern

NAVBASE Kitsap-Bremerton

Contaminants of concern (COCs) are chemicals for which a waste limit is established. COCs are evaluated in public health and safety because chemical wastes can have serious impacts on human health or the

environment. COCs are present in upland soil and marine sediment throughout the project area within PSNS & IMF Installation Restoration (IR) sites. These are sites that have been previously identified as having legacy contamination from past activities and have undergone or are in the process of undergoing remediation. Depending on the site, upland soil COCs may include PCBs, heavy metals, arsenic, PAHs, TCE, and pesticides. Terrestrial and marine IR sites in the project area are described in detail in Section 3.15 Hazardous Materials and Wastes and Table 3.15-2.

The Washington State Department of Health (WDOH) has issued an advisory cautioning against the consumption of certain types of fish, crabs, and prawns from Puget Sound and Sinclair Inlet (WDOH 2015, 2016). Specifically, the WDOH advises to limit or avoid consumption of salmon, flatfish (English sole, rock sole, and starry flounder), rockfish, crabs (Dungeness), and prawn from Puget Sound and Sinclair Inlet. The WDOH identified two contaminants in fish that are a potential health concern for people that eat certain types of fish: PCBs and mercury (methylmercury). PCBs, mercury, dichlorodiphenyltrichloroethane, polycyclic aromatic hydrocarbons, and polybrominated diphenyl ethers were detected in crab from Puget Sound areas but not at levels that impact health; however, guidance for eating crab roe/butter is more restrictive because contaminant concentrations are higher than in crab meat (WDOH 2016). Spot prawn can be safely eaten in Puget Sound with the notable exception of Sinclair Inlet. Even outside of Sinclair Inlet, elevated levels of PCBs, cadmium, and mercury are found in the heads of spot prawn, leading to more restrictive guidance for its consumption (WDOH 2016).

NAVBASE Kitsap-Bangor

COCs associated with OU 2 Site F were historically in the soil and groundwater northwest of the proposed forge shop at NAVBASE Kitsap-Bangor as a result of wastewater from military ordnance demilitarization dumped into an unlined lagoon and ditch between approximately 1960 and 1970. This area became a Superfund site and is designated as IR OU 2 Site F. Although the site has been remediated, land use controls (LUCs) remain at OU 2 Site F for legacy COC content in soil and groundwater.

Emergency Services

NAVBASE Kitsap-Bremerton

Emergency services are evaluated in public health and safety because they provide essential health and safety services to the community. Emergency services, including fire, health, and security, are provided by the trained military and civilian staff at NAVBASE Kitsap-Bremerton. The main hospitals offering emergency services near NAVBASE Kitsap-Bremerton are the Saint Michael Medical Center and Kaiser Permanente Medical Center in Silverdale. The Branch Medical Clinic is located at PSNS, east of DD4. NAVBASE Kitsap-Bremerton has a full-time staffed fire station and would receive assistance from local or state fire districts in the event of wildfire (Navy 2018c). Fire Station 28 is located at PSNS, between DD2 and DD4 on the north side of Farragut Avenue. The NAVBASE Kitsap-Bremerton Police Department is located at PSNS & IMF in Building 433 at 120 Dewey Street.

NAVBASE Kitsap-Bangor

Emergency services, including fire, health, and security, are provided by the trained military and civilian staff at NAVBASE Kitsap-Bangor. As with NAVBASE Kitsap-Bremerton, the main hospitals offering emergency services near NAVBASE Kitsap-Bangor are the Saint Michael Medical Center and Kaiser Permanente Medical Center in Silverdale. The Bangor Medical Clinic is located on Barb Street east of

Deterrent Park and northeast of the Bangor Fitness Complex. The NAVBASE Kitsap-Bangor Police Department is located at 1200 Skate Street.

Existing Light Pollution

NAVBASE Kitsap-Bremerton

Light pollution is evaluated in public health and safety because as with noise pollution, light pollution is a form of waste energy that can cause adverse health effects and degrade environmental quality. NAVBASE Kitsap-Bremerton is an active military installation and industrial facility. As such, exterior lighting is provided from dusk until dawn for safety and security throughout the facility.

NAVBASE Kitsap-Bangor

NAVBASE Kitsap-Bangor is an active military installation. As such, exterior lighting is provided from dusk until dawn for safety and security throughout the facility.

Marine Navigation

NAVBASE Kitsap-Bremerton

Marine navigation is addressed in public health and safety because marine navigation can affect marine and mariner safety. A detailed description of the existing conditions for marine traffic can be found in Section 3.13 Marine Navigation. To ensure the safety of life at sea, the U.S. Notice to Mariners provides timely marine safety information to mariners to correct or augment existing navigation charts and publications from a wide variety of sources.

NAVBASE Kitsap-Bangor

There is no marine navigation element associated with the proposed project at NAVBASE Kitsap-Bangor.

Munitions and Explosives of Concern

NAVBASE Kitsap-Bremerton

Munitions and explosives of concern (MEC) are evaluated in public health and safety because of the potential implications to safety if MEC are encountered. The upland and marine portions (including Sinclair Inlet) of the project area are considered to have low potential presence of MEC and/or material potentially presenting an explosive hazard and MEC is not anticipated in the dredge areas (USACE 2015, USACE 2021).

An explosive handling location, such as a magazine, transfer point, or operating building, will normally cast what is termed an explosives safety quantity distance (ESQD) arc. The ESQD arc size and shape depends on the function of the explosive handling location and the quantities/types of explosives permitted in the explosive handling location. ESQD arcs are protected from disclosure by federal statute, as disclosure may pose a risk to national security. According to a 2015 Joint Land Use Study (Kitsap County et al. 2015), NAVBASE Kitsap-Bremerton ESQD arcs do not extend over any inhabited areas. No portion of any communities neighboring NAVBASE Kitsap-Bremerton, including the City of Bremerton, is within any explosive arc.

NAVBASE Kitsap-Bangor

MEC were once present in an area adjacent to the location proposed for the new forge shop under Alternative 2 at NAVBASE Kitsap-Bangor. Military ordnance was demilitarized and wastewater from that process was dumped into an unlined lagoon and ditch between approximately 1960 and 1970. This area

is now IR OU 2 Site F. Although the site has been remediated and MECs are no longer present, LUCs remain at OU 2 Site F for legacy COC content in soil and groundwater.

Nuclear-powered Vessels

This section discusses public and occupational health and safety considerations related to radiation exposure from naval nuclear propulsion plants. In accordance with 50 U.S.C. part 2406, 2511 codifying Executive Order 12344, Naval Nuclear Propulsion Program (NNPP) is responsible for all aspects of the Navy's nuclear propulsion, including research, design, construction, testing, operation, maintenance, and ultimate disposition of naval nuclear propulsion plants. The NNPP responsibilities include radiological controls, environmental safety, and health matters (U.S. DOE and U.S. Navy, "The United States Naval Nuclear Propulsion Program," 2020). Nuclear-powered vessels are evaluated in public health and safety because of the potential implications of radioactive materials on safety. Procedures used by the NNNP to control releases of radioactivity have been effective in protecting the environment and the health and safety of the general public.

NAVBASE Kitsap-Bremerton

Nuclear-powered vessels are present at NAVBASE Kitsap-Bremerton within the project ROI.

NAVBASE Kitsap-Bangor

Although nuclear-powered vessels may be present at NAVBASE Kitsap-Bangor, they would be outside of the project ROI.

Occupational Health and Safety of Personnel

NAVBASE Kitsap-Bremerton

Occupational health and safety is evaluated in public health and safety because occupational health and safety programs play a key role in maintaining a safe and healthy workplace.

Navy personnel – Commander, Navy Installations Command (CNIC) has implemented the Enterprise Safety Application Management System (ESAMS), a safety management software program, at installations under its command for safety and occupational health data management of mishap reports, training, direct and indirect costs, medical surveillance, and hazard analysis. CNIC Fire and Emergency Services have also implemented ESAMS to manage their program. ESAMS provides a secure web-based means to manage all facets of the Navy's safety and health programs. ESAMS enables CNIC to fully comply with all current Occupational Safety and Health Administration (OSHA) regulations and CNIC's own occupational safety and health standards and provides real-time data for headquarters and command-level personnel, allowing them to make informed decisions based on current data and metrics (Command Navy Region Northwest 2021).

Contractor personnel – Construction and construction support personnel that have been contracted to perform work on the Proposed Action but who are not Navy employees are subject to health and safety requirements set forth by the contractor in compliance with applicable health and safety standards for conducting work at PSNS & IMF. Typical health and safety requirements for contractors might include, but are not limited to, a Site Health and Safety Workplan, Site Response and Evacuation Plan, BMP Plan, and demonstration of worker training, certification, and qualifications to perform the work requested.

NAVBASE Kitsap-Bangor

Occupational health and safety for both Navy and contractor personnel at NAVBASE Kitsap-Bangor would be the same as described above for NAVBASE Kitsap-Bremerton.

Traffic

NAVBASE Kitsap-Bremerton

Traffic is addressed in public health and safety because traffic management can affect vehicular and public safety. A detailed description of the existing conditions for vehicle traffic can be found in Section 3.12 Transportation. An increase in traffic could have an impact on traffic accidents and traffic-related injuries.

NAVBASE Kitsap-Bangor

As with NAVBASE Kitsap-Bremerton, Traffic (Transportation) is described in Section 3.12 Transportation and is included in in public health and safety because an increase in traffic could have an impact on traffic accidents and traffic-related injuries. In general, NAVBASE Kitsap-Bangor is far less congested and does not experience the same traffic issues within or nearby community as NAVBASE Kitsap-Bremerton.

Tsunami and Flood Zones

NAVBASE Kitsap-Bremerton

Tsunami and flood zones are addressed in public health and safety because the project occurs in a seismically active area that has experienced the impact of tsunamis in the past. Figure 3.3-3 illustrates the overlap of NAVBASE Kitsap-Bremerton and PSNS & IMF with FEMA-designated flood zones. Tsunami inundation areas have not been mapped by FEMA at Bremerton, NAVBASE Kitsap-Bremerton, or PSNS & IMF nor has tsunami hazard been fully evaluated in the City of Bremerton. However, tsunami-induced wave runup heights/elevations modeled for a variety of locally derived offshore scenarios suggest that the nearshore and eastern portion of NAVBASE Kitsap-Bremerton could be subject to tsunami inundation (American Society of Civil Engineers 2018).

NAVBASE Kitsap-Bangor

There are no floodplains in the NAVBASE Kitsap-Bangor project area (FEMA 2017c). The project area is located at elevations between approximately 300 feet (forge shop) and 400 feet (new Radio Hill Complex Expansion), and therefore outside of the tsunami inundation zone (Dolcimascolo et al. 2021; Kitsap County 2017b; USGS 2020).

Security and Anti-Terrorism/Force Protection

NAVBASE Kitsap-Bremerton

Security and ATFP is evaluated in public health and safety because military bases are identifiable targets for acts against safety and security. NAVBASE Kitsap-Bremerton is responsible for ensuring the security and safety of the installation. Force protection is accomplished through the planned and integrated application of law enforcement, anti-terrorism activities, training, physical security, and operations security in accordance with the January 2009 revised guidance for the Navy Physical Security and Law Enforcement Program (Navy 2009).

NAVBASE Kitsap-Bangor

Security and ATFP at NAVBASE Kitsap-Bangor would be the same as described above for NAVBASE Kitsap-Bremerton.

3.14.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Tables 3.14-2 and 3.14-3 summarize the potential effects to public health and safety associated with RFFAs with a close causal relationship to the project at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, respectively.

Table 3.14-2 Effects to Public Health and Safety from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Pier 3 Electrical Substation Repair, PSNS & IMF	RFFA located within PSNS & IMF	This RFFA could contribute to vehicle and vessel traffic; co-mingling construction contributions (air, noise, light); utility demand (e.g., electrical); and may require workspace occupation coordination.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF, and NAVBASE Kitsap-Manchester	RFFA located within PSNS & IMF	This RFFA could contribute to vehicle and vessel traffic; co-mingling construction contributions (air, noise, light); and may require workspace occupation coordination.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	This RFFA could contribute to vehicle and vessel traffic; co-mingling construction contributions (air, noise, light); and may require workspace occupation coordination.
Navy – SIOP, PSNS & IMF	RFFA located within PSNS & IMF	This RFFA could contribute to vehicle and vessel traffic; co-mingling construction contributions (air, noise, light); and may require workspace occupation coordination.
Navy – Operable Unit B Marine Source Removal Actions	RFFA located within PSNS & IMF	This RFFA could reduce the marine surface sediment contaminant concentrations through mercury source control actions, which has the potential to relax shellfish and other consumption advisories.
Navy –NAVBASE Kitsap-Manchester CERCLA actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	This RFFA could evaluate areas at risk of PFAS and delineate contaminations sites for future disposal efforts.
Navy – Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	RFFA located within PSNS & IMF	This RFFA could evaluate areas at risk of PFAS and delineate contaminations sites for future disposal efforts.
City of Bremerton – 6th Street Pavement Preservation Project Phase III	RFFA located outside PSNS & IMF	None.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	RFFA located outside PSNS & IMF	Although located outside of PSNS & IMF, it would have a beneficial impact on bicycle safety, and may improve access for bikes and pedestrians to NAVBASE Kitsap-Bremerton.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Port of Bremerton – Marina Breakwater Replacement, Port Orchard Marina	RFFA located outside PSNS & IMF	None
Private Development – The Beacon and Beacon II	RFFA located outside PSNS & IMF	None
Private Development – McWilliam Apartments	RFFA located outside PSNS & IMF	None

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; NSC = Naval Supply Center; PFAS = per and polyfluoroalkyl substances; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; RFFA = Reasonably Foreseeable Future Actions; SIOP = Shipyard Infrastructure Optimization Program

Table 3.14-3 Effects to Public Health and Safety from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Transit Protection Program Support Facilities	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	None.
Navy – Child Development Center	Located within NAVBASE Kitsap-Bangor Proposed ROI.	This RFFA would occur near the proposed laydown area and could contribute to health and safety impacts through the use of hazardous materials and output of hazardous wastes associated with demolition and construction activities during the period covered by this project action.
Navy – Military Working Dog Kennel Replacement	Located within NAVBASE Kitsap-Bangor Proposed ROI.	This RFFA would occur near the proposed forge shop location and could contribute to health and safety impacts through the use of hazardous materials and output of hazardous wastes associated with demolition and construction activities during the period covered by this project action.
Navy – Repair Substation 5	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	None.
Navy – Tang Road Repair	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	None.
Navy – Equipment Processing Building	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	None.
Navy – Relocate Flier Road	Located outside of NAVBASE Kitsap-Bangor Proposed ROI.	None.
Navy –CERCLA Action for PFAS	Located within the Radio Hill complex Proposed Action Area.	None
Navy – CERCLA Operable Unit 1 Site A	Located 4 miles north of Proposed Action Areas.	None
Navy – CERCLA Operable Unit 2 Site F	Located within the Proposed Action Area for the Forge Shop.	None

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Alternative Power Transmission Line	Located outside of NAVBASE Kitsap-Bangor Proposed ROI	None

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act, NAVBASE = Naval Base; Navy = U.S. Department of the Navy; ; PFAS = per and polyfluoroalkyl substances; RFFA = Reasonably Foreseeable Future Actions; ROI = Region of Influence; UXO = Unexploded Ordnance

3.14.3 Environmental Consequences

This section analyzes the potential impacts to public health and safety from implementation of the Proposed Action. The effects analysis evaluated the potential for beneficial or adverse impacts in consideration of BMPs listed in Tables 3.14-4 and 3.14-5.

3.14.3.1 Nature and Type of Effects

Potential effects to public health and safety from the action alternatives would include exposure to COCs; exposure to MEC; increased demand on emergency services; increased vessel and vehicle traffic and potential for traffic accidents; and increased air, noise, and light pollution.

3.14.3.2 Impact Assessment Methodology

The impact assessment methodology involved general literature searches and review of publicly available information from the Navy, State of Washington, County of Kitsap, City of Bremerton, and reports provided by the Navy. The intent of this research was to establish baseline conditions for public health and safety within the Proposed Action footprint. Analysis of the existing condition topics was performed in relation to the proposed project construction and operational activities by evaluating potential interaction of project actions with those topics' baseline conditions pertaining to public health and safety. The Navy performed data analysis using quantitative and qualitative methods, including analyses from other resources in this EIS, professional judgment, and trend analysis. The intent of the analysis was to document potential beneficial and/or adverse effects that may occur to public health and safety as a result of project construction and operational activities.

Generally, duration of impacts to public health and safety are defined as:

- Short-term: project activities that last less than 1 year.
- Long-term: project activities that last more than 1 year.
- Permanent: operational impacts and permanent changes to any resources that will not be restored when the project ends.

However, definitions may be more refined based on the impact discussed (e.g., air quality, noise).

Table 3.14-4 Public Health and Safety Best Management Practices at NAVBASE Kitsap-Bremerton

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
PH&S MGMT BREM-1	Impacts to public health and safety	A construction safety plan shall be developed by contractors for its on-site construction personnel to follow that includes evacuation procedures in the event of a tsunami warning.	Construction
PH&S MGMT BREM-2	Impacts to public health and safety	All applicable federal and state regulations for demolition and construction shall be implemented, including construction safety BMPs and preparation of a construction site safety plan.	Construction
PH&S MGMT BREM-3	Impacts to public health and safety	All relevant construction activities shall implement response actions prescribed for Munitions Response.	Construction

Legend: BMP = Best Management Practices; MGMT = Management; PH&S = Public Health and Safety

Table 3.14-5 Public Health and Safety Best Management Practices at NAVBASE Kitsap-Bangor

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
PH&S MGMT BANGOR-1	Impacts to public health and safety	A construction safety plan shall be developed by contractors for its on-site construction personnel to follow that includes evacuation procedures in the event of a tsunami warning.	Construction
PH&S MGMT BANGOR-2	Impacts to public health and safety	All applicable federal and state regulations for demolition and construction shall be implemented, including construction safety BMPs and preparation of a construction site safety plan.	Construction
PH&S MGMT BANGOR-3	Impacts to public health and safety	All relevant construction activities shall implement response actions prescribed for Munitions Response.	Construction

Legend: BMP = Best Management Practices; MGMT = Management; PH&S = Public Health and Safety

3.14.3.3 Impact Analysis for Alternative 1: No-Action

Under Alternative 1, the Proposed Action would not proceed. Without upgrades to meet current seismic standards, most of the dry docks, piers, and wharves at PSNS & IMF are expected to perform poorly in seismic events, as described in Section 1.4.2. If a CVN were in the dock at the time of a very large seismic event, it could suffer damage and the daily work force participating in dry dock activities would be at risk of serious injury or death.

RFFA influence on public health and safety would still occur as described in Tables 3.14-2 and 3.14-3, respectively.

3.14.3.4 Impact Analysis for Alternative 2 (Preferred Alternative)

Construction-related impacts under Alternative 2 would result in localized effects to public health and safety.

Construction-related Impacts

Under Alternative 2, construction, demolition, and dredging activities as described in Section 2.3.2 would occur at NAVBASE Kitsap-Bremerton. Additionally, construction of the new forage shop, access road, and an expansion of existing mission support area (Radio Hill complex) at NAVBASE Kitsap-Bangor would occur. Table 3.14-6 summarizes construction-related impacts anticipated under Alternative 2.

Alternative 2 would result in localized effects to public health and safety for the duration of construction activities at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.

Table 3.14-6 Construction-related Impacts Under Alternative 2

Public Health and Safety Topic	*Description of Potential Impacts*
Air Quality	Emissions result primarily from the operation of engines burning fossil fuels, fugitive dust generated by on-site trucks transporting materials around the worksite, batch plant operations that would occur between 2029 and 2032, and construction equipment operations. Ground level emissions are anticipated to be quickly entrained downwind with potential impacts similar to vehicle emissions along a highway, where concern would be focused on sensitive receptors immediately adjacent to the emission sources. Application of BMPs AQ-1 through AQ-5 would further reduce emissions and reduce pollutant concentrations at any given location. Air quality impacts would also be minimized to the extent practicable through mitigation measures, where necessary or required by permit conditions, developed in coordination with EPA and Ecology to conform with the NAAQS. Therefore, emissions under Alternative 2 would be minimal and are not expected to interfere with the attainment status of NAAQS or appreciably increase human health risks from HAP exposure in areas where sensitive receptors and/or public presence are expected. As such, impacts to public health and safety are not anticipated to result from construction-related air quality conditions.
Ambient Noise Levels	Noise would be created during demolition and construction of new facilities; from in-water work such as dredging and pile driving; and from marine traffic required for transportation of materials, equipment, and construction workers. The locations most likely to notice the additional noise from dredging would be R01 along the city of Bremerton's eastern shoreline; R08 and R09 residential areas in the northern part of Port Orchard; and R05, R06, and R07 in Navy Yard City adjacent to NAVBASE Kitsap-Bremerton due to their proximity. The greatest source of noise from in-water construction would be pile driving that would generate elevated noise levels potentially affecting some noise sensitive locations, as detailed specifically for Alternatives 2 and 3 analysis. All construction noise would be short term and would not affect

Public Health and Safety Topic	***Description of Potential Impacts***
	the long-term noise environment. Additionally, pile driving would not occur before 7 a.m. or after 9 p.m. However, pile driving noise levels would be substantially greater than the existing noise at some noise sensitive locations, lasting weeks to months. Upland work within Alternative 2 would comprise clearing and grading and construction materials laydown and staging, all requiring construction equipment operation such as forklifts, bulldozers, and dump trucks. Noise sensitive locations are sufficiently far from this proposed upland work so none would be affected. Therefore, impacts to public health and safety are not anticipated to result from construction-related noise.
COCs	Construction actions could result in the disturbance of media (e.g., water, soil, human-made materials) containing contaminants, such as IR sites associated with either the PSNS Complex or NAVBASE Kitsap-Bangor Superfund sites. The PSNS Complex Superfund Site OUs within the ROI are OU A, OU B Marine, OU B Terrestrial, and OU Naval Supply Center. The NAVBASE Kitsap-Bangor Superfund Site OU within the ROI is OU 2 Site F. These IR sites and OUs are described further in Section 3.15 Hazardous Materials and Waste of this EIS. Construction activities would comply with, as applicable for each individual site, the respective CERCLA ROD management plans, RCRA requirements for hazardous waste tracking and disposal, the *Puget Sound Naval Shipyard and Intermediate Maintenance Facility Hazardous Waste Management Plan* (DoN 2020), associated permitting requirements, and BMPs (see Tables 3.14-4 and 3.14-5) to minimize potential impacts of COCs to public health and safety. Construction would minimize potential risks to human health and the environment through the proper management of soils, sediment, groundwater, stormwater, construction materials, and project waste. It is anticipated that dredging associated with waterfront infrastructure improvements at NAVBASE Kitsap-Bremerton will generate both dredged material suitable for open water disposal (clean material) and dredged material unsuitable for open water disposal (contaminated material). Of the total dredging volume, both alternatives would involve the removal of substantial volumes (at least the top 4 feet) of dredged material not suitable for open water disposal, which removes that volume of sediment containing COCs from the benthic environment. The upland and marine portions (including Sinclair Inlet) of the project area are considered to have low potential for the presence of MEC and/or material potentially presenting an explosive hazard, and MEC is not anticipated in the dredge areas (USACE 2015, 2021). Therefore, the potential for impact from MEC is low, and the benefit from the removal of COCs in the sediment is high. Consequently, impacts to public health and safety are not anticipated to result from construction-related COCs.
Emergency Services	A short-term, minimal increase of demand for emergency services may result from the addition of construction workers at PSNS & IMF. It is assumed that construction activity has the potential to result in an increase in injuries from workplace accidents and, therefore, could increase demand on emergency services resulting in slower response times for the general public. However, the added demand would be small and not exceed the existing service capacity. Compliance with OSHA regulations would minimize the potential for workplace accidents, and project design will incorporate all applicable federal, state, DoD, and Navy safety standards and requirements. Therefore, impacts to public health and safety are not anticipated to result from construction-related demand on emergency services.
Light Pollution	PSNS & IMF is an active shipyard with ongoing operations 24 hours per day, 7 days per week, and 365 days per year. It is always fully illuminated. Additional construction illumination would be necessary during periods of darkness and would require supplementary lighting. Outdoor lighting increases the safety of workers. Night lighting associated with construction activity may temporarily increase the level of nighttime light; however, the change would be minimal with

Public Health and Safety Topic	***Description of Potential Impacts***
	the implementation of BMPs (VIS MGMT BREM-1) and because PSNS & IMF is already well lit at night. Therefore, negative impacts are not anticipated from construction activities.
Nuclear-Powered Vessels	NNPP requirements ensure that civilian and military personnel do not exceed NNPP radiation exposure limits. These limits are consistent with other federal radiation exposure limits, including EPA, DOE, and Nuclear Regulatory Commission radiation exposure limits. No civilian or military NNPP personnel have ever (in over 60 years of operation) exceeded any federal lifetime limit (NNSA, Naval Nuclear Propulsion Program report NT-24-2, "Occupational Radiation Exposure from U.S. Naval Nuclear Propulsion Plants and Their Support Facilities," dated May 2024). In addition, NNPP policies for management of radioactive liquid, transportation and disposal of solids wastes are protective of human health and the environment. NNPP monitors the environment regularly. Radioactivity associated with U.S. naval nuclear-powered ships has had no discernible effect on the quality of the environment (NNSA, Naval Nuclear Propulsion Program Report NT-24-1, "Environmental Monitoring and Disposal of Radioactive Wastes from U.S. Naval Nuclear-Powered Ships and Their Support Facilities," dated May 2024). The Navy will comply with all NNPP requirements to ensure public health and safety during construction of the Proposed Action at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.
Traffic	Construction workers would not have access to parking on-site and would need to park in off-site parking lots or 'park and rides' and take a foot ferry to reach the work site. Consequently, construction would not appreciably increase traffic within the city of Bremerton. Additionally, there are no construction-related impacts to passenger vehicles, active transportation (pedestrian and bicycles), transit, and freight networks forecasted at NAVBASE Kitsap-Bremerton or at the park and ride or ferry sites. Therefore, impacts to public health and safety are not anticipated to result from construction-related traffic.
Tsunami and Flood Zones	No net change to public health and safety due to existing tsunami, and flood zones within the proposed footprint would occur during construction. The project would not result in floodplain filling that would exacerbate flooding and property damage potential in the vicinity of the project area. Stormwater would be managed to have no net increase in runoff that could contribute to localized flooding (see Section 3.3). Evacuation plans would be developed in the event of a tsunami warning (BMP PH&S MGMT BREM-1).

Legend: AQ = air quality; BMP = best management practice; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; COC = contaminant of concern; DoD = Department of Defense; DOE = Department of Energy; DON = Department of the Navy; EIS = Environmental Impact Statement; EPA = U.S. Environmental Protection Agency; HAP = hazardous air pollutant; IR = Installation Restoration; MEC = munitions and explosives of concern; NAAQS = National Ambient Air Quality Standards; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; NNPP = Naval Nuclear Propulsion Program; NNSA = National Nuclear Security Administration; OSHA = Occupational Safety and Health Administration; OU = operable unit; PH&S = Public Health and Safety; PSNS = Puget Sound Naval Shipyard; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; R[##] = representative residential receptor [designation]; RCRA = Resource Conservation and Recovery Act; ROD = Record of Decision; ROI = Region of Influence; U.S. = United States; USACE = U.S. Army Corps of Engineers

Operation-related Impacts

Operation-related impacts of Alternative 2 on public health and safety would be generally similar to the impacts currently occurring at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, such as light pollution, nuclear-powered vessels, traffic, and tsunami, and flood zones. However, impacts from air quality, ambient noise levels, and COCs may be higher near the east end of PSNS & IMF under

Alternative 2 due to an increase of additional vehicle trips between NAVBASE Kitsap-Bangor and NAVBASE Kitsap-Bremerton, exposing personnel to additional traffic-related risks. However, the minor increase in vehicle trips would not result in substantive roadway capacity or public health and safety impacts. Table 3.14-7 summarizes operation-related impacts under Alternative 2.

Alternative 2 would result in effects to public health and safety under similar conditions currently experienced during operational activities at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.

Table 3.14-7 Operation-related Impacts Under Alternative 2

Public Health and Safety Topic	*Description of Potential Impacts*
Air Quality	Emissions generated from operations would occur from permitted and exempt (insignificant activity) stationary source equipment located at PSNS & IMF. Permitted stationary source equipment is largely from source types that would be relocated from existing to the new and adjacent facilities. Any new activities regulated under the Shipbuilding and Ship Repair NESHAP would be evaluated for inclusion in the PSNS & IMF air permit. Exempt stationary source equipment are mainly standby generators used only during power outages. Standby generator power for the pumphouses would be provided by emergency diesel generator units. Emissions from these generators would be intermittent. Commuter emissions are expected to be similar to existing conditions. Anticipated air quality impacts from operational activities for all action alternatives are not expected to interfere with the attainment of NAAQS or appreciably increase human health risks from HAP exposure in areas where sensitive receptors and/or public presence are expected. Therefore, impacts to public health and safety are not anticipated to result from operations-air quality conditions.
Ambient Noise Levels	The Navy does not anticipate the frequency or magnitude of the noises would change based upon the proposed alternatives so there would be no change to the noise environment for ongoing operations and no sensitive receptors would be affected. Therefore, impacts to public health and safety are not anticipated to result from operations-related noise.
COCs	The Navy would implement BMPs to minimize potential disturbance from propeller scour (WATER MGMT BREM-24). COCs post construction would meet sediment quality standards. Therefore, no impacts to public health and safety are anticipated from COCs as a result of project operations.
Emergency Services	The operational workforce would remain close to current levels at PSNS & IMF. Therefore, significant impacts to public health and safety are not anticipated to result from operations-related demand on emergency services.
Light Pollution	During the operational phase, facility lighting would be required during periods of darkness. Adverse effects from night lighting could occur if there is spill-over to adjacent residential areas. However, PSNS & IMF is an active shipyard with ongoing operations 24 hours per day, 7 days per week, and 365 days per year. It is always fully illuminated. Moreover, outdoor lighting increases the safety of workers. Upon completion of the construction phase, illumination would be similar to pre-project conditions, and light scatter would be reduced through designs such as directional/focused lighting and other BMPs to minimize potential light scatter to surrounding receptors, including residential areas (VIS MGMT BREM-1). Therefore, no negative impacts are anticipated to result from operations-related illumination.

Public Health and Safety Topic	*Description of Potential Impacts*
Nuclear-Powered Vessels	NNPP requirements ensure that civilian and military personnel do not exceed NNPP radiation exposure limits. These limits are consistent with other federal radiation exposure limits, including EPA, DOE, and Nuclear Regulatory Commission radiation exposure limits. No civilian or military NNPP personnel have ever (in over 60 years of operation) exceeded any federal lifetime limit (NNSA, Naval Nuclear Propulsion Program report NT-24-2 "Occupational Radiation Exposure from U.S. Naval Nuclear Propulsion Plants and Their Support Facilities," dated May 2024). In addition, NNPP policies for management of radioactive liquid, transportation and disposal of solids wastes are protective of human health and the environment. NNPP monitors the environment regularly. Radioactivity associated with U.S. naval nuclear-powered ships has had no discernible effect on the quality of the environment (NNSA, Naval Nuclear Propulsion Program Report NT-24-1, "Environmental Monitoring and Disposal of Radioactive Wastes from U.S. Naval Nuclear-Powered Ships and Their Support Facilities," dated May 2024). The Navy will comply with all NNPP requirements to ensure public health and safety during construction of the Proposed Action at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.
Traffic	Following construction, both the NAVBASE Kitsap-Bremerton and the CIA are anticipated to operate at pre-construction population and employment levels. No operation-related impacts to passenger vehicles, active transportation (pedestrian and bicycles), transit, and freight networks are expected. Potential impacts would be further minimized through implementation of BMPs (see Table 3.14-4, TRAFFIC MGMT-1). Therefore, impacts to public health and safety are not anticipated to result from operations-related traffic.
Tsunami and Flood Zones	Parts of PSNS & IMF are located within a tsunami inundation area, where destructive waves caused by extreme tsunamis could inundate some portions of the project area during operation. The project will not change the existing tsunami hazard areas. The project has been designed to accommodate potential future sea level rise and offset the difference. The project would not result in floodplain filling that would exacerbate flooding and property damage potential in the vicinity of the project area. Stormwater would be managed to have no net increase in runoff that could contribute to localized flooding (see Section 3.3). Evacuation plans would follow existing tsunami evacuation plans for PSNS & IMF. Therefore, no net change to public health and safety due to existing tsunami and flood zones are anticipated as a result of project operations.

Legend: BMP = best management practice; CIA = Controlled Industrial Area; COC = contaminant of concern; DOE = Department of Energy; EPA = U.S. Environmental Protection Agency; HAP = hazardous air pollutant; NAAQS = National Ambient Air Quality Standards; Navy = U.S. Department of the Navy; NESHAP = National Emission Standards for Hazardous Air Pollutants; NNPP = Naval Nuclear Propulsion Program; NNSA = National Nuclear Security Administration; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility

Effects Associated with Reasonably Foreseeable Future Actions

Under Alternative 2, RFFA influence on public health and safety would still occur as described in Tables 3.14-2 and 3.14-3. However, under Alternative 2, new infrastructure designed to address sea levels and storm surge in accordance with OPNAV M-5090.1 would replace old infrastructure that is at greater risk. Depending on when they occur, one or more of the RFFAs described in Tables 3.14-2 and 3.14-3 could overlap with vehicle and vessel traffic, co-mingling construction contributions to potential impacts on air quality, noise, light, and emergency services.

3.14.3.5 Impact Analysis for Alternative 3

Impacts under Alternative 3 would be consistent with those described under Alternative 2 (see Section 3.14.3.4), specific differences between the two are discussed below.

Construction-related Impacts

Construction-related impacts of Alternative 3 on public health and safety would be similar to the described impacts under Alternative 2 (see Table 3.14-6).

Under Alternative 3, construction and demolition activities, in particular those that would occur at the location of existing Mooring A (instead of DD3), would be farther to the west than activities associated with Alternative 2, and farther from sensitive receptors such as downtown Bremerton, Bremerton Waterfront District and Harborside Fountain Park, and residences north of 1st Street. Therefore, these areas may experience less noise than construction of Alternative 2. However, pile driving noise levels would be greater than the existing noise at noise sensitive locations. Noise-related BMPs would be implemented to reduce the potential for noise impacts (Section 3.10). Therefore, Alternative 3 would result in localized effects to public health and safety associated with ambient noise for the duration of construction activities at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.

Operation-related Impacts

Operation-related impacts of Alternative 3 on public health and safety would be similar to those described under Alternative 2 (see Table 3.14-7). Therefore, Alternative 3 would result in effects to public health and safety under similar conditions currently experienced during operational activities at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.

Effects Associated with Reasonably Foreseeable Future Actions

Effects to public health and safety from reasonably foreseeable future actions under Alternative 3 would be the same as under Alternative 2.

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3.15 Hazardous Materials and Wastes

This section discusses hazardous materials, hazardous wastes, toxic substances, and contaminated sites, and analyzes potential environmental impacts from construction and operation of the Proposed Action.

3.15.1 Regulatory Setting

Table 3.15-1 provides a description of the existing regulatory environment for Hazardous Materials and Wastes at NAVBASE Kitsap-Bremerton, Washington. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.15-1 Regulatory Setting for Hazardous Materials and Wastes

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
Resource Conservation and Recovery Act	42 U.S.C. section 6901 et seq.
Comprehensive Environmental Response, Compensation, and Liability Act	42 U.S.C. section 9601 et seq.; 40 CFR 302.4
Clean Water Act	33 U.S.C. sections 1313, 1314 Most Recent 304(a) list
Rivers and Harbors Act	40 CFR 116.4, sections 307, 311, 401, 404
Toxic Substances Control Act	15 U.S.C. section 2601 et seq.; 761.60-761.79; 761.180-761.185; sections 402, 403, 405, and 406;
National Emission Standards for Hazardous Air Pollutants	Title 40, Chapter I, Subchapter C, Part 61, Subpart M
Protection of the Environment.	40 CFR et seq
Emergency Planning and Community Right-To-Know Act	42 U.S.C. Section 11001 et seq.; 40 CFR 350–372
Clean Water Act	Sections 401, 402, 404, 33 U.S.C. section 1341, 40 CFR section 121.2(a)(3), (4), and (5) Water Quality Certification
Applicability of Hazardous Materials Regulations	49 CFR Part 107, sections 171.1-172.558
Hazardous Materials Transportation Act	49 U.S.C. sections 1801-1819 and 49 CFR Parts 101, 106, 107, and 171-180
Occupational Safety and Health Standards, Toxic and Hazardous Substances, Asbestos	Title 29, Volume 6, Chapter 17, section 1910.1001 (a through o)
Environmental Compliance in the United States	DoD Inst. 4715.06
DoD Hazard Communication Program	DoD Inst. 6050.05
Unexploded Ordnance	10 U.S.C. section 2710 et seq.
Endangered Species Act	Title 16, section 1531 et seq., Chapter 38, section 1801 et seq

Legend: CFR = Code of Federal Regulations; DoD = Department of Defense; U.S.C. = United States Code

3.15.2 Affected Environment

The ROI for hazardous materials and wastes includes the geographic footprint of NAVBASE Kitsap-Bremerton, PSNS & IMF, and NAVBASE Kitsap-Bangor, where construction and operation-related actions would occur. The ROI coincides with the geographic area analyzed for public health and safety (Section 3.14).

The Navy implements hazardous material control and management and hazardous waste minimization for all activities through Navy-wide programs promulgated by applicable Office of the Chief of Naval Operations Instructions and at the installation by specific instructions issued by the Installation Commander. These programs include, but are not limited to, the Environmental Readiness Program Manual (OPNAV M-5090.1), Navy Safety and Occupational Health Manual (OPNAV M-5100.23), and DoD Environmental Compliance in the United States (DoD Inst. 4715-06) (DON 2021, DON 2020, DoD 2018). The Navy continuously monitors its operations to find ways to minimize the use of hazardous materials and to reduce the generation of hazardous wastes.

3.15.2.1 Existing Conditions

NAVBASE Kitsap-Bremerton

The Navy implements hazardous material control and management and hazardous waste minimization for all activities through Navy-wide programs promulgated by applicable Office of the Chief of Naval Operations Instructions and at the installation by specific instructions issued by the Installation Commander. These programs include, but are not limited to, the Environmental Readiness Program Manual (OPNAV M-5090.1), Navy Safety and Occupational Health Manual (OPNAV M-5100.23), and DoD Environmental Compliance in the United States (DoD Inst. 4715.06) (Navy 2021, 2024; DoD 2018). The Puget Sound Naval Shipyard & Intermediate Maintenance Facility Hazardous Waste Management Plan (P5090.5) provides detailed guidance pertaining to the generation, identification, collection, storage, and disposal of hazardous waste at NAVBASE Kitsap-Bremerton. The Navy continuously monitors its operations to find ways to minimize the use of hazardous materials and to reduce the generation of hazardous wastes.

The Navy, in cooperation with the EPA, Ecology, WDNR, and Suquamish Tribe, is carrying out remedial actions to address contamination at NAVBASE Kitsap-Bremerton in accordance with Records of Decision (RODs) issued under CERCLA. The contaminated sites are part of the PSNS Superfund Site. There are six ERN OUs that make up the PSNS Superfund Site: OU A, OU B Marine, OU B Terrestrial, OU C, OU D, and OU Naval Supply Center (NSC) (NAVFAC Northwest 2017). The upland project area is within OU B Terrestrial and within OU B Marine for both action alternatives. Detailed information on each OU within the region of influence is summarized in Table 3.15-2 and depicted in Figure 3.15-1.

NAVBASE Kitsap-Bangor

NAVBASE Kitsap-Bangor implements similar hazardous material control and management and hazardous waste minimization programs as those described above for NAVBASE Kitsap-Bremerton.

The Navy, in cooperation with the EPA and Ecology, is carrying out remedial actions to address contamination at NAVBASE Kitsap-Bangor in accordance with the RODs for six ERN OUs: OU 1, OU 2, OU 3, OU 6, OU 7, and OU 8, issued under CERCLA. The contaminated sites are part of the NAVBASE Kitsap-Bangor Superfund Site and are also referred to as the NAVBASE Kitsap-Bangor NPL site, Washington. Each of the six OUs associated with the NAVBASE Kitsap-Bangor Superfund Site consist of one or more contaminated sites (NAVFAC Northwest 2020a).

OU 2 occurs within the project area for Alternative 2 for the forge shop. Specifically, OU 2 intersects the location of a new access road to the forge shop under that alternative. Detailed information on each OU within the region of influence is summarized Table 3.15-2 and depicted in Figure 3.15-2. Soil and groundwater institutional controls are in place to restrict soil and water use, and water consumption (NAVFAC Northwest 2020a).

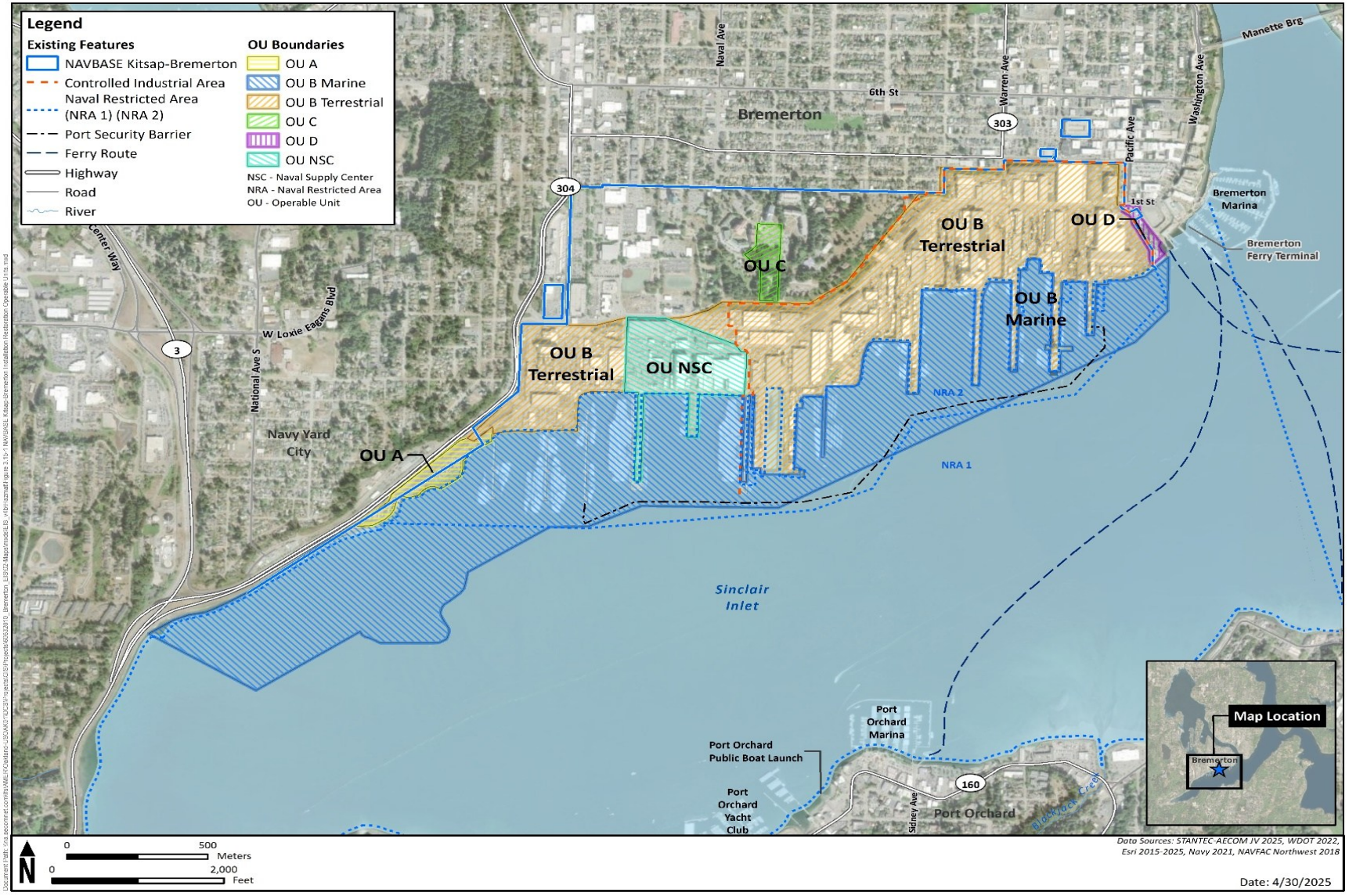

Figure 3.15-1 NAVBASE Kitsap-Bremerton Environmental Restoration Sites

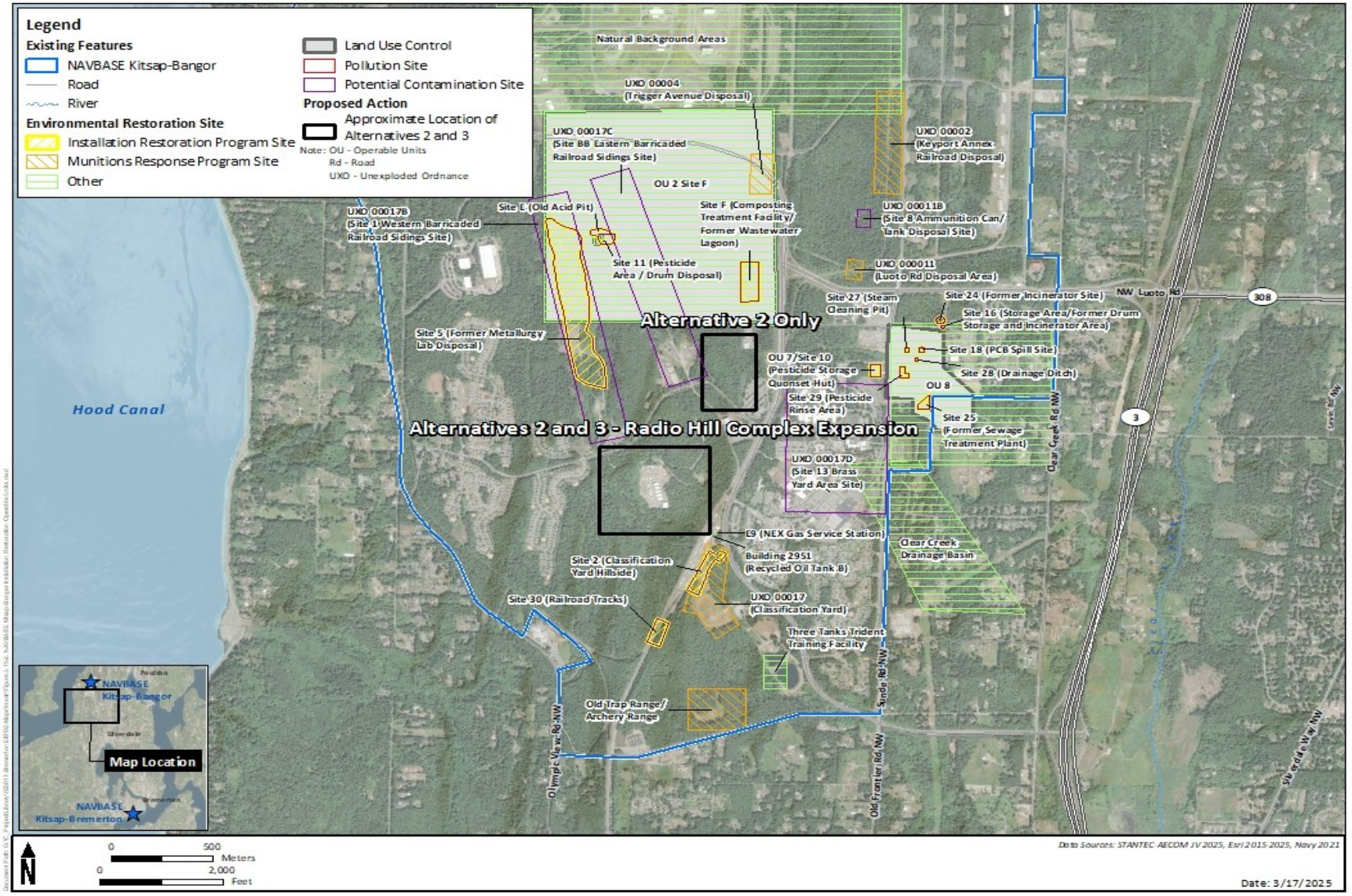

Figure 3.15-2 NAVBASE Kitsap-Bangor Environmental Restoration Operable Units

Table 3.15-2 Environmental Restoration Sites within the Region of Influence

IR Site Name	*Description*
OU A	**Location:** NAVBASE Kitsap-Bremerton. Intertidal area at Charleston Beach and adjacent upland to approximately 10 feet above mean sea level. Fill was placed there from 1946 through the early 1970s. **Contaminants:** Known contaminants in the fill area include deposition of liquid wastes in unlined pits, slag, copper slag grit, dredged material, open burning, construction debris, asbestos fire brick, and industrial waste. Oil was also sprayed there to reduce dust on a former gravel surface. **Past remedial actions:** Soil remedies included an upgraded pavement cap, erosion protection (riprap or cobble/gravel layer), ICs (fencing, warning signs, prohibition of fishing and shellfishing, residential restrictions), monitoring program, regular inspections, and marine and terrestrial habitat enhancements. Groundwater remedies included a monitoring, sampling and analysis plan, 5-year and periodic interim reviews, and regular site inspections. Repair, design, and construction occurred at Charleston Beach to account for natural hazards and compliance with ARARs, including performance of a habitat benefit analysis. As part of the Charleston Beach Remedy Repair design, a maintenance and monitoring plan was also developed to detail the methods used to maintain and monitor the performance of the shoreline repairs for Charleston Beach. **Upcoming remedial actions:** Develop and add a new section to the BNC Terrestrial Annual Remedy Inspection Report to describe ongoing and completed maintenance and repairs to pavement and the stormwater system. Conduct ongoing evaluations of vulnerability to natural hazards and pertinent updates to water quality criteria. **Existing management:** Ongoing operations, maintenance, or monitoring include inspections and maintenance of pavement and erosion protection and evaluation of IC effectiveness. **Institutional or land use controls:** PSNS Superfund Site required controls: access control, groundwater restrictions, excavation management, and land use restrictions. **OU A-specific required controls:** soil management plan.
OU B Marine	**Location:** NAVBASE Kitsap-Bremerton. All of the nearshore marine environment associated with BNC, reaching generally east and west along the shorelines of OU A, OU NSC, OU B Terrestrial, and OU D, and extending an average of approximately 1,500 feet outward into Sinclair Inlet (the exclusion zone for public access to shipyard waters). Includes approximately 230 acres of subtidal land. Water depth to approximately 40 feet. **Contaminants:** Contaminated sediment from historical over-water shipyard activities that occurred in this area, including historical shoreline spills and releases to the marine environment. Contaminants present in upland sources (including upland fill materials) have been transported to the marine environment via drydock discharge, tidal flushing, direct discharge from groundwater, stormwater, and erosion. **Past remedial actions:** Remedies included dredging, CAD, enhanced natural recovery, in situ capping, habitat restoration, shoreline stabilization at Site 1, monitoring and maintenance, and ICs. **Upcoming remedial actions:** Prepare an OU B Marine IC plan to clearly document the OU B Marine IC requirements, associated inspection, inspection frequency and reporting requirements. Perform a source control evaluation focused on transport of mercury through the storm drain system and direct discharge of groundwater to OU B Marine. Prepare an EE/CA and Action Memorandum to address mercury source control and then implement source control actions selected in the Action Memorandum. Prepare a focused feasibility study for mercury, then prepare a ROD amendment (or new ROD or ESD) for mercury after the focused feasibility study is

IR Site Name	*Description*
	completed. Complete a review and revalidation of the bathymetric survey data from the post-construction survey through the 2012 survey in the CAD pit, ENR and thick cap areas to validate if the physical components are functioning as intended by the ROD. **Existing management:** Ongoing operations, maintenance, or monitoring include marine sediment sampling, hydrographic surveys, sub-bottom profile surveys, fish tissue sampling, CAD Pit sampling, and evaluation of IC effectiveness. **Institutional or land use controls:** PSNS Superfund Site required controls: access control, groundwater restrictions, excavation management, and land use restrictions. **OU B Marine-specific controls:** in development.
OU B Terrestrial	**Location:** NAVBASE Kitsap-Bremerton. All land area of BNC not included in other OUs, except north of Farragut Avenue in the western portion of BNC and north and northwest of Decatur Avenue in eastern portion of BNC (approximately 200 acres). This area is almost entirely covered by pavement or buildings. **Contaminants:** Miscellaneous wastes on-site included fill materials used in developing the shoreline area; historical spills and releases from industrial operations; and off-site, upgradient sources of PCE and TCE. **Past remedial actions:** Remedies for both soil and groundwater included limiting human exposure and reducing the potential for chemical transport of contaminants. **Upcoming remedial actions:** Develop a plan to stabilize the shoreline along Segment 4 while considering actions needed in light of the finding that groundwater discharges to surface water in this area. Involve both the OU B Marine and BNC Terrestrial teams in planning for action along Segment 4, and then implement the plan to stabilize the shoreline along Segment 4. Update the BNC Terrestrial IC and O&M Plan to include restrictions for future use of the Building 871 area due to potential cyanide presence in soil and groundwater. Develop and add a new section to the BNC Terrestrial Annual Remedy Inspection Report to describe ongoing and completed maintenance and repairs to pavement and the stormwater system. Conduct ongoing evaluations of vulnerability to natural hazards and pertinent updates to water quality criteria. **Existing management:** Ongoing operations, maintenance, or monitoring include inspection and maintenance, long-term monitoring, and evaluation of IC effectiveness. **Institutional or land use controls:** PSNS Superfund Site required controls: access control, groundwater restrictions, excavation management, and land use restrictions. **OU B Terrestrial-specific controls**: in development.
OU NSC	**Location:** NAVBASE Kitsap-Bremerton. Just west of the north–south centerline of BNC, between Farragut Avenue and the waterfront. Consists of a roughly square-shaped portion of the BNC uplands, approximately 28 acres. **Contaminants:** Historical contamination on-site is a result of fill material used to expand working area into the tidelands and historical spills and releases from site operations that included scrapping and recycling, petroleum storage, and oil reclamation.

IR Site Name	Description
	Past remedial actions: Remedies for soil, groundwater, surface water, and storm drain sediment included site paving enhancement, storm drain soil and debris removal, ICs (excavation management plan), monitoring and review. **Upcoming remedial actions:** Develop and add a new section to the BNC Terrestrial Annual Remedy Inspection Report to describe ongoing and completed maintenance and repairs to pavement and the storm water system. Conduct ongoing evaluations of vulnerability to natural hazards and pertinent updates to water quality criteria. **Existing management:** Ongoing operations, maintenance, or monitoring include inspection and maintenance of pavement and storm drains, groundwater monitoring, and evaluation of IC effectiveness. **Institutional or land use controls:** PSNS Superfund Site required controls: access control, groundwater restrictions, excavation management, and land use restrictions. **OU NSC-specific controls:** in development.
OU 2	**Location:** NAVBASE Kitsap-Bangor. West of the intersection of Trigger Avenue and Luoto Road (Trident Boulevard), east of an unnamed rectangular graded lot, south of Lee Street, and north of Greenfish Court. Consists of a rectangular-shaped polygon of approximately 330 acres. **Contaminants:** Historical contamination on-site comes from a former unlined wastewater lagoon and overflow ditch used between approximately 1960 and 1970 for wastewater disposal. Wastewater at Site F was produced during the demilitarization of ordnance items in an adjacent segregation facility building. Wastewater contained relatively high concentrations of the explosives TNT and RDX and lower concentrations of other explosive compounds. **Past remedial actions:** Focused on contaminated soil removal and contaminated groundwater plume migration containment and treatment. Soil remedies included excavation of 500 cubic feet of soil from former lagoon site and burned at an off-site facility. The former lagoon was backfilled and covered with asphalt. Groundwater remedies included extraction wells, extracted water pump and treatment, GAC, re-infiltration of cleaned water to the aquifer, thermal destruction of ordnance compounds at an off-site facility, and anaerobic biodegradation. A biostimulation pilot test was conducted in the OU 2 source area to assess the ability to degrade ordnance compounds. Field activities began in June 2023 and continued through the summer of 2024. Results from the pilot testing will support the focused feasibility study to address improvements to the P&T remedy. **Upcoming remedial actions:** None. **Existing management:** Ongoing monitoring of the groundwater remediation program for effectiveness and operational adjustments to maximize effectiveness. **Institutional or land use controls:** ICs are in effect for soil and includes monitoring and inspection. ICs are in effect to prevent use and consumption of untreated groundwater on- and off-installation. Future deed restrictions may be placed on the property to restrict land use.

Legend: ARAR = applicable or relevant and appropriate requirement; BNC = Bremerton Naval Complex; CAD = confined aquatic disposal; EE/CA = Engineering Evaluation/Cost Analysis; ENR = enhanced natural recovery; ESD = Explanation of Significant Differences; GAC = granular activated carbon; IC(s) = Institutional Control(s); IR = Installation Restoration; NAVBASE = Naval Base; NSC = Naval Supply Center; O&M = operations and maintenance; OU = Operable Unit; PCE = tetrachloroethene (or perchloroethylene); PSNS = Puget Sound Naval Shipyard; P&T = Pump-and-Treat; RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine; ROD = Record of Decision; TCE = trichloroethene; TNT = 2,4,6-trinitrotoluene

Sources: NAVFAC Northwest 2017, NAVFAC Northwest 2019, NAVFAC Northwest 2020a, Washington Department of Ecology 2022

3.15.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Tables 3.15-3 and 3.15-4 summarize the potential effects to hazardous materials and wastes associated with RFFAs with a close causal relationship to the project at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, respectively. In addition to those listed below, dredging of Sinclair Inlet sediment would also result in beneficial long-term effects by removing contaminated sediment and thereby reducing the potential for environmental (i.e., ecological receptor) and human health exposure.

Table 3.15-3 Effects to Hazardous Materials and Wastes from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – Pier 3 Electrical Substation Repair, PSNS & IMF	RFFA located within PSNS & IMF	This RFFA could contribute to total PSNS & IMF use of hazardous materials and output of hazardous wastes associated with demolition and construction activities during the period covered by this project action.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF, and NAVBASE Kitsap-Manchester	RFFA located within PSNS & IMF	This RFFA could contribute to total PSNS & IMF use of hazardous materials and output of hazardous wastes associated with demolition and construction activities during the period covered by this project action.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	This RFFA could contribute to total PSNS & IMF use of hazardous materials and output of hazardous wastes associated with demolition and construction activities during the period covered by this project action.
Navy – SIOP, PSNS & IMF	RFFA located within PSNS & IMF	This RFFA could contribute to total PSNS & IMF use of hazardous materials and output of hazardous wastes associated with demolition and construction activities during the period covered by this project action.
Navy – Operable Unit B Marine Source Removal Actions	RFFA located within PSNS & IMF	This RFFA could reduce the marine surface sediment contaminant concentrations through mercury source control and/or dredging and off-site disposal of contaminated dredged material. Additionally, it could improve water quality and potentially enable consumption advisories to be reduced or lifted. This would be mostly a long-term benefit and thus applicable to project operations; however, any remedial activities that improve water quality during the project construction phase would also be beneficial.
Navy – NAVBASE Kitsap-Manchester CERCLA Actions for PFAS	NAVBASE Kitsap-Manchester, approximately 5 miles east of the study area.	This RFFA could evaluate areas at risk of PFAS and delineate contamination sites for future disposal efforts.
Navy –Operable Unit A, Operable Unit B Terrestrial, and Operable Unit NSC CERCLA Actions for PFAS	RFFA located within PSNS & IMF	This RFFA could evaluate areas at risk of PFAS and delineate contamination sites for future disposal efforts.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
City of Bremerton – 6th Street Pavement Preservation Project Phase III	RFFA located outside PSNS & IMF	None.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	RFFA located outside PSNS & IMF	None.
Port of Bremerton – Marina Breakwater Replacement, Port Orchard Marina	RFFA located outside PSNS & IMF	None.
Private Development – The Beacon and Beacon II	RFFA located outside PSNS & IMF	None.
Private Development – McWilliams Apartments	RFFA located outside PSNS & IMF	None.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = United States Department of the Navy; NSC = Naval Supply Center; PFAS = per and polyfluoroalkyl substances; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; RFFA = reasonably foreseeable future action; SIOP = Shipyard Infrastructure Optimization Program

Table 3.15-4 Effects to Hazardous Materials and Wastes from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy - Transit Protection Program Pier and Support Facilities	Located outside of NAVBASE Kitsap-Bangor Proposed ROI	None.
Navy - Child Development Center	Located within NAVBASE Kitsap-Bangor Proposed ROI	This RFFA would occur near the expanded mission support area (Radio Hill complex) and could contribute to use of hazardous materials and output of hazardous wastes associated with demolition and construction activities during the period covered by this project action.
Navy - Military Working Dog Kennel Replacement	Located within NAVBASE Kitsap-Bangor Proposed ROI	This RFFA would occur near the proposed forge shop location and could contribute to use of hazardous materials and output of hazardous wastes associated with demolition and construction activities during the period covered by this project action.
Navy - Repair Substation 5	Located outside of NAVBASE Kitsap-Bangor Proposed ROI	None.
Navy - Tang Road Repair	Located outside of NAVBASE Kitsap-Bangor Proposed ROI	None.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy - Equipment Processing Building	Located outside of NAVBASE Kitsap-Bangor Proposed ROI	None.
Navy - Relocate Flier Road	Located outside of NAVBASE Kitsap-Bangor Proposed ROI	None.
Navy – CERCLA Action for PFAS	Located outside of NAVBASE Kitsap-Bangor Proposed ROI	None.
Navy – CERCLA Operable Unit 1 Site A	Located outside of NAVBASE Kitsap-Bangor Proposed ROI	None.
Navy – CERCLA Operable Unit 2 Site F	Located outside of NAVBASE Kitsap-Bangor Proposed ROI	None.
Navy – Alternative Power Transmission Line	Located mostly outside of NAVBASE Kitsap-Bangor Proposed ROI	None.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; NAVBASE = Naval Base; Navy = United States Department of the Navy; PFAS = per- and polyfluoroalkyl substances; RFFA = reasonably foreseeable future action; ROI = Region of Influence; UXO = unexploded ordnance

3.15.3 Environmental Consequences

The hazardous materials and wastes analysis addresses issues related to the use and management of hazardous materials and wastes as well as the presence and management of specific cleanup sites within the ROI. This section discusses potential impacts that could result from hazardous materials and wastes, as a result of implementation of the action alternatives and the no-action alternative. The effects analysis evaluated the potential for beneficial or adverse impacts in consideration of BMPs listed in Tables 3.15-5 and 3.15-6. The BMPs listed in Tables 3.15-5 and 3.15-6 are measures that the Navy would implement to reduce the environmental impacts of designated activities, functions, or processes at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor, respectively.

3.15.3.1 Nature and Type of Effects

The hazardous materials and wastes assessment determined the extent to which action alternatives would introduce new activities or processes that may release hazardous materials and wastes or may impact existing hazardous materials and wastes in a manner that could increase pathways to human or environmental exposure. The assessment evaluated the spatial extent of the construction footprint at NAVBASE Kitsap-Bremerton and PSNS & IMF to determine overlap with existing areas containing COCs.

Effects to hazardous materials and wastes and the potential to alter human or environmental pathways could primarily result from resuspension and potential dispersion of contaminated sediment due to in-water work or materials transport, potential release of COCs that could result from upland ground disturbance, or release of COCs as a result of facility demolition. The potential for adverse effects is expected to be reduced through standard operating procedures and BMPs (Tables 3.15-5 and 3.15-6, BMPs HAZ MGMT-1 through -6).

Table 3.15-5 Hazardous Materials and Wastes Best Management Practices at NAVBASE Kitsap-Bremerton

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
HAZ MGMT BREM-1	Impacts on public health and safety and water quality from hazardous materials	Contamination Management • Hazardous materials shall be identified and remediated in compliance with all applicable regulations prior to demolition or renovation. Compliance with regulations shall be included in any construction, demolition, or renovation contract language. Additionally, prior to construction work, it is recommended to consult with the appropriate Navy Remedial Project Manager for the current remediation status of the ERN site. No intrusive or construction activities shall occur without the knowledge and concurrence of the Navy Environmental Restoration Program. Spill Response • Training in proper handling of used oil or hazardous substances, aboveground fixed tank construction, inspecting and draining of impervious secondary containment berms/systems, good housekeeping practices, engineering controls such as containments during painting and blasting operations, daily inspections, and drainage control shall be provided, prior to initiating work. • Refueling of equipment shall only be permitted at approved fueling facilities and at least 50 feet from the water. A contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored onsite, if appropriate, to facilitate clean-up of accidental petroleum releases. • Fueling of vessels shall be done at approved fueling facilities. With respect to equipment that cannot be fueled out of the water (e.g., barge crane), spill prevention booms shall be employed.	Construction and Operations
HAZ BREM MGMT-2	Impacts to water resources	Laydown and construction material areas shall be maintained at least 50 feet from the shoreline when practicable, and operations may be ceased when weather conditions elevate the potential for significant precipitation or floods.	Construction
HAZ BREM MGMT-3	Impacts to public health and safety	During ground disturbance, water shall be used for dust control, along with the implementation of a SWPPP, Erosion Control Plan, Environmental Mitigation plans, and/or Health and Safety Plan to minimize potential impacts.	Construction
HAZ BREM MGMT-4	Impacts to water resources	Prior to soil or sediment disturbance, Land Use Controls or restrictions shall be identified and marked for avoidance as applicable. For any ground disturbance work, the PSNS & IMF (and any applicable ERN site) soil management plan would be consulted, and project monitoring shall be required.	Construction

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
HAZ BREM MGMT-5	Impacts to soils	If contaminated soil or water is encountered, the following BMPs would be followed, and the Navy's Remedial Project Manager shall be notified to address the area under the ERN program. The reduction of impacts to soils from petroleum contamination and abandoned fuel lines at the new substation include the following: • Excavated soil that is contaminated shall not be placed into a clean excavation. Redeposited contaminated soil shall be provided with a clean soil or cap of asphalt/concrete once work has been completed. • When excavating, if staining, petroleum odor, or a sheen in the water is observed, the dewatering discharge shall be reinfiltrated within the work area with known or observed contamination where the water was extracted and within the same aquifer. The contractor shall cut and remove fuel pipelines as needed if they are conflicting with the new underground utility/structure construction. The open ends of pipelines shall be capped and secured.	Construction
HAZ BREM MGMT-6	Impacts to soils	Development of a soil and sediment management plan is recommended. The management plan may include, but is not limited to, applicable Environmental Action Levels, pre-determined relocation areas, and various sampling and management plans.	Construction

Legend: BMP = Best Management Practice; ERN = Environmental Restoration; MGMT = Management; Navy = U.S. Navy; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; SWPPP = Stormwater Pollution Prevention Plan

Table 3.15-6 Hazardous Materials and Wastes Best Management Practices at NAVBASE Kitsap-Bangor

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
HAZ MGMT BANGOR-1	Impacts on public health and safety and water quality from hazardous materials	Contamination Management • Hazardous materials shall be identified and remediated in compliance with all applicable regulations prior to demolition or renovation. Compliance with regulations shall be included in any construction, demolition, or renovation contract language. Additionally, prior to construction work, it is recommended to consult with the appropriate Navy Remedial Project Manager for the current remediation status of the ERN site. No intrusive or construction activities shall occur without the knowledge and concurrence of the Navy Environmental Restoration Program. • Intrusive construction activities shall require explosive safety protocols, construction support and/or UXO qualified personnel to remove explosive hazards in the construction footprint before intrusive construction work occurs. For dredging and in-water work, a non-essential personnel safety zone would be established to keep people safe and clear of potential MEC detonation. Once hardpan is reached, the safety zones would be removed. Spill Response • Training in proper handling of used oil or hazardous substances, aboveground fixed tank construction, inspecting and draining of impervious secondary containment berms/systems, good housekeeping practices, engineering controls such as containments during painting and blasting operations, daily inspections, and drainage control shall be provided prior to initiating work. • Refueling of equipment shall only be permitted at approved fueling facilities and at least 50 feet from the water. A contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases. • Fueling of vessels shall be done at approved fueling facilities. With respect to equipment that cannot be fueled out of the water (e.g., barge crane), spill prevention booms shall be employed.	Construction and Operations
HAZ BREM MGMT-2	Impacts to water resources	Laydown and construction material areas shall be maintained at least 50 feet from the shoreline when practicable, and operations may be ceased when weather conditions elevate the potential for significant precipitation or floods.	Construction

BMP	*Impacts Reduced/ Avoided*	*Description*	*Applicability*
HAZ BANGOR MGMT-3	Impacts to public health and safety	During ground disturbance, water shall be used for dust control, along with the implementation of a SWPPP, Erosion Control Plan, Environmental Mitigation plans, and/or Health and Safety Plan to minimize potential impacts.	Construction
HAZ BANGOR MGMT-4	Impacts to water resources	Prior to soil or sediment disturbance, Land Use Controls or restrictions shall be identified and marked for avoidance as applicable. For any ground disturbance work, any applicable ERN site management plan would be consulted, and project monitoring shall be required.	Construction
HAZ BANGOR MGMT-5	Impacts to soils	If contaminated soil or water is encountered, the following BMPs would be followed, and the Navy's Remedial Project Manager shall be notified to address the area under the ERN program. The reduction of impacts to soils from petroleum contamination and abandoned fuel lines at the new substation include the following: • Excavated soil that is contaminated shall not be placed into a clean excavation. Redeposited contaminated soil shall be provided with a clean soil or cap of asphalt/concrete once work has been completed. • When excavating, if staining, petroleum odor, or a sheen in the water is observed, the dewatering discharge shall be reinfiltrated within the work area with known or observed contamination where the water was extracted and within the same aquifer. The contractor shall cut and remove fuel pipelines as needed if they are conflicting with the new underground utility/structure construction. The open ends of pipelines shall be capped and secured.	Construction
HAZ BANGOR MGMT-6	Impacts to soils	Development of a soil and sediment management plan is recommended. The management plan may include, but is not limited to, applicable Environmental Action Levels, pre-determined relocation areas, and various sampling and management plans.	Construction

Legend: BMP = Best Management Practice; ERN = Environmental Restoration; MEC = munitions of explosive concern; MGMT = Management; Navy = United States Department of the Navy; SWPPP = Stormwater Pollution Prevention Plan; UXO = unexploded ordnance

3.15.3.2 Impact Assessment Methodology

The hazardous materials and waste assessment determined the extent to which action alternatives could release hazardous materials or interact with existing hazardous materials in a manner that could increase pathways to human or environmental exposure.

Effects were considered potentially significant if:

- Activities result in short- or long-term disturbance of contaminated soil, where there is the potential that some excavated material may designate as hazardous waste. Land uses with the potential to disturb contaminated soil are permitted within the OUs as Land Use Controls and the Excavation Management Plan have been established. PSNS is an industrial site where the Navy anticipated the need for future construction and routine maintenance in the CERLA RODs. Land use controls like excavation management have been established. The NAVBASE Kitsap-Bremerton Excavation Management Plan has procedures for contractors to follow when excavation is necessary during new construction (or routine maintenance). These exaction procedures are intended to protect human health and the environment and maintain ROD remedies. The established plan includes appropriate measures, controls, and BMPs to be implemented during construction when working in the Ous.
- Temporary disturbance of facilities and building material containing hazardous substances cause exceedance of applicable regulatory levels associated with exposure to building materials containing hazardous substances.
- Accidental chemical releases occur during long-term project-related operations of PSNS & IMF.

The following assumptions were made in completing this assessment:

- There are no MEC in the NAVBASE Kitsap-Bremerton portion of the project ROI (NAVFAC Northwest 2020b).
- Sediment within the project area is known to be contaminated. Sediment characterization efforts would be completed in consultation with Dredge Material Management Office to determine dredged material suitability for open water disposal. No dredged material would be reused. Unsuitable dredged material would be disposed of off-site at an approved upland landfill or landfills. Suitable dredged material would be disposed of off-site at the Elliott Bay Open Water Disposal Site.
- Chemical contamination within the ROI is based on available studies within the Navy's ERP and EPA's CERCLA program. A CERCLA investigation is ongoing in the project area. The necessity and magnitude of a remedial action would be based on PFAS delineation and risk evaluation.
- Hazardous Building Material (HBM) (e.g., asbestos, lead, PCBs) surveys would be completed for all facilities and buildings prior to demolition or modification.

3.15.3.3 Impact Analysis for Alternative 1: No-Action

Under the no-action alternative, the Proposed Action would not proceed. However, potential effects associated with RFFAs could contribute to hazardous substance contamination in the ROI. Additionally, under the no-action alternative, seismic upgrades would not occur, and existing waterfront resources (including existing hazardous materials and waste) would remain vulnerable to damage or destruction from vigorous ground movement. Damaged or destroyed waterfront resources could lead to hazardous

materials being released into the environment within the ROI. Therefore, adverse effects could occur under the no-action alternative.

3.15.3.4 Impact Analysis for Alternative 2 (Preferred Alternative)

The sections below address potential impacts related to hazardous materials and wastes during construction and operation under Alternative 2.

Under Alternative 2, there would be an increase in the use of hazardous substances (i.e., POLs) and generation of solid waste and potentially hazardous waste associated with construction activity during the construction phase. As described in Section 3.3.3.4, construction activity occurring within OU-B Terrestrial would have the potential to encounter soil and groundwater contamination. To minimize potential hazards to human health and the environment, excavated material would be stockpiled and dewatered, tested, and treated as necessary and as described in construction BMPs WATER MGMT BREM-1 through 3 and WATER MGMT BANGOR-1 through 3. Operational impacts from hazardous materials and wastes handling would be controlled with the implementation of the BMPs or eliminated through project design that would incorporate all applicable federal, state, DoD, and Navy safety standards and requirements.

Hazardous materials and waste impact reduction measures considered in the design include the following:

- Identification of locations with LUCs or other use restrictions within the project footprint
- Spill response plan
- Stormwater pollution prevention plan
- Site drainage and dewatering control
- Solid waste management plan
- Hazardous waste management plan
- Hazardous materials storage plan
- Training in proper handling of POLs and other hazardous substances, and good housekeeping practices
- Utilization of impervious secondary containment systems and engineering controls for containment and operations
- Daily inspections of the construction site vehicles, equipment, and BMPs
- Vehicle, vessel, and motor fueling management (use of drip pads beneath motors and limitations on fueling in proximity to water)
- Excavation management plan
- Dredge and disposal quality control plan
- Stockpile management (including stockpile dust control measures, erosion control, runoff treatment, and other elements of the SWPPP)
- Fugitive dust control measures

Construction-related Impacts

Construction-related impacts under Alternative 2 related to in-water construction (including dredging, pile driving, shoreline protection, and quay wall construction), COCs from construction/demolition, and upland soil and groundwater disturbance are listed below.

Construction

- Portions of the M2D2 construction would occur in the dry. In general, construction in a dry environment is preferred over construction in-water because it offers some separation between spills (should they occur) and direct contact with Sinclair Inlet. The potential for impacts from hazardous materials and waste are lower with the Alternative 2 option of the new M2D2 construction.
- Construction of a new Pier 2 – Potential for impacts from hazardous materials and waste from the construction of a new Pier 2 is unique to Alternative 2.
- Construction of a new forge shop at NAVBASE Kitsap-Bangor – Potential for impacts from hazardous materials and waste from the construction of a new forge shop at NAVBASE Kitsap-Bangor is unique to Alternative 2.

Construction actions, and demolition in particular, could result in adverse effects by causing hazardous building materials to become airborne, become a respiratory hazard to workers, and contaminate adjacent surface soil and water. However, potential impacts would be minimized through abatement or encapsulation of hazardous building materials prior to demolition and by ensuring that abatement or encapsulation of any hazardous building materials and waste handling follow applicable rules and regulations to minimize exposure for workers and the public. Consequently, the potential for adverse impacts related to hazardous building materials is considered minimal and limited to the construction phase of the project.

There is more construction occurring under Alternative 2, which means a greater use of hazardous materials and higher generation of hazardous waste, than Alternative 3. However, the method of construction of the new M2D2 selected under Alternative 2 has lower potential for contamination risk due to construction in a dry environment.

In-water Demolition

- Demolition of existing DD3 – Demolition activities generally involve the use of hazardous substances (i.e., POLs), the generation of hazardous waste, and an increase in potential for contamination, especially when the demolition is occurring in-water. Demolition of a dry dock (in this case, DD3) only occurs under Alternative 2.
- Demolition of both Piers 4 and 7 occurs under Alternative 2.

In-water work or ground disturbance in areas of known contamination could impact existing hazardous materials or COCs in a manner that increases human or environmental (i.e., ecological receptor) and human (health) exposure. For instance, disturbance of contaminated sediment through in-water work would cause contaminants to become re-suspended. Alternatively, ground disturbance of contaminated soil during construction activities could cause contaminants to become airborne. Areas of potential overlap with in-water or upland ERN sites are summarized in Table 3.15-7. For each of these areas, construction activities would comply with applicable excavation management plans, LUC plans, project-specific health and safety plans, RCRA requirements for hazardous waste tracking and disposal, the PSNS

& IMF Waste Management Plan (Navy 2020), and BMPs (Tables 3.15-5 and 3.15-6, HAZ MGMT-1 through -6) to minimize potential impacts.

There is more in-water demolition occurring under Alternative 2, which means a greater use of hazardous substances (i.e., POLs), higher generation of hazardous waste, and greater potential for contamination.

Table 3.15-7 Environmental Restoration Sites with Overlap to Project Ground Disturbance

ERN Site	*NAVBASE Kitsap Location*	*Elements with Ground Disturbance Overlap to ERN Site* [a]	*Description of Potential Impact*	*Past and Present Remedies Implemented On-site*
OU B Marine	Bremerton (Figure 3.15-1)	• DD3 • New Pier 2 • Piers 4 and 7 • Mooring A • Wharf 2 • Dredging	Resuspension of contaminated sediment during demolition and construction. Contaminated sediment was formerly subjected to: • Historical over-water shipyard activities • Historical shoreline spills and releases to the marine environment • Stormwater-delivered contaminants and sediment	Remedies included sediment dredging, CAD, enhanced natural recovery, in situ capping, habitat restoration, shoreline stabilization, monitoring and maintenance, and ICs. Ongoing operations, maintenance, or monitoring include marine sediment sampling, hydrographic surveys, sub-bottom profile surveys, tissue sampling, CAD pit sampling, and evaluation of IC effectiveness.
OU B Terrestrial	Bremerton (Figure 3.15-1)	• DD3 • Trenching and excavation • Dewatering • Pavement or vegetative cover removal • GW monitoring wells	Contact with COCs in soil from: • Miscellaneous wastes on-site, including fill materials used in developing the shoreline area • Historical spills and releases from industrial operations; and off-site, upgradient sources of PCE and TCE	Remedies for both soil and groundwater included limiting human exposure and reducing the potential for chemical transport of contaminants. Ongoing operations, maintenance, or monitoring include inspection and maintenance, long-term monitoring, and evaluation of IC effectiveness.

ERN Site	*NAVBASE Kitsap Location*	*Elements with Ground Disturbance Overlap to ERN Site* [a]	*Description of Potential Impact*	*Past and Present Remedies Implemented On-site*
OU Site F	Bangor (Figure 3.15-2)	New Road to forge shop (Alternative 2 only)	Potential impact from contact with COCs from soil and groundwater: • Contaminated by historical use of the lagoon and ditch by demilitarization of ordnance items	Remedies for both soil and groundwater included excavation of soil, thermal destruction of COCs, backfill with clean soil, groundwater extraction, groundwater treatment, anaerobic degradation, and clean water infiltration to aquifer.

Note: [a] "Ground disturbance" refers to "sediment disturbance" in relation to OU B Marine as it is a sediment site.
Legend: CAD = confined aquatic disposal; COC = contaminant of concern; DD = dry dock; GW = groundwater; IC = institutional control; ERN = Environmental Restoration; OU = Operable Unit; PCE = tetrachloroethene (or perchloroethylene); TCE = trichloroethene
Sources: NAVFAC Northwest 2017, 2019, 2020a; Ecology 2022

Replace/Upgrade/Reconfiguration

- Replacement of E, F, and H Streets – The replacement of E, F, and H Streets only occur under Alternative 2; however, Alternative 3 does involve the configuration of a different street.

There are generally more replacement activities occurring under Alternative 2, which means a greater potential use of hazardous materials, higher generation of hazardous waste, and higher potential for contamination.

Upland Work: Demolition

Building and facility demolition at PSNS & IMF would be required to provide adequate space for project construction and operations. Building and facility demolition for Alternative 2 would include:

- DD3, Pier 6 (including Hammerhead Crane), Pier 7, approximately 35 permanent buildings and utility facilities, and more than 50 trailers, modular units, sheds, and enclosures (see Tables 2-12 and 2-13). Asphalt and concrete paving would also be required as part of demolition activities. Upland demolition under Alternative 2 involves more dock/mooring infrastructure, more piers, more buildings, and more trailers.
- Demolition of the existing forge shop.

There is more upland demolition occurring under Alternative 2, which means a greater potential use of hazardous substances (i.e., POLs), higher generation of hazardous waste, and higher potential for contamination.

Dredging

- Dredge to establish drafts at wharves and piers, and as required for demolition of existing structures – Dredging generally involves the use of hazardous substances (i.e., POLs) and has the potential for contamination of water from spills. Dredged material may contain contaminated sediment that would make it unsuitable for open water disposal. There are potential short-term adverse effects to marine water quality from dredging of contaminated sediment from within OU B Marine. Dredging and off-site disposal of dredged material that exceeds the Dredged Material Management Program (DMMP) screening levels would improve localized water quality

and surface sediment quality conditions in the project area. As Alternative 2 has a much lower dredge volume, the potential water quality impacts and waste volume are much lower.

Dredging is considered an impact to Waters of the United States.

Collectively, Alternative 2 would have a greater potential for impacts from use of hazardous materials and POLs, generation of hazardous waste, and potential for contamination from spills in the areas of construction, in-water demolition, replacement activities, and upland demolition. With implementation of BMPs, the potential for adverse impacts related to hazardous materials and wastes from construction activities under Alternative 2 is considered to be low.

Operation-related Impacts

Operational impacts from hazardous materials and wastes handling would be controlled or eliminated through project design that would incorporate all applicable standards and requirements relevant to federal, state, DoD, and Navy safety standards and requirements. Operation-related impacts under Alternative 2 would be similar to existing shipyard operations. Adverse environmental impacts due to hazardous materials and wastes are not anticipated from operations.

Effects Associated with Reasonably Foreseeble Future Actions

When combined with RFFAs, there would be additive impacts to hazardous materials and wastes within the ROI; however, there would also be beneficial additive impacts from removal of contaminated sediment.

3.15.3.5 Impact Analysis for Alternative 3

The sections below address potential impacts related to hazardous materials and wastes during construction and operation under Alternative 3. Many of the Alternatives 2 and 3 project components are generally the same (e.g., pier replacement, dredging, facility upgrades); the only actions that are identical in both action alternatives are the demolition and replacement of Pier 4 at NAVBASE Kitsap-Bremerton and the construction of the expanded mission support area (Radio Hill complex) area (and associated structures) at NAVBASE Kitsap-Bangor.

Construction-related Impacts

Construction-related impacts of Alternative 3 would be similar to Alternative 2 for hazardous materials and wastes related to in-water construction (including dredging, pile driving, shoreline protection, and quay wall construction), COCs from construction/demolition, and upland ground disturbance. Impacts to hazardous materials and wastes from elements unique to Alternative 3 are listed below.

Construction

- Construction of the new M2D2 would occur ‘in the wet,’ unlike under Alternative 2 – As noted in Alternative 2, construction in a dry environment is preferred over construction in-water because it offers some separation between spills (should they occur) and direct contact with water bodies. The potential for impacts from hazardous materials and waste are higher with the Alternative 3 option of the new M2D2 construction.

As noted in Alternative 2, there would be less construction occurring under Alternative 3 and less use of hazardous materials and generation of hazardous waste. However, the method of construction of the new M2D2 selected under Alternative 3 has higher potential for contamination risk than construction of the new M2D2 under Alternative 2.

In-water Demolition

- Demolition of Mooring A – Demolition of Mooring A only occurs under Alternative 3; however, it is overall less demolition than would occur under Alternative 2.
- Demolition of Piers – Pier demolition under Alternative 2 includes the demolition of Piers 4, 6 and 7 whereas Alternative 3 would demolish only Pier 4.

There is less in-water demolition proposed under Alternative 3, which means less use of hazardous materials, lower generation of hazardous waste, and lower potential for contamination than Alternative 2.

Replace/Upgrade/Reconfiguration

- Construction of Wharf 2 –Construction of Wharf 2 only occurs under Alternative 3.
- Reconfiguration of Wycoff Way – The reconfiguration of Wycoff Way only occurs under Alternative 3; however, Alternative 2 does involve the replacement of E, F, and H Streets.

As noted in Alternative 2, there are generally fewer replacement activities occurring under Alternative 3, which means a lower potential use of hazardous materials, lower generation of hazardous waste, and lower potential for contamination, than under Alternative 2.

Upland Work: Demolition

Building and facility demolition at PSNS & IMF would be required to provide adequate space for project construction and operations. Building and facility demolition for Alternative 3 would include:

- Mooring A, and approximately 26 permanent buildings and utility facilities, and five enclosures (see Tables 2-12 and 2-13). Upland demolition under Alternative 3 involves less dock/mooring infrastructure, fewer piers, fewer buildings, and fewer trailers, although more enclosures than Alternative 2. Both Alternatives 2 and 3 would require asphalt and concrete paving following demolition activities.

There is less upland demolition occurring under Alternative 3, which means a lower potential use of hazardous materials, less generation of hazardous waste, and lower potential for contamination, than under Alternative 2.

Dredging

- Dredge to establish drafts at wharves and piers, and as required for demolition of existing structures – both Alternatives 2 and 3 require this dredging.
- Dredge new turning basin – Dredging of the new turning basin would only occur under Alternative 3. This is the only dredging action proposed that would occur in part outside of the NRA.

Dredging is considered an impact to Waters of the United States.

Collectively, Alternative 3, would have a lower potential for impacts from use of hazardous materials and demolition, generation of hazardous waste, and potential for contamination from spills than Alternative 2 in the areas of construction, in-water demolition, replacement activities, and upland demolition. Alternative 2 would have higher potential for these types of impacts in all areas except for dredging. As with Alternative 2, potential hazards would be minimized with the implementation of standard construction site BMPs, pertinent Hazardous Materials and Wastes BMPs (see Tables 3.15-6

and 3.15-7), and Water Management BMPs as appropriate (see Table 3.3-5). With implementation of BMPs, the potential for adverse impacts related to hazardous materials and wastes from construction activities under Alternative 3 is considered to be low.

Operation-related Impacts

Operational impacts from hazardous materials and wastes handling would be controlled or eliminated through project design that would incorporate all applicable standards and requirements relevant to federal, state, DoD, and Navy safety standards and requirements. Operation-related impacts under Alternative 3 would be similar to existing shipyard operations. Adverse environmental impacts due to hazardous materials and wastes are not anticipated from operations.

Effects Associated with Reasonably Foreseeable Future Actions

When combined with RFFAs, there would be additive impacts to hazardous materials and wastes within the ROI; however, there would also be beneficial additive impacts from removal of contaminated sediment.

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3.16 Socioeconomics

This section discusses population demographics, employment characteristics, schools, housing occupancy status, economic activity, tax revenue, and related data providing key insights into the socioeconomic conditions that might be affected by the Proposed Action.

3.16.1 Regulatory Setting

Table 3.16-1 provides a list of the existing regulatory requirements for socioeconomics at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor. Appendix C lists all applicable federal, state, and local laws and regulations.

Table 3.16-1 Regulatory Setting for Socioeconomics

Law, Regulation, or Guidance	*Regulatory Citation*
Federal	
Section 101 of NEPA sets forth a national policy "to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."	42 U.S.C. 4331(a)

Legend: NEPA = National Environmental Policy Act

3.16.2 Affected Environment

The ROI for socioeconomics consists of Kitsap County (Figure 3.16-1). While many impacts will occur in the immediate vicinity of NAVBASE Kitsap-Bremerton or NAVBASE Kitsap-Bangor, socioeconomic impacts created by local spending and hiring tend to ripple into the surrounding community and region, which makes the county an appropriate ROI. Socioeconomic data provided in this section is presented for the U.S. Census-defined geographical areas of Kitsap County, the City of Bremerton, and the State of Washington. This data was used to characterize baseline socioeconomic conditions, which were then used to gauge the level of impacts that are associated with project activities. Data was collected from documents published by federal, state, and local agencies as well as from state and national databases (e.g., U.S. Census Bureau and U.S. Bureau of Economic Analysis).

3.16.2.1 Existing Conditions

Existing conditions in the ROI are described in terms of population, schools, housing, employment and income, overall economic activity, and state and local tax revenues.

At the time of this analysis, the most recent available data for some economic indicators fell during a time when the United States and much of the world was suffering from an economic recession brought on by the COVID-19 pandemic. Much of the information reflecting this reduced economic activity and the subsequent recovery is still being compiled and is not yet available in state and national databases used for the analysis.

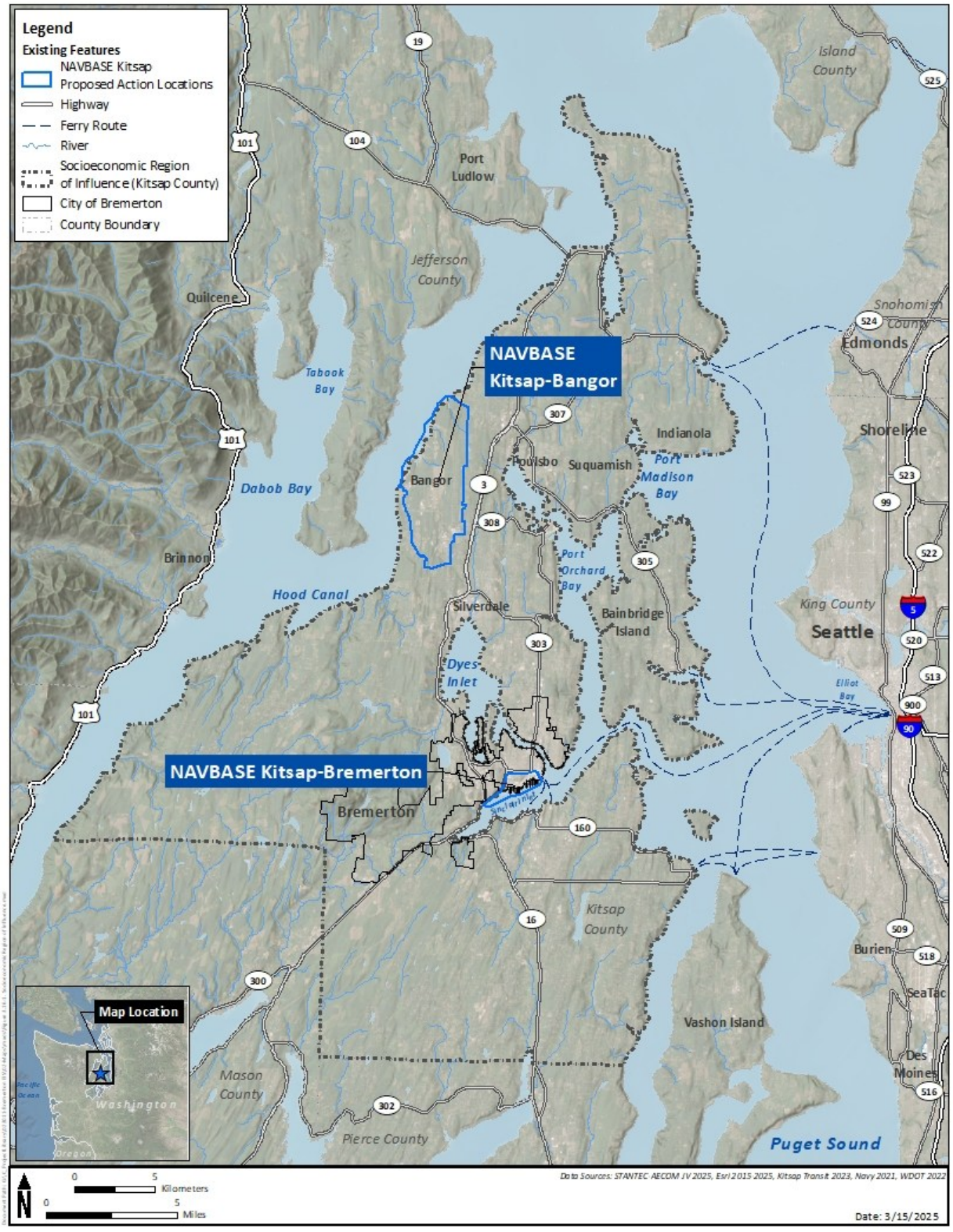

Figure 3.16-1 Socioeconomic Region of Influence

Additionally, due to the unprecedented nature of the recession, estimates of future economic recovery levels and their timeframes are uncertain. Where recent data is available, it has been incorporated into the discussion and analysis.

Population

According to the U.S. Census Bureau, the total 2023 population for Kitsap County was 276,581, of which the City of Bremerton comprised approximately 16.1 percent (U.S. Census Bureau 2023). Table 3.16-2 shows that Bremerton, Kitsap County, and the State of Washington all experienced population gains from 2010 to 2023 (U.S. Census Bureau 2010, 2023). Population growth in Kitsap County, however, was slower than in the State of Washington as a whole.

Table 3.16-2 Population in the City of Bremerton, Kitsap County, and the State of Washington 2000–2020

Year	*Bremerton*	*Kitsap County*	*State of Washington*
2010	37,729	251,133	6,724,540
2023	44,531	276,581	7,740,984
Percentage Change (2010-2023)	18.0 percent	10.1 percent	15.1 percent

Source: U.S. Census Bureau 2010, 2023

Schools

During the 2020–2021 school year, Kitsap County included a total of 78 public schools with 33,966 students (Table 3.16-3). Private school data was available for the 2019–2020 school year when there were 23 private schools with 2,277 students. In total, Kitsap County has 101 schools and 36,243 students.

Table 3.16-3 Kitsap County Schools

School Type	*Number of Schools*	*Number of Students*
Public Schools (2020-2021)	78	33,966
Private Schools (2019-2020)	23	2,277
Total	101	36,243

Source: National Center for Education Statistics 2020, 2021

Housing

The total number of housing units in Kitsap County in 2023 was 113,730, with 18,203 units (16.0 percent) within the City of Bremerton (Table 3.16-4). Vacant housing units totaled 7,972 in the county, of which 1,453 were in Bremerton. The rental vacancy rate was 4.1 percent countywide, 5.7 percent in Bremerton, and 3.7 percent in the State of Washington.

Table 3.16-4 Housing Data for Bremerton, Kitsap County, and the State of Washington

Area	*Total Housing Units*	*Vacant Housing Units*	*Rental Vacancy Rate*	*Median Value of Owner-Occupied Housing Units*	*Median Gross Rent*	*Persons per Household*
Bremerton	18,886	1,228	5.2 percent	$409,500	$1,535	2.3
Kitsap County	115,329	8,065	3.9 percent	$505,700	$1,741	2.5
State of Washington	3,262,667	242,109	4.3 percent	$519,800	$1,682	2.5

Source: U.S. Census Bureau 2023

Employment and Income

According to the U.S. Bureau of Labor Statistics for Kitsap County, there were 130,723 people in the labor force in April of 2022, with 5,218 unemployed, resulting in an unemployment rate of 4.0 percent (U.S. Bureau of Labor Statistics 2022a) (Table 3.16-5). This is a higher rate of unemployment than for the State of Washington as a whole, which was 3.5 percent.

Table 3.16-5 Employment in Kitsap County and the State of Washington (April 2022)

Employment Measure	*Kitsap County (April 2022)*	*State of Washington (April 2022)*
Civilian Labor Force	130,723	4,015,271
Employed	125,505	3,872,849
Unemployed	5,218	142,422
Unemployment Rate	4.0 percent	3.5 percent

Sources: U.S. Bureau of Labor Statistics 2022a, 2022b

Table 3.16-6 shows data from the U.S. Census Bureau (2023) reporting civilian employment by industry in Kitsap County and the State of Washington for 2023. The education services, health care, and social assistance sector was the largest civilian employment industry in Kitsap County with 24,203 employees (20.0 percent), while the professional, scientific, management, administrative, and waste management services sector accounted for 15,300 employees (12.6 percent) and was the second largest industry in the county (U.S. Census Bureau 2023). Educational services, health care, and social assistance comprised the largest employment industry in the State of Washington as well, accounting for 21.4 percent of employment (810,352 employees).

Table 3.16-6 Civilian Employment by Industry in Kitsap County and Washington 2023

Industry	*Kitsap County Employment*	*Kitsap County - Percent of Total Workforce*	*State of Washington Employment*	*State of Washington - Percent of Total Workforce*
Agriculture, forestry, fishing and hunting, and mining	951	0.8	94,411	2.5
Construction	8,583	7.1	272,516	7.2
Manufacturing	13,890	11.5	346,038	9.2
Wholesale trade	1,692	1.4	88,526	2.3
Retail trade	14,801	12.2	438,325	11.6
Transportation and warehousing, and utilities	5,682	4.7	217,506	5.8
Information	1,806	1.5	93,763	2.5
Finance and insurance, and real estate and rental and leasing	5,459	4.5	201,157	5.3
Professional, scientific, and management, and administrative and waste management services	15,300	12.6	547,526	14.5

Industry	Kitsap County Employment	Kitsap County - Percent of Total Workforce	State of Washington Employment	State of Washington - Percent of Total Workforce
Educational services, and health care and social assistance	24,203	20.0	810,352	21.4
Arts, entertainment, and recreation, and accommodation and food services	10,889	9.0	317,319	8.4
Other services, except public administration	5,004	4.1	165,046	4.4
Public administration	12,891	10.6	188,847	5.0

Source: U.S. Census Bureau 2023

According to the U.S. Census Bureau (2023), median household income in Kitsap County was $98,546 in 2023, mean household income was $125,517, and per capita income was $50,367 (Table 3.16-7). Median household income was higher in Kitsap County than in the City of Bremerton or the State of Washington as a whole, but mean household income, median earnings for workers, and per capita income were all higher in the state as a whole.

Table 3.16-7 Income Data for Bremerton, Kitsap County, and the State of Washington 2023

Area	Median Household Income	Mean Household Income	Median Earnings for Workers	Per Capita Income
Bremerton	$74,399	$93,011	$41,599	$40,201
Kitsap County	$98,546	$125,517	$51,484	$50,367
State of Washington	$94,952	$129,559	$52,247	$51,493

Source: U.S. Census Bureau 2023

Economic Activity

Table 3.16-8 lists the total gross product for Kitsap County and the State of Washington by industry. Gross product is the total value of all the goods and services produced in a particular year. Total gross county product for Kitsap County and gross state product for the State of Washington were roughly $13.4 billion and $667.6 billion, respectively. The largest contributor to gross state product in the State of Washington is the information industry, which contributes roughly $111.4 billion in economic output. Government and government enterprises comprise the largest contributing industry in Kitsap County, contributing $5.6 billion.

Table 3.16-8 Gross Product for Kitsap County and the State of Washington

Industry	Kitsap County (2020)	State of Washington (2021)
Agriculture, forestry, fishing, and hunting	$34,539,000	$9,946,300,000
Mining, quarrying, and oil and gas extraction	$5,484,000	$664,300,000
Utilities	$25,209,000	$5,127,900,000
Construction	$560,710,000	$29,021,100,000
Manufacturing	$297,666,000	$57,434,600,000

Industry	*Kitsap County (2020)*	*State of Washington (2021)*
Wholesale trade	$199,057,000	$34,980,400,000
Retail trade	$748,360,000	$68,201,500,000
Transportation and warehousing	$63,154,000	$14,412,800,000
Information	$259,409,000	$111,376,600,000
Finance, insurance, real estate, rental, and leasing	$2,810,907,000	$109,560,300,000
Professional and business services	$1,208,641,000	$73,078,200,000
Educational services, healthcare, and social assistance	$928,320,000	$42,608,600,000
Arts, entertainment, recreation, accommodation, and food services	$402,832,000	$19,728,800,000
Other services (except government and government enterprises)	$276,738,000	$11,772,700,000
Government and government enterprises	$5,628,757,000	$79,662,800,000
All Industry Total	$13,449,783,000	$667,576,900,000

Sources: Bureau of Economic Analysis 2020, 2021

State and Local Tax Revenues

Total tax and license revenue is shown for the State of Washington and Kitsap County in Table 3.16-9. The largest sources of tax revenues at the state and county level are the property tax and the sales tax. Specifically, the largest source of tax revenue for the county is property taxes and the largest source of tax revenue at the state level is the sales tax.

Table 3.16-9 Tax Revenues for Kitsap County and the State of Washington

Tax	*Kitsap County (2020)*	*State of Washington (2019)*
Property Tax	$63,429,263	$3,358,585,000
Sales Tax	$30,723,772	$21,373,727,000
Other Tax	$40,562,974	$2,424,050,000
Licenses and Permits	$5,889,499	$836,075,000
Total	$140,605,508	$27,992,437,000

Sources: U.S. Census Bureau 2019; Kitsap County 2022

3.16.2.2 Effects Associated with Reasonably Foreseeable Future Actions

Tables 3.16-10 and 3.16-11 summarize the potential effects to socioeconomics associated with RFFAs with a close causal relationship to the project at NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor.

Table 3.16-10 Effects to Socioeconomics from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bremerton

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy –Pier 3 Electrical Substation Repair, PSNS & IMF	The project would fall within the socioeconomics ROI of Kitsap County.	The project's construction spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for construction workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
		costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy – Marine Structure Maintenance and Pile Replacement Activities, PSNS & IMF and NAVBASE Kitsap-Manchester	The project would fall within the socioeconomics ROI of Kitsap County.	The project's construction spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for construction workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy – Manchester Tank Farm Improvements, NAVBASE Kitsap-Manchester	The project would fall within the socioeconomics ROI of Kitsap County.	The project's construction spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for construction workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy – SIOP, PSNS & IMF	The project would fall within the socioeconomics ROI of Kitsap County.	The project's construction spending would be beneficial to the socioeconomics ROI. The large scale and long duration of the project would stimulate economic growth for supplier and support businesses which would increase employment and income in Kitsap County. Adverse effects may occur due to increased demand for construction workers, which would raise the possibility of requiring workers from outside the local area. The long duration of the project may increase the likelihood of workers relocating to the area and may increase demand for schools and housing in the ROI. Higher demand may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities. Economic growth in the ROI and increased employment and wages would increase tax revenues which would help offset increased burdens on schools and infrastructure.
Navy – OU B Marine Source Removal Actions	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy – NAVBASE Kitsap-Manchester CERCLA actions for PFAS	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy – OU A, OU B Terrestrial, and Operable Unit NSC CERCLA actions for PFAS	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
City of Bremerton – 6th Street Pavement Preservation Project Phase III	The project would fall within the socioeconomics ROI of Kitsap County.	The project's construction spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for construction workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
City of Bremerton – Naval Avenue Bicycle and Pedestrian Enhancement	The project would fall within the socioeconomics ROI of Kitsap County.	The project's construction spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for construction workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Port of Bremerton - Marina Breakwater Replacement, Port Orchard Marina	The project would fall within the socioeconomics ROI of Kitsap County.	The project's construction spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for construction workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Private Development – The Beacon and Beacon II	The project would fall within the socioeconomics ROI of Kitsap County.	The project's construction spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for construction workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Private Development – McWilliams Apartments	The project would fall within the socioeconomics ROI of Kitsap County.	The project's construction spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for construction workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; Navy = U.S. Department of the Navy; OU = Operable Unit; PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility; PFAS = per and polyfluoroalkyl substances; ROI = Region of Influence; SIOP = Shipyard Infrastructure Optimization Program

Table 3.16-11 Effects to Socioeconomics from Reasonably Foreseeable Future Actions at NAVBASE Kitsap-Bangor

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy - Transit Protection Program Pier and Support Facilities	The project would fall within the socioeconomics ROI of Kitsap County.	The project's construction spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for construction workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy - Child Development Center	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy - Military Working Dog Kennel Replacement	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy - Repair Substation 5	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy - Tang Road Repair	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy - Equipment Processing Building	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy - Relocate Flier Road	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy – CERCLA actions for PFAS	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy – CERCLA Operable Unit 1 Site A	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.

Reasonably Foreseeable Future Actions	*Geographic Overlap*	*Influence on Resource*
Navy – CERCLA Operable Unit 2 Site F	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.
Navy – Alternate Power Transmission Line	The project would fall within the socioeconomics ROI of Kitsap County.	Project-related spending would be beneficial to the socioeconomics ROI. Adverse effects may occur due to increased demand for workers, which would raise the possibility of requiring workers from outside the local area and may increase demand for schools and housing in the ROI. This may increase the costs of construction and housing in the ROI and may stress class sizes and school capacities.

Legend: CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; Navy = U.S. Department of the Navy; OU = Operable Unit; PFAS = per and polyfluoroalkyl substances; ROI = Region of Influence

3.16.3 Environmental Consequences

Analysis of impacts to socioeconomics focuses on the effects of the alternatives on population, schools, housing, employment and income, economic activity, and state and local tax revenue.

3.16.3.1 Impact Assessment Methodology

This section describes the methods used to analyze impacts related to population, schools, housing, employment and income, economic activity, and state and local tax revenues. Impacts to population, schools, and housing are estimated using projections for the size of construction and operational workforces for each alternative as well as additional estimates for the number of workers that may move to the area as a result of the project. Impacts to employment and income, economic activity, and state and local tax revenues are estimated using projected construction and operational expenditures in the ROI and are modeled using the Impact Analysis for Planning software and data sets to simulate primary and secondary impacts in Kitsap County. Impacts on population, schools, and housing are estimated using the maximum demand at the peak of construction. Impacts on county economic activity and state and local tax revenues are estimated as the average annual impact during the construction period. For Alternatives 2 and 3, construction impacts are estimated to occur over 15 years. Further information on the socioeconomics methodology and the Impact Analysis for Planning modeling results are located in Appendix P.

3.16.3.2 Impact Analysis for Alternative 1: No-Action

Under Alternative 1, the Proposed Action would not proceed and there would be no changes to the socioeconomic conditions in the ROI other than changes associated with the reasonably foreseeable future actions described in Tables 3.16-10 and 3.16-11. Those changes include beneficial construction spending and potential adverse effects such as increased demand for schools and housing.

3.16.3.3 Impact Analysis for Alternative 2 (Preferred Alternative)

Construction-related Impacts

Table 3.16-12 summarizes socioeconomic impacts that would occur during construction of Alternative 2.

Table 3.16-12 Socioeconomic Impacts in the ROI during Construction of Alternative 2

Impact	*Baseline Value*	*Change During Alternative 2 (Preferred Alternative) Construction*	*Percentage Change from Baseline*
Population in ROI	276,581	Peak increase of 285	0.1
School Population in ROI	36,243	46 new students	Less than 0.2
Vacant Housing Units	8,065	Peak demand of 114 units	-1.4
Kitsap County Employment	125,505	1,214 total jobs per year	1.0
Kitsap County Labor Income	$9,493,053,822	$76,380,753 per year	0.8
Kitsap County Gross County Product	$13,449,783,000	$89,201,020 per year	0.7
Kitsap County Tax Revenue	$140,605,508	$316,163 per year	0.2
Washington State Tax Revenue	$27,992,437,000	$1,739,295 per year	Less than 0.1

Legend: ROI = Region of Influence.

Population

The peak construction workforce under Alternative 2 would be two work shifts, each with a maximum of 1,000 on-site workers. A large portion of the workforce is estimated to come from outside the ROI. However, large population centers in Seattle and Tacoma that could supply construction workers would be within commuting distance of the project area. The temporary nature of construction jobs makes it less likely that workers will relocate to the ROI. Work on the forge shop at NAVBASE Kitsap-Bangor would last for up to 3 years and would include slightly longer commuting distances for most workers. This may increase the likelihood of workers temporarily relocating or occasionally seeking temporary lodging in the ROI for this portion of the project, but this would still fall within the commuting distance of a significant supply of construction workers. Therefore, it is unlikely that large numbers of nonlocal workers would relocate to the ROI during construction. The transportation analysis in Section 3.12 estimates construction worker trip origins based on worker profiles from several Seattle construction projects. The analysis concludes that 7.5 percent of workers would come from northern Kitsap County and that 7.5 percent of workers would come from southern Kitsap and Mason Counties (see Table 3.12-7). Based on the ratio of population in Kitsap County south of Sinclair Inlet and Mason County, it is estimated that 3.9 percent of workers would come from Kitsap County south of Sinclair Inlet for a total of 11.4 percent of workers coming from inside Kitsap County and 88.6 percent of workers coming from outside the county. For a conservative estimate, it is assumed that these 11.4 percent of workers in Kitsap County are new to the county and would relocate to the area during construction. At the peak of construction, which is estimated to include 1,000 on-site workers, this would total 114 workers moving to the ROI. The average household size in Washington is 2.5 people (see Table 3.16-4). If each worker brought an average sized family with them, the total population increase would be 285 people, or approximately a 0.1 percent increase from the baseline.

Population growth from relocating workers and their families would increase demands on housing and public services such as schools, health and safety services, and roads. This would be a minor permanent (the estimated 114 relocated workers and their families are assumed to permanently move to the ROI) adverse impact. Population growth from relocating workers and their families would stimulate economic activity and increase tax revenues through income and spending. This would be a minor permanent beneficial impact.

Schools

An increase in the number of students would impose costs on the local school district as they would be responsible for providing educational services for those children. According to data from the U.S. Census Bureau (2023) there was an average of 0.4 school-aged children (K-12) per household in the State of Washington in 2023. Therefore, this analysis assumes that for each of the 114 workers who relocate to the ROI during construction, there would be an additional 0.4 child that would enroll in the local school system. This would equate to a total of 46 students at the peak of construction which would be an increase in the number of students in the ROI of less than 0.2 percent. This would be a minor permanent adverse impact.

Housing

As a conservative estimate, the present analysis assumes that each of the 114 workers who would relocate to the ROI at the peak of construction would require one housing unit. The 114 housing units would equate to 1.4 percent of the total vacant housing units in the ROI. The increase in the demand for housing would reduce the amount of available housing and may contribute to an increase in housing prices and rental rates. This would be a minor permanent adverse impact.

Employment and Income

The Proposed Action will require an on-site workforce. In addition, local businesses may hire more workers to support the construction effort or provide services to construction workers. An estimated 1,214 direct, indirect, and induced jobs per year would be supported in the ROI during the 15 years of construction. Labor income supported by construction activities would total approximately $76.4 million per year (see Appendix P). The increased jobs and labor income in the ROI would be a moderate temporary beneficial impact.

Economic Activity

Construction spending and hiring in the ROI would increase the total gross product in the county. During the 15 years of construction there would be an estimated increase of $89.2 million per year. The stimulated local economy would be a moderate temporary beneficial impact.

State and Local Taxes

Spending in the ROI would stimulate tax revenues, including an estimated $1.7 million per year to the State of Washington and $316,163 per year to Kitsap County. The increase in tax revenues would be a moderate temporary beneficial impact.

Operation-related Impacts

Under Alternative 2, operation of the forge shop would be relocated from NAVBASE Kitsap-Bremerton to NAVBASE Kitsap-Bangor. Additional changes associated with the reasonably foreseeable future actions are described in Tables 3.16-11 and 3.16-12. These include beneficial construction spending and potential adverse effects such as increased demand for schools and housing. While the relocation of the forge shop may shift a small amount of economic activity away from the City of Bremerton, operational employment and local expenditures within Kitsap County are expected to remain similar to current levels after construction of the Proposed Action is complete.

Effects Associated with Reasonably Foreseeable Future Actions

As described in Tables 3.16-10 and 3.16-11, several other projects would compound the impacts associated with construction of the Proposed Action. Socioeconomic impacts would generally be beneficial through increasing spending and employment within the ROI, which would help offset associated increased demands on public services and infrastructure. After construction is complete, operational employment and local expenditures within Kitsap County are expected to remain similar to current levels.

3.16.3.4 Impact Analysis for Alternative 3

Construction-related Impacts

Table 3.16-13 summarizes socioeconomic impacts that would occur during construction of Alternative 3.

Table 3.16-13 Socioeconomic Impacts in the ROI during Construction of Alternative 3

Impact	*Baseline Value*	*Change During Alternative 3 Construction*	*Percentage Change from Baseline*
Population in ROI	276,581	Peak increase of 285	0.1
School Population in ROI	36,243	46 new students	Less than 0.2
Vacant Housing Units	8,065	Peak demand of 114 units	-1.4
Kitsap County Employment	125,505	1,372 total jobs per year	1.1
Kitsap County Labor Income	$9,493,053,822	$86,215,529 per year	0.9
Kitsap County Gross County Product	$13,449,783,000	$101,035,765 per year	0.8
Kitsap County Tax Revenue	$140,605,508	$379,447 per year	0.3
Washington State Tax Revenue	$27,992,437,000	$2,052,263 per year	Less than 0.1

Legend: ROI = Region of Influence

In general, impacts under Alternative 3 would be similar to those described for Alternative 2. Under Alternative 3, construction activities would last for up to 15 years. The peak construction workforce is estimated to be the same as under Alternative 2, which results in the maximum impact estimates for population, schools, and housing all being the same.

Employment, income, and domestic product all have a slightly larger beneficial impact per year. Tax revenues generated under Alternative 3 would be higher per year ($63,284 increase for Kitsap County tax revenue and $312,968 increase for Washington State tax revenue) compared to Alternative 2.

Operation-related Impacts

No operation-related impacts are expected under Alternative 3 other than changes associated with the reasonably foreseeable future actions described in Tables 3.16-10 and 3.16-11. Operational employment and local expenditures are expected to remain similar to current levels after construction of the Proposed Action is complete.

Effects Associated with Reasonably Foreseeable Future Actions

Impacts under Alternative 3 would be identical to Alternative 2 regarding effects associated with reasonably foreseeable future actions.

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3.17 Summary of Potential Impacts to Resources Analyzed by Alternative

Table 3.17-1 Summary of Potential Impacts to Resources Analyzed by Alternative

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
3.2 Air Quality	The Proposed Action would not occur; therefore, the proposed M2D2 would not be built, Pier 4 would not be replaced, and other component actions would not occur. However, the Navy would continue to maintain, repair, and operate existing facilities. RFFAs could cause temporary increases in criteria pollutants, HAPs, and GHGs emitted due to short-term construction but there would be no long-term changes to air quality. Therefore, no impacts would be anticipated with implementation of the no-action alternative.	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap Bangor** Construction activities would generate emissions of criteria pollutants and GHGs from in-water and upland construction activities. Emissions would be highest in 2028 and 2029, when construction of the M2D2 at DD3 would coincide with the construction of Pier 2. GHG emissions generated from the Proposed Action activities would contribute to the global atmosphere, regardless of the specific location within the ROI that they are produced. Alternative 2 would generate direct GHG emissions of approximately 473,290 tons of CO_2e between 2027 and 2041. Indirect GHG emissions would result from changes in energy use from other systems, but an overall decrease in indirect GHG emissions is expected because new systems would be more energy efficient. Application of BMPs BREM AQ-1 through AQ-5 and BANGOR AQ-1 through AQ-5 would reduce emissions and thus reduce pollutant concentrations at any given location. Emissions under Alternative 2 would not cause a violation of the NAAQS or appreciably increase health risks to the public. The facilities constructed under Alternative 2, including those at NAVBASE Kitsap-Bangor, would be more energy efficient than the buildings they replaced. The forge shop would	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Construction activities would generate emissions of criteria pollutants and GHGs from in-water and upland construction activities. Emissions would be highest in 2028, during demolition of the existing Mooring A and associated building demolition, followed by 2035, during construction of the M2D2 at Mooring A. Direct GHG emissions from all years of construction under Alternative 3 (2027 to 2041) would be slightly higher than those from Alternative 2, at 478,982 tons of CO_2e. Application of BMPs BREM AQ-1 through AQ-5 and BANGOR AQ-1 through AQ-5 would reduce emissions and thus reduce pollutant concentrations at any given location. PSCAA. Emissions under Alternative 3 would not cause a violation of the NAAQS or appreciably increase health risks to the public. Operation-related impacts under Alternative 3 are the same as impacts under Alternative 2, with the exception that there would be no changes to the forge shop under Alternative 3. Similar to Alternative 2, the facilities constructed under Alternative 3 would be

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		also be an operational increase at NAVBASE Kitsap-Bangor. The emissions would not be different from those occurring at NAVBASE Kitsap-Bremerton but would simply change locations. Other indirect GHG emissions would result from changes in energy use from other systems, but an overall decrease in indirect GHG emissions is expected because new systems would be more energy efficient. Impacts from operational activities are not expected to interfere with the attainment of NAAQS or increase human health risks from HAP exposure in areas where sensitive receptors and/or public presence are expected.	more energy efficient than the buildings they replaced. Other indirect GHG emissions would result from changes in energy use from other systems, but an overall decrease in indirect GHG emissions is expected because new systems would be more energy efficient. Impacts from operational activities are not expected to interfere with the attainment of NAAQS, as the ambient criteria pollutant concentrations in the region are well below the NAAQS. No increase in human health risks is expected from HAP exposure in areas where sensitive receptors and/or the public are located.
3.3 Water Resources	The Proposed Action would not occur; therefore, there would be no project-related or operations-related effects on water resources. With implementation of other projects, overall improvement to marine water quality would occur due to the positive long-term impact of removing creosote-treated piling and structures and contaminated sediment from Sinclair Inlet.	**NAVBASE Kitsap-Bremerton** Management, treatment, and discharge of groundwater and stormwater to Sinclair Inlet during construction would be in compliance with a construction stormwater NPDES permit. BMPs would be implemented to reduce impacts to water quality and to wetlands and shorelines. Dredging and disposal of dredged material would be conducted in accordance with federal, state, and local regulations and the permitting process for in-water projects. None of the modeled activities resulted in the exceedance of the state of Washington's turbidity water quality criteria for aquatic life at the 150-foot compliance boundary. Maximum predicted total suspended solids	**NAVBASE Kitsap-Bremerton** Management, treatment, and discharge of groundwater and stormwater to Sinclair Inlet and dredging operations would be the same as described for Alternative 2. The Navy would implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under CWA Section 404 and Rivers and Harbors Act Section 10 permit, and Ecology's CWA Section 401 Water Quality Certification. The addition of M2D2 would increase the amount of process water at PSNS & IMF by approximately 33 percent. Management, treatment, and discharge of stormwater, process water, and saltwater cooling effluent during operations would be in compliance with the applicable NPDES

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		(TSS) levels for some pile related activities are higher than for dredging; however, the peaks are brief and TSS disperses rapidly from the pile-related activities. The waterfront improvements involving dredge/fill, in-water demolition, and construction (pile removal and installation); and placement of riprap along underwater dredged slopes for new Pier 2 would result in temporary and permanent impacts to waters of the U.S. within Sinclair Inlet. The Navy would implement compensatory mitigation actions to mitigate for losses to aquatic resources as required under CWA Section 404 and Rivers and Harbors Act Section 10 permit, and Ecology's CWA Section 401 Water Quality Certification. The addition of M2D2 would increase the amount of process water at PSNS & IMF by approximately 16 percent. Management, treatment, and discharge of groundwater, stormwater, process water, and saltwater cooling effluent during operations would be in compliance with applicable CWA permits. BMPs would be implemented to reduce impacts to water quality. The new outfall and diffuser would be located and configured to address potential localized impacts to ambient water quality. Development of proposed facilities at NAVBASE Kitsap-Bremerton would result in a net gain of up to 354,500 square feet of	permit and State Waste Discharge Permit. BMPs would be implemented to reduce impacts to water quality. Development of proposed facilities at NAVBASE Kitsap-Bremerton would result in a net gain of up to 433,000 square feet of impervious surface. As described for Alternative 2, new stormwater infrastructure would reduce the potential for migration of contaminated soil and groundwater to the marine environment and would be consistent with the remedial action objectives identified in the OU B Terrestrial ROD and result in a positive improvement to water resources. **NAVBASE Kitsap-Bangor** Construction at NAVBASE Kitsap-Bangor would be in compliance with measures identified in the Wellhead Protection Plan, including any activities within established wellhead protection areas. The construction at NAVBASE Kitsap-Bangor would result in a net gain of 652,000 square feet of impervious surface. Through compliance with the NAVBASE Kitsap-Bangor's coverage under EPA's Construction General Permit if construction is greater than 1 acre, as well as UFC 3-210-10, LID and EISA Section 438, there would be a reduction in stormwater pollutant loading potential and thus a reduction in pollution

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		impervious surface, resulting in a minor increase in stormwater runoff. New storm drainage would provide additional capacity for the minor increase in stormwater runoff. This would reduce the potential for migration of contaminated soil and groundwater to the marine environment and would be consistent with the remedial action objectives identified in the OU B Terrestrial ROD and result in a positive improvement to water resources. With implementation of construction BMPs and compliance with applicable CWA permits, short-term adverse effects to marine waters from construction of the Proposed Action are not expected. In addition, dredging and offsite disposal of dredged material that exceeds the DMMP screening levels would improve localized water quality and surface sediment quality conditions in the project area. **NAVBASE Kitsap-Bangor** Construction of the forge shop at NAVBASE Kitsap-Bangor is expected to require excavation of 14 feet and may encounter groundwater. If encountered during construction, groundwater would be managed in compliance with the NPDES Construction Stormwater General Permit. Construction at NAVBASE Kitsap-Bangor would be in compliance with measures identified in the Wellhead Protection Plan, including any activities within established wellhead protection areas. Construction at NAVBASE	loading potential to groundwater and nearby surface waters and wetlands.

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		Kitsap-Bangor would not be located in floodplains or wetland areas. The construction at NAVBASE Kitsap-Bangor would result in a net gain of 872,000 square feet of impervious surface. Through compliance with the NAVBASE Kitsap-Bangor's coverage under EPA's Construction General Permit if construction is greater than 1 acre, as well as UFC 3-210-10, LID and EISA Section 438, impacts would be minimized to groundwater and nearby surface waters and wetlands.	
3.4 Geological Resources	The Proposed Action would not occur, and there would be no effects to topography, soil, bathymetry, and marine sediment. Without upgrades to meet current seismic standards, most of the dry docks, piers, and wharves at PSNS & IMF are expected to perform poorly in seismic events.	**NAVBASE Kitsap-Bremerton** The proposed demolition, construction, and modification of upland facilities would result in minimal changes to topography. Approximately 896,250 cubic yards of excavation and 484,000 cubic yards of fill above MHHW would occur. Changes to drainage patterns would be managed with stormwater construction BMPs. Installation of temporary retaining structures would stabilize shorelines and reduce the potential for slope failure during construction. The design and construction of all new structures and facilities would be in compliance with current DoD UFC. The design and construction of dry docks will be consistent with the seismic design criteria DoD safety certification program – MIL-STD-1625D (SH) and DoD UFC. This would minimize the potential effects of seismically induced	**NAVBASE Kitsap-Bremerton** Impacts to topography, geology, soils, bathymetry, and marine sediment would be similar to those described for Alternative 2. Alternative 3 would involve less excavation than Alternative 2, with 713,000 cubic yards of excavation, but increased fill with approximately 694,000 cubic yards of fill above MHHW. Installation of temporary retaining structures would stabilize shorelines and reduce the potential for slope failure during construction. Proposed seismic upgrades would reduce the risk of impacts due to seismically induced liquefaction and landslides. Alternative 3 would involve more dredging than Alternative 2, with removal of 1,651,000 cubic yards of marine sediment across 69 acres. Changes to bathymetry as a result of dredging would be minimal and the

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		ground movement, such as severe shaking, slope failure, and liquefaction. Dredging for new construction would result in removal of 867,450 cubic yards of marine sediment across approximately 37 acres, resulting in long-term beneficial effects to benthic organisms and marine life by reducing the volume of contaminated sediment and surface sediment contaminant concentrations. Changes to bathymetry as a result of dredging would be minimal and the seafloor topography would remain relatively flat, consistent with existing conditions. To minimize the short-term potential for increased erosion and sedimentation during construction, the Navy would implement appropriate erosion control BMPs in accordance with a project-specific construction SWPPP and in compliance with coverage provisions under the construction stormwater NPDES permit. The Navy would implement BMPs during dredging and in-water construction activities to minimize the generation of suspended sediment as well as sediment transport. Based on a project-specific sediment transport study (Appendix H), turbidity impacts associated with dredging and marine demolition and construction activities are not expected to exceed applicable water quality criteria.	seafloor topography would remain relatively flat, consistent with existing conditions. To minimize the short-term potential for increased erosion and sedimentation during construction, the Navy would implement appropriate erosion control BMPs in accordance with a project-specific construction SWPPP and in compliance with coverage provisions under the construction stormwater NPDES permit. The Navy would implement BMPs during dredging and in-water construction activities to minimize the generation of suspended sediment as well as sediment transport. Based on a project-specific sediment transport study (Appendix H), turbidity impacts associated with dredging and marine demolition and construction activities are not expected to exceed applicable water quality criteria. There would be no additional permanent or long-term disturbance of topography, geology, soil, bathymetry, or marine sediment following construction. Installation of new quay walls, sheet pile walls, and riprap would improve shoreline stability and reduce the potential for migration of contaminated soil to the marine environment. Proposed seismic upgrades would reduce the risk of impacts due to seismically induced liquefaction and landslides.

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		There would be no additional permanent or long-term disturbance of topography, geology, soil, bathymetry, or marine sediment following construction. Installation of new quay walls, sheet pile walls, and riprap would improve shoreline stability and reduce the potential for migration of contaminated soil to the marine environment. Proposed seismic upgrades would reduce the risk of impacts due to seismically induced liquefaction and landslides. **NAVBASE Kitsap-Bangor** Construction activities associated with the Radio Hill complex expansion and forge shop at NAVBASE Kitsap-Bangor would include clearing, grading, excavating, and filling. Some of the areas have been previously disturbed and are level. Slopes at the Radio Hill complex expansion area would be stabilized by constructing retaining walls behind the two new buildings (employee building and work building) and terracing would likely be required at the new storage area. The design and construction of all new structures and facilities would be in compliance with current DoD UFC. To minimize the short-term potential for increased erosion and sedimentation during construction, the Navy would implement appropriate erosion control BMPs in accordance with a project-specific construction SWPPP and in compliance with	**NAVBASE Kitsap-Bangor** Impacts to topography, geology, and soils would be similar to those described for Alternative 2 but with reduced impacts under Alternative 3 without the construction of the forge shop. Retaining walls and terracing would stabilize slopes at the Radio Hill complex expansion area. To minimize the short-term potential for increased erosion and sedimentation during construction, the Navy would implement appropriate erosion control BMPs in accordance with a project-specific construction SWPPP and in compliance with coverage provisions under the NPDES construction stormwater general permit. There would be no additional permanent or long-term disturbance of topography, geology, or soil following construction. Retaining walls and terracing would stabilize slopes at the Radio Hill complex expansion. Because all new structures would adhere to seismic design criteria identified in the appropriate DoD UFC(s), there would be a decrease in the probability of facility damage from a seismic event.

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		coverage provisions under the NPDES construction stormwater general permit. There would be no additional permanent or long-term disturbance of topography, geology, or soil following construction. Retaining walls and terracing would stabilize slopes at the Radio Hill complex expansion. Because all new structures would adhere to seismic design criteria identified in the appropriate DoD UFC(s), there would be a decrease in the probability of facility damage from a seismic event.	
3.5 Biological Resources	The Proposed Action would not occur; therefore, there would be no project-related or operations-related effects on biological resources. With implementation of other projects, overall improvement to marine water quality and associated aquatic wildlife habitat would occur due to the positive long-term impact of removing creosote-treated piling and structures and contaminated sediment from Sinclair Inlet. Biological resources would be affected by potential impacts of natural hazards.	**NAVBASE Kitsap-Bremerton** Use of a temporary barge-mounted saltwater intake and pump system while the new saltwater cooling distribution system is being constructed would meet Best Technology Available (BTA), as defined in CWA Section 316(b) (40 CFR 125 Subpart J) and intake structures would be designed to minimize impacts to marine organisms, including juvenile salmonids and marine mammal prey species, from entrainment. This system will also comply with PSNS & IMF NPDES permitting requirements for saltwater cooling effluent discharges into Sinclair Inlet. Installation of temporary mooring buoys and corresponding increase in moored construction barges where they do not currently occur would result in localized and short-term turbidity during mooring install, overwater shade from the barges while	**NAVBASE Kitsap-Bremerton** Impacts from use of a temporary barge-mounted saltwater intake and pump system and installation and use of up to 18 temporary mooring buoys would be the same as described under Alternative 2. Demolition, Construction, and Operations ROI – same duration of activity as Alternative 2 (15 years) and would implement BMPs to minimize impacts. Dredging and demolition would result in more vegetation and benthic invertebrates removed and a net increase in overwater coverage as compared to Alternative 2. Dredging and demolition would also result in a long-term improvement to benthic habitat and EFH through removal of creosote-treated timbers and contaminated sediment, but more fill would be required as compared to Alternative 2 and would not be an increase in improved habitat.

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		moored, and increased construction-related night lighting for up to 15 years. Lighting and shade would not be permanent, as conditions would be returned to pre-existing with removal of moorings and construction barges. Demolition, Construction, and Operations ROI – Impacts to wildlife include airborne and in-water noise, water quality degradation through turbidity, suspended sediment, and contaminated sediment, temporary displacement of forage fish, fish entrainment, nearshore barriers, overwater shading, and overwater lighting that would occur over a duration of up to 15 years. During construction, the project would comply with water quality standards through a project-specific water quality monitoring and protection plan, including a compliance radius of 150 feet from work location. BMPs such as in-water work conducted within the allowable in-water work window, in-water noise attenuation through use of a bubble curtain around steel pipe piles during impact pile driving, and monitoring for marbled murrelets and marine mammals with implemented shutdown zones would minimize impacts. Dredging and demolition would result in a loss of marine vegetation and benthic invertebrates but would also result in a long-term improvement to benthic habitat and EFH through removal of creosote-treated timbers and potentially contaminated sediment.	The new dry dock and piers would be an increase in over-water coverage (5.47 acres) and over-water lighting at night which would result in impacts to salmonid migrations (delayed timing), increased energy expenditure, and increased risk of predation. These structures are not expected to significantly impact birds or marine mammals. **NAVBASE Kitsap-Bangor** Only Radio Hill complex would be expanded and would result in less vegetation removal than under Alternative 2.

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		Potential adverse impacts from vessel strike or disturbance to benthic environment from vessel traffic and associated night lighting. BMPs during vessel operations/transits would be implemented to minimize impacts to aquatic species. The new dry dock and piers would be an increase in over-water coverage (1.37 acres) and over-water lighting at night which would result in impacts to salmonid migrations (delayed timing), increased energy expenditure, and increased risk of predation. These structures are not expected to significantly impact birds or marine mammals. The new outfall and diffuser would result in localized impacts to federally managed fishes and habitat but would be located and configured to address potential localized impacts to ambient water quality. The Navy is consulting with NMFS on impacts to marine mammals, and consulting with both NMFS and USFWS on impacts to ESA-listed species and designated critical habitat occurring within the Demolition, Construction, and Operations ROI, Contractor Multi-Use Site(s) Transit Routes ROI, and Caisson Delivery Transit Route ROI. The Navy is also consulting with NMFS on impacts to EFH within the Demolition, Construction, and Operations ROI.	

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		NAVBASE Kitsap-Bangor *Radio Hill complex expansion and new forge shop* - existing vegetation and habitat for birds (including ESA-listed marbled murrelet), and terrestrial mammals would be replaced with a new forge shop and associated structures as well as new pavement and associated structures for the Radio Hill complex expansion. Clearing and increased human activity during construction would result in loss of habitat that may affect ESA-listed marbled murrelet. The Navy is consulting with USFWS for potential impacts to marbled murrelet within the NAVBASE Kitsap-Bangor Construction and Operations ROI.	
3.6 Cultural Resources	The Proposed Action would not occur; therefore, there would be no project-related or operations-related effects on cultural resources. Other Navy projects would demolish or alter cultural resources, or cultural resources may naturally deteriorate over time. Cultural resources would be affected by potential impacts of natural hazards.	**NAVBASE Kitsap-Bremerton** Alternative 2 includes the demolition of 17 historic properties. All 17 historic properties contribute to the PSNS Historic District, and 13 also contribute to the NHL. Construction would result in the removal of the historic Hammerhead Crane and fragments of rail systems that also contributes to the PSNS Historic District. Impacts would diminish the integrity of the NYPS NHL, PSNS Historic District, and Officers' Row Historic District. Pursuant to Section 106, adverse effects to historic properties would be resolved through consultation and implementation of a Memorandum of Agreement.	**NAVBASE Kitsap-Bremerton** Impacts would be similar to Alternative 2 but would include the demolition of 5 historic properties. All 5 historic properties contribute to the PSNS Historic District, 2 contribute to the NHL, and 1 is NRHP individually eligible. The new M2D2 would be constructed in the PSNS Historic District. Alterations to Moorings E, F, and G would not impact historic properties. **NAVBASE Kitsap-Bangor** Impacts would be the same as Alternative 2.

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		Demolition would alter the setting of the Officers' Row Historic District. For other NAVBASE-Kitsap-Bremerton historic properties and non-installation cultural resources, project actions would result in negligible impacts to the setting. Construction activities could disturb previously unidentified archaeological resources. Dredging activities would primarily occur in areas with deep fill and with low to moderate probability for presence of archaeological resources. Fill deposits may contain archaeological resources out of their original context, and construction activities that extend beyond the depth of fill would have a higher probability of encountering archaeological resources. Construction activities would follow the Navy's post-review discovery plan and comply with the MOA and BMPs. The Navy would conduct a cultural resources desktop analysis of previously disturbed offsite staging areas selected by the contractor. Short-term, construction-related impacts to cultural resources, such noise and vibration, are expected to be negligible. No operation-related impacts would occur to cultural resources. **NAVBASE Kitsap-Bangor** No impacts to known cultural resources would occur. Construction activities could disturb	

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		previously unidentified archaeological resources. Construction activities would follow the Navy's post-review discovery plan and comply with the MOA and BMPs.	
3.7 American Indian Traditional Resources	The Proposed Action would not occur; therefore, there would be no project-related or operations-related effects on American Indian Traditional Resources. American Indian Traditional Resources would be affected by potential adverse impacts from natural hazards and RFFAs	**NAVBASE Kitsap-Bremerton** Construction could impact the availability of traditional resources through habitat impacts, including vegetation removal and permanent overwater coverage. Availability and harvestability of traditional resources could be impacted due to injury and altered behavior from noise and water turbidity during construction. Removal of contaminated sediment and creosote-treated pilings would lead to improved water quality and surface sediment quality in localized areas, which would benefit traditional resources. Operation-related impacts are expected to be similar to existing baseline conditions, although the amount of process water used and surface area runoff would increase. The amount of water discharge into Sinclair Inlet from NAVBASE Kitsap-Bremerton would increase but would adhere to water quality standards. Noise and vessel traffic would increase during construction over baseline conditions and have the potential to interfere with Tribal fishing activities. Temporary mooring buoys could disrupt Tribal fishing.	**NAVBASE Kitsap-Bremerton** Construction could impact the availability of traditional resources through habitat impacts, including vegetation removal and permanent overwater coverage. Availability and harvestability of traditional resources could be impacted due to injury and altered behavior from noise and water turbidity during construction. Removal of contaminated sediment and creosote-treated pilings would lead to improved water quality and surface sediment quality in localized areas, which would benefit traditional resources. Operation-related impacts are expected to be similar to existing baseline conditions, although the amount of process water used and surface area runoff would increase. The amount of water discharge into Sinclair Inlet from NAVBASE Kitsap-Bremerton would increase but would adhere to water quality standards. Noise and vessel traffic would increase during construction over baseline conditions and have the potential to interfere with Tribal fishing activities. Temporary mooring buoys could disrupt Tribal fishing activities.

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		In the long-term, there could be beneficial effects to traditional resources if the Proposed Action results in long-term improvement to water and sediment quality from removal of contaminated sediment, and increased quantity and quality of traditional resources. Installation and operation of the permanent outfall and diffuser could permanently interfere with Tribal fishing in the location of structures. **NAVBASE Kitsap-Bangor** New permanent laydown areas would reduce the amount of forest land available for Tribal harvest at NAVBASE Kitsap-Bangor. Construction could impact traditional resources through vegetation removal and potential loss of gathering areas. Loss of vegetation and increased impervious surface area could also increase stormwater runoff but adverse impacts to water quality are not anticipated.	Construction is expected to be the same duration as Alternative 2 (15 years). Operation-related impacts are expected to be similar to existing baseline conditions with regard to noise and vessel traffic. In the long-term, there could be beneficial effects to traditional resources if the Proposed Action results in long-term improvement to water and sediment quality from removal of contaminated sediment, increased quantity and quality of traditional resources. **NAVBASE Kitsap-Bangor** New permanent laydown areas would reduce the amount of forest land available for Tribal harvest at NAVBASE Kitsap-Bangor. Construction could impact traditional resources through vegetation removal and potential loss of gathering areas. Loss of vegetation and increased impervious surface area could also increase stormwater runoff but adverse impacts to water quality are not anticipated
3.8 Land Use and Recreation	The Proposed Action would not occur; therefore, there would be no project-related or operations-related effects on land use and recreation. Land use and recreation would be affected by potential impacts of rising sea levels and associated storm surges due to natural hazards.	**NAVBASE Kitsap-Bremerton** There would be no impacts to land use at NAVBASE Kitsap-Bremerton from Alternative 2. Recreational fisheries for salmon, especially Chinook, and other fish in Sinclair Inlet would be impacted by the project related construction. Recreational fishers would face increased vessel traffic that could interfere	**NAVBASE Kitsap-Bremerton** There would be no impacts to land use at NAVBASE Kitsap-Bremerton from Alternative 3. Recreational fisheries for salmon, especially Chinook, and other fish will be impacted similar to Alternative 2. Similar to Alternative 2, there would be no operational impacts to recreation in Sinclair Inlet post construction.

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		with fishing activities, and noise from construction could result in behavioral changes that include fish leaving the area (construction, including in-water pile driving will be occurring during these fisheries). Post construction, there would be no operational impacts to recreation in Sinclair Inlet. There would be no impacts to land use and recreation in the City of Bremerton from implementation of Alternative 2. **NAVBASE Kitsap-Bangor** The proposed changes would be consistent with the current NAVBASE Kitsap-Bangor land use designations. There would be no impacts to recreation from implementation of Alternative 2. There would be no operational related impacts to land use or recreation from implementation of Alternative 2.	There would be no impacts to land use and recreation in the City of Bremerton from implementation of Alternative 3. **NAVBASE Kitsap-Bangor** The proposed changes would be consistent with the current NAVBASE Kitsap-Bangor land use designations. There would be no impacts to recreation from implementation of Alternative 3. There would be no operational related impacts to land use or recreation from implementation of Alternative 3.
3.9 Visual Resources	The Proposed Action would not occur. The Navy would continue to maintain, repair, and operate existing facilities. Views from the identified KOPs would remain the same though facilities would continue to age and uses may vary based on future needs. Therefore, under the no-action alternative, no new visual contrast and minor impacts to visual resources would occur.	**NAVBASE Kitsap-Bremerton** Given the industrial surroundings and the temporary nature of the construction work occurring only during discrete construction phases, there would be minimal impact on the scenic quality of the channel waters. Therefore, construction activities would have negligible impacts on visual resources from KOPs at a greater viewing distance from the PSNS & IMF (KOPs V1, V6, and V7), minor impacts at a closer viewing distance (KOPs V2, V4, and V5), and no impacts on visual resources at KOP 3.	**NAVBASE Kitsap-Bremerton** Under Alternative 3, the degree of visual construction-related impacts would be less than under Alternative 2 because there would be no construction of Pier 2, and no demolition of Piers 6 and 7. Additionally, a new forge shop would not be built. However, the Navy would construct a new parking garage at the corner of Charleston Boulevard and Farragut Street to replace surface parking that would be lost when new facilities are constructed on an existing surface parking lot. Similar to Alternative 2,

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		The Hammerhead Crane is a prominent visual feature due to its green color, its size, a large jib visible above the tree line, and a lattice structure that distinguishes it from the other structures in PSNS & IMF. It is visually prominent from KOPs V2, V3, and V5 and visible in the distance from KOPs V1, V4, and V6. With its removal, the loss of a prominent visual resource would lead to moderate to strong visual contrast at these KOPs, depending on the viewing angle and distance. Moderate to major impacts to visual resources would be caused by the loss of this historically prominent visual feature at KOPs V1 to V6. Because of the long viewing distance and viewing angle, the Hammerhead Crane is not visible from KOP V7. The new Pier 4 is not expected to result in any discernible changes to the viewshed or views from any of the KOPs. The new M2D2 would be visually prominent from KOP V2; visible in the distance from KOPs V1, V4, V5, and V6; would not be visible from KOP V3 as it would be hidden by deciduous trees and vegetation in the foreground; and would not be visible from KOPs 7 and 8 due to the viewing distance and viewing angle. Using colors like those on existing facilities in the shipyard would help minimize visual contrast and allow the structure to better blend into the surroundings.	construction activities would have negligible to minor impacts on visual resources. Under Alternative 3, the degree of visual impacts would be similar but slightly less than under Alternative 2 because there would be no construction of Pier 2, no demolition of Piers 6 and 7, and fewer facilities demolished. Visual impact from deconstruction and removal of the Hammerhead Crane would be the same as Alternative 2. Similar to Alternative 2, the new M2D2 provides a facility for the USS Gerald R. Ford-class carrier(s). The new M2D2 and Wharf 2 under Alternative 3 would be visible in the distance from KOPs V1, V4, V5, V6, and V7; would be barely discernible from KOP 2; and would not be visible from KOP V3 because of the deciduous trees and vegetation in the foreground or KOP 8 because of the viewing distance and viewing angle. M2D2 in Alternative 3 would be built immediately adjacent to DD6 (an existing large structure) and would not extend farther south than DD6. In addition, Alternative 3 would demolish fewer facilities than Alternative 2. Using colors similar to existing facilities in the shipyard would help minimize visual contrast and allow the proposed facilities to better blend into the surroundings.

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		The new M2D2 would provide a facility for the USS Gerald R. Ford-class carrier(s). The Ford-class carrier(s), when present, would be more discernible but consistent with the existing shipyard and industrial landscape character. The existing storage facility on Burwell Street would be demolished and replaced with a new shipyard support building. The overall footprint of the new structure is expected to be similar to the existing facility; however, the new shipyard support building would be taller than the existing structure and result in reduced background views beyond the building, specifically for KOPs 9, 10, and 11. The Navy would demolish approximately 30 permanent buildings and utility facilities, and demolish or relocate more than 50 trailers, modular units, sheds, and enclosures at NAVBASE Kitsap-Bremerton. These facility modifications and replacement buildings would generally not be visible from the KOPs because of long viewing distances and viewing angles and would be similar in character to existing structures. **NAVBASE Kitsap-Bangor** The Navy would construct a new forge shop and associated parking area and expand the existing mission support area (Radio Hill complex) on NAVBASE Kitsap-Bangor. There are no off-installation views of the forge shop site or Radio Hill complex. The surrounding	Alternative 3 includes relocating existing inactivated, defueled nuclear-powered ships from Mooring A to Moorings E, F, and G. Inactivated ships currently located at Moorings E, F, and G would be displaced and relocated to other suitable locations. The inactive ships at Moorings E, F, and G are visible to motorists driving east on SR 304. with other inactive vessels would be a noticeable difference to motorists but would be consistent with the shipyard character and would result in a negligible impact. **NAVBASE Kitsap-Bangor** The Navy would permanently expand the existing mission support area at NAVBASE Kitsap-Bangor. The new buildings would be consistent with the industrial character of other structures that support military operations. There are no off-installation views of the existing mission support areas. The area is surrounded by dense forest consisting of mature conifers that separates viewers (i.e., military personnel and authorized visitors) from the mission support area. The expanded mission support area and buildings would continue to be obscured by the forest, and there would be no visible changes to the landscape character. Thus, there would be no visual resources impacts associated with the Radio Hill complex expansion at NAVBASE Kitsap-

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		area is densely forested with mature conifers and separates viewers (i.e., military personnel and authorized visitors) from the site. Therefore, there would be no public views of the forge shop or Radio Hill complex and no visual resources impacts associated with these actions at NAVBASE Kitsap-Bangor. Changes to the night sky view from operation-related nighttime lighting at NAVBASE Kitsap-Bangor would be minor	Bangor. Changes to the night sky view from operation-related nighttime lighting at NAVBASE Kitsap-Bangor would be minor
3.10 Noise	The Proposed Action would not occur; therefore, there would be no project-related or operations-related noise effects. Changes to noise exposure would be negligible due to natural hazards.	**NAVBASE Kitsap-Bremerton** Pile driving that would occur at NAVBASE Kitsap-Bremerton under Alternative 2 would represent the source of greatest temporary increase in noise associated with construction-related activities and the greatest potential for noise impacts to noise sensitive areas. Thirteen locations would experience L_{eq} 70 dB or greater during pile driving, an increase of 5 to 20 dB from the estimated existing conditions. In general, a 5 dB increase would be noticeable, a 10 dB increase is typically considered a dramatic increase, and 20 dB would be striking fourfold increase. The greatest noise levels of 84 dB L_{eq} and up to 92 dB L_{max} would occur at the Burwell Apartments (R10) and Lutheran Community Services Northwest (W06) due to pile driving for the M2D2 at the current DD3 location. Due to the 15-year construction schedule containing multiple periods of intense construction activity, people that would be exposed to noise, even less than significant levels, may not perceive the project as short-	**NAVBASE Kitsap-Bremerton** Pile driving that would occur at NAVBASE Kitsap-Bremerton under Alternative 3 would represent the source of greatest temporary increase in noise associated with construction-related activities and the greatest potential for noise impacts to noise sensitive areas. There would be a greater distance between the nearest schools and the proposed pile driving locations under Alternative 3 than Alternative 2. When compared with Alternative 2, school L_{eq} under Alternative 3 would be approximately 2 dB less. **NAVBASE Kitsap-Bangor** Although nearby sensitive receptors may be subject to increased noise, expansion of the Radio Hill complex would occur during daylight hours, which is exempt from state and Kitsap County noise regulations. Construction-related noise impacts at NAVBASE Kitsap-Bangor would be less than described in Alternative 2 because

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		term or temporary. Residents and school children near the proposed construction site would experience periods of increased annoyance due to elevated noise levels, which could interfere with classroom learning if windows are left open during those times. The relocation of portable abrasive blast equipment and ventilation systems to within 700 feet of the east end would result in increased operational noise levels that could be more noticeable to off-site receptors when an aircraft carrier is in M2D2. **NAVBASE Kitsap-Bangor** Although nearby sensitive receptors may be subject to increased noise, expansion of the Radio Hill complex would occur during daylight hours, which is exempt from state and Kitsap County noise regulations. The nearest noise sensitive receptors at NAVBASE Kitsap-Bangor are base housing and the Admiral Boorda Teen Center, located over 800 feet from the proposed Radio Hill complex expansion site, and over 2,500 feet from the proposed forge shop site. An outpatient healthcare facility and medical education facility is located approximately 1,000 feet from the proposed forge shop location, although this facility is not considered noise-sensitive. Noise levels at these noise sensitive areas due to non-pile driving construction equipment at the proposed Radio Hill complex expansion area during the construction phase	Alternative 3 does not include construction of the forge shop.

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		would range from 50 to 65 dB L_{max}, which would be similar in L_{max} to a passing road vehicle.	
3.11 Utilities and Infrastructure	The Proposed Action would not occur; therefore, there would be no project-related effects on utilities.	**NAVBASE Kitsap-Bremerton** Adverse impacts to utilities would result from a disruption of service due to relocating utilities or when connecting or disconnecting utilities. Impacts would be short-term (less than 12 hours for most utilities) and localized to areas at PSNS & IMF where work was occurring. This Alternative would also require the permanent relocation of some utilities. New utility demand would be accommodated by the Proposed Action and would not conflict with existing demand or exceed capacity. Impacts to existing utility services and shipyard operations would be minimized through implementation of BMPs to reduce disruptions, such as scheduling utility turnovers outside of normal working hours or on weekends. Short-term and long-term capacity issues are not anticipated for the NAVBASE Kitsap-Bremerton sanitary sewer system, except for Lift Station 8, which may exceed the sanitary system capacity under certain conditions. Design and operational refinements to address this capacity issue would be addressed through project design. **NAVBASE Kitsap-Bangor** Impacts would be similar to the impacts at NAVBASE Kitsap-Bremerton, but of a lesser	**NAVBASE Kitsap-Bremerton** Similar to Alternative 2, except impacts would be of a lesser magnitude because Alternative 3 includes less demolition and construction. **NAVBASE Kitsap-Bangor** Similar to Alternative 2 except impacts would be of a lesser magnitude because the new forge shop would not be located at this installation.

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		magnitude because less construction would take place at this installation.	
3.12 Transportation	The Proposed Action would not proceed and there would be no changes to the transportation network other than changes associated with existing and already committed projects within the study area planned by the City of Bremerton, Kitsap County, and other government agencies. Operations would be expected to remain the same with no material increases in employment or installation population. However, due to projected background traffic growth, during a.m. and p.m peak hour, conditions would result in increased intersection delay and result in LOS F conditions at several intersections in 2030.	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** There would be several construction-related roadway impacts to passenger vehicles, active transportation (pedestrian and bicycles), transit, and freight networks forecasted at NAVBASE Kitsap Bremerton or at the park and ride locations. The future construction contractor may develop one or more off-site parking areas for construction workers. If an off-site parking area is established in the Bremerton airport area, degradation of LOS during peak hours at the following intersections is anticipated: • Shift 1 p.m.: SR 3 at Sam Christopherson Avenue intersection (Int #9) at LOS F related to additional project trips on eastbound through movement. • Shift 1 p.m.: SR 3 at Imperial Way intersection (Int #10) at LOS F related to additional project trips on eastbound left turn movement. • Shift 2 a.m.: SR 3 at Sam Christopherson Avenue intersection (Int #9) at LOS F related to additional project trips on northbound left turn and westbound through movements. • Shift 2 p.m.: SR 3 at Imperial Way intersection (Int #10) at LOS F related to additional project trips on southbound movements.	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** There would be no appreciable difference in construction-related impacts for Alternative 3 over Alternative 2. The traffic impact assessment methodology provides a peak number of construction workers traveling to the CIA each day relative to the overall construction schedule. The effects would be less when the number of workers is lower.

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		Mitigation measures include Navy review and approval of the construction contractor's Traffic Control Plan and Employee Parking Plan, which will include measures to reduce impacts to an acceptable Level of Service, such as adjusting construction worker shift times and using flag men during shift changes. Approximately 100-150 construction worker vehicles would park within the City of Bremerton and walk to NAVBASE Kitsap-Bremerton to work during the peak construction period. This could incrementally add to parking issues identified by the City of Bremerton. The Navy would address on-installation parking issues as part of construction management. The Navy will continue to coordinate with the City of Bremerton regarding the findings and recommendations of the Joint Compatibility Transportation Plan. No existing installation operational changes are expected. Day-to-day fluctuations involving on-installation personnel will continue, and pre-construction population and employment levels would not change. **NAVBASE Kitsap-Bangor** Construction on NAVBASE Kitsap-Bangor would generate trips on the new roadways serving the forge shop site and the expanded Radio Hill complex within the local roadway network. It is anticipated to require up to 100	

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		workers per day for the forge shop and up to 50 workers per day for the Radio Hill complex expansion. Approximately 10 individual round trips per week (or 2.5 round trips per day with a 4-day work schedule) would be expected between NAVBASE Kitsap-Bangor and Kitsap-Bremerton. The roundtrips are assumed to occur during the transportation network's off-peak hours, which would lessen the impact of these additional trips. Worker trips during peak periods would occur. These trips are not expected to have substantive impacts on roadway network levels of service.	
3.13 Marine Navigation	The Proposed Action would not occur; therefore, there would be no project-related or operations-related effects on marine navigation.	**NAVBASE Kitsap-Bremerton** Construction would add to the existing marine traffic with increased number of vessels in and around the construction sites, particularly with the transport of equipment, material, and personnel by vessel. Alternative 2 would require less vessel activity than Alternative 3 as there would be less construction and demolition material to move by vessel under Alternative 2 compared to Alternative 3. Alternative 2 would not require the additional vessel activity for dredging a new turning basin that would be included under Alternative 3. Naval marine traffic volumes and operation of the port security barrier would return to pre-construction levels once construction is	**NAVBASE Kitsap-Bremerton** Construction would add to the existing marine traffic with increased number of vessels in and around the construction sites, particularly with the transport of equipment, material, and personnel by vessel. Alternative 3 would require more vessel activity than Alternative 2 as there would be more construction and demolition material to move by vessel under Alternative 3 compared to Alternative 2. Alternative 3 would require additional vessel activity for dredging a new turning basin that would not be included under Alternative 2. Naval marine traffic volumes and operation of the port security barrier would return to

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		complete. There would be no additional maintenance dredging under Alternative 2. Therefore, there are no expected impacts to existing marine traffic during operations.	pre-construction levels once construction is complete. Therefore, there are no expected impacts to existing marine traffic during operations.
3.14 Public Health and Safety	The Proposed Action would not occur; therefore, there would be no project-related or operations-related effects on public health and safety. Public health and safety would be affected by potential impacts of natural hazards.	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** The following applies to all activities under Alternative 2, regardless of location (NAVBASE Kitsap-Bangor or NAVBASE Kitsap-Bremerton). Demolition and construction impact to public health and safety include an increase in construction traffic, noise, and the use of hazardous substances (i.e., POLs) and the generation of solid waste and potentially hazardous waste. In-water work (at NAVBASE Kitsap-Bremerton) or ground disturbance (at NAVBASE Kitsap-Bangor and NAVBASE Kitsap-Bremerton) in areas of known contamination could impact existing hazardous materials or COCs in a manner that increases human or environmental (i.e., ecological receptor) and human health exposure (e.g., disturbance of contaminated soils or sediment can cause them to be resuspended into the air or water). There is more construction and replacement proposed under Alternative 2, which means a greater use of hazardous materials and higher generation of hazardous waste, and potentially more noise and construction traffic than Alternative 3. However, the method of construction of the new M2D2 selected under Alternative 2 has lower potential for contamination risk than construction of the	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Construction-related impacts of Alternative 3 would be similar to Alternative 2. Impacts to public health and safety from elements unique to Alternative 3 are listed below. Under Alternative 3, construction and demolition activities, in particular those that would occur at the location of existing Mooring A (instead of DD3), would be farther to the west than activities associated with Alternative 2, and farther from sensitive receptors such as downtown Bremerton, Bremerton Waterfront District and Harborside Fountain Park, and residences north of 1st Street. Therefore, these areas may experience less noise than construction of Alternative 2. However, pile driving noise levels would be substantially greater than the existing noise at some noise sensitive locations. Alternative 3 would result in localized effects to public health and safety associated with ambient noise for the duration of construction activities; however, noise impacts would be lower than under Alternative 2. Under Alternative 3.

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		new M2D2 under Alternative 3 due to construction in a dry environment. There would be more upland and in-water demolition occurring under Alternative 2, which means a greater use of hazardous substances (i.e., POLs), higher generation of hazardous waste, greater potential for contamination, and potential for more noise than Alternative 3. Operational impacts are expected to be similar to current shipyard operations and the Proposed Action would not add additional impacts or risks.	Operation-related impacts of Alternative 3 on public health and safety would be generally similar to the described for Alternative 2.
3.15 Hazardous Materials and Wastes	The Proposed Action would not occur; therefore, there would be no project-related or operations-related effects on hazardous materials and wastes. Hazardous materials and wastes would be affected by potential impacts of natural hazards . Therefore, adverse effects could occur under the no-action alternative.	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** The following applies to all activities under Alternative 2, regardless of location (NAVBASE Kitsap-Bangor or NAVBASE Kitsap-Bremerton). Demolition and construction impact to hazardous materials and waste include an increase in the use of hazardous substances (i.e., POLs) and the generation of solid waste and potentially hazardous waste. In-water work (at NAVBASE Kitsap-Bremerton) or ground disturbance (at NAVBASE Kitsap-Bangor and NAVBASE Kitsap-Bremerton) in areas of known contamination could impact existing hazardous materials or COCs in a manner that increases human or environmental (i.e., ecological receptor) and human (health) exposure (e.g., disturbance of	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Construction-related impacts of Alternative 3 would be similar to Alternative 2. Impacts to hazardous materials and wastes from elements unique to Alternative 3 are listed below. Construction of the new M2D2 would occur 'in the wet,' unlike under Alternative 2 – As noted in Alternative 2, construction in a dry environment offers some separation between spills (should they occur) and direct contact with water bodies. The potential for impacts from hazardous materials and waste are higher with the Alternative 3 option of the new M2D2 construction.

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		contaminated soils or sediment can cause them to be resuspended into the air or water). A new forge shop would not be constructed under Alternative 3; therefore, the potential for impacts from hazardous materials and waste from the construction of a new forge shop is unique to Alternative 2. There would be more construction and replacement activities occurring under Alternative 2, which means a greater use of hazardous materials and higher generation of hazardous waste, than Alternative 3. However, the method of construction of the new M2D2 selected under Alternative 2 has lower potential for contamination risk than construction of the new M2D2 under Alternative 3 due to construction in a dry environment. There is more upland and in-water demolition occurring under Alternative 2, which means a greater use of hazardous substances (i.e., POLs), higher generation of hazardous waste, and greater potential for contamination, than Alternative 3.	Alternative 3 would demolish Mooring A and Pier 4, which is overall less demolition than would occur under Alternative 2. Upland demolition under Alternative 3 involves less dock/mooring infrastructure, fewer piers, fewer buildings, and fewer trailers, although more enclosures, than Alternative 2. Dredging of the new turning basin would only occur under Alternative 3. This is the only dredging proposed that would occur outside of the NRA.
3.16 Socioeconomics	Under Alternative 1, the Proposed Action would not occur and there would be no changes to the socioeconomic conditions in the ROI other than changes associated with the reasonably foreseeable future actions. Those changes include beneficial construction spending and potential adverse effects such as increased demand	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Population The peak construction workforce under Alternative 2 would be a maximum of two shifts of 1,000 on-site workers. A large portion	**NAVBASE Kitsap-Bremerton and NAVBASE Kitsap-Bangor** Impacts under Alternative 3 would be similar to those described for Alternative 2. Under Alternative 3, construction activities are scheduled to last 15 years. The peak construction workforce is estimated to be

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
	for schools and housing. Conversely, not implementing the Proposed Action would not result in beneficial or adverse impacts associated with construction activities.	of the workforce is estimated to come from outside of the ROI. However, large population centers in Seattle and Tacoma that could supply construction workers would be within commuting distance of the project area. The temporary nature of construction jobs makes it less likely that workers will relocate to the ROI. At the peak of construction, which is estimated to include 1,000 on-site workers, this would total 114 workers moving to the ROI. The average household size in Washington is 2.5 people, so if each worker brought an average sized family with them the total population increase would be 285 people, approximately a 0.1 percent increase from the baseline. Population growth from relocating workers and their families would increase demands on housing and public services such as schools, health and safety services, and roads. This would be a minor permanent adverse impact. Population growth from relocating workers and their families would stimulate economic activity and increase tax revenues through income and spending. This would be a minor permanent beneficial impact. <u>Schools</u> Population increases would increase demands on housing and public services such as schools, health and safety services, and roads and would stimulate economic activity and	the same as under Alternative 2, which results in the maximum impact estimates for population, schools, and housing all being the same. Employment, income, and domestic product would all have a slightly larger beneficial impact per year. Tax revenues generated under Alternative 3 would be higher per year. Operation under Alternative 3 would generally follow the same shipyard procedures for scheduling and completing maintenance and decommissioning. Operational shipyard workforce would not significantly change after construction. Some workforces would shift to new facilities at NAVBASE Kitsap-Bangor. Operational employment and local expenditures are expected to remain similar to current levels.

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		increase tax revenues through income and spending. An increase in the number of students would impose costs on the local school district as they would be responsible for providing educational services for those children. The analysis assumes that for each of the 114 workers who relocate to the ROI during construction, there would be an additional 0.4 child that would enroll in the local school system. This would equate to a total of 46 students at the peak of construction which would be an increase in the number of students in the ROI of less than 0.2 percent. This would be a minor permanent adverse impact. <u>Housing</u> As a conservative estimate, this analysis assumes that each of the 114 workers who would relocate to the ROI at the peak of construction would require one housing unit. The 114 housing units would equate to 1.4 percent of the total vacant housing units in the ROI. The increase in the demand for housing would reduce the amount of available housing and may contribute to an increase in housing prices and rental rates. This would be a minor permanent adverse impact.	

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		Employment and Income In addition to the on-site workforce, local businesses may hire more workers to support the construction effort or provide services to construction workers. An estimated 1,214 direct, indirect, and induced jobs per year would be supported in the ROI during the 15 years of construction. Labor income supported by construction activities would total approximately $76.4 million per year. The increased jobs and labor income in the ROI would be a moderate temporary beneficial impact. Economic Activity Construction spending and hiring in the ROI would increase the total gross product in the county. During the 15 years of construction there would be an estimated increase of $89.2 million per year. The stimulated local economy would be a moderate temporary beneficial impact.	

Section and Resource Category	*Alternative 1 (No-Action)*	*Alternative 2 (Preferred Alternative)*	*Alternative 3*
		<u>State and Local Taxes</u> Spending in the ROI would stimulate tax revenues including an estimated $1.7 million per year to the State of Washington and $316,163 per year to Kitsap County. The increase in tax revenues would be a moderate temporary beneficial impact. Operation under Alternative 2 would generally remain the same. Operational shipyard workforce would not significantly change after construction. Some workforces would shift to new facilities at NAVBASE Kitsap-Bangor. Operational employment and local expenditures are expected to remain similar to current levels.	

Legend: ACHP = Advisory Council on Historic Preservation; BMP = best management practice; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CM = cubic meter; CMP = Compensatory Mitigation Plan; COC = contaminant of concern; CWA = Clean Water Act; CY = cubic yard; dB = decibel; DD = Dry Dock; DNL = Day-Night Average Sound Level; DoD = Department of Defense; DU = Decision Unit; Ecology = Washington Department of Ecology; EFH = Essential Fish Habitat; ESA = Endangered Species Act; GHG = greenhouse gas; HAP = hazardous air pollutant; KOP = key observation point; L_{max} = maximum sound level; M2D2 = multi-mission dry dock; MBTA = Migratory Bird Treaty Act; NAAQS = national ambient air quality standards; NAVBASE = Naval Base; Navy = U.S. Department of the Navy; NHL = National Historic Landmark; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; NPDES = National Pollutant Discharge Elimination System; NPS = National Park Service; OU = Operable Unit; POLs = petroleum, oils, lubricants; PSNS = Puget Sound Naval Shipyard; RFFA = reasonably foreseeable future action; ROD = Record of Decision; ROI = region of interest; SF = square feet; SHPO = State Historic Preservation Officer; SWPPP = Stormwater pollution prevention plan; U.S. = United States; UFC = United Facilities Criteria; USACE = U.S. Army Corps of Engineers; EPA = Environmental Protection Agency; USFWS = U.S. Fish and Wildlife Service; WOTUS = waters of the United States

4 Other Considerations Required by National Environmental Policy Act

This section describes applicable federal, regional, state, and local land use plans, policies, and controls; irreversible or irretrievable commitments of resources; unavoidable adverse impacts; and the relationship between short-term use of the environment and long-term productivity.

4.1 Consistent with Other Federal and State Laws, Plans, Policies, and Regulations

Analysis of environmental consequences shall include a discussion of possible conflicts between the Proposed Action alternatives and the objectives of federal, regional, state, and local land use plans, policies, and controls. Appendix C lists the applicable federal, state, and local laws and regulations.

4.2 Irreversible or Irretrievable Commitments of Resources

NEPA requires that environmental analysis include identification of "any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented" (42 U.S.C. section 4332). Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and natural or cultural resources. Human labor is also considered an irretrievable resource. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Another impact that falls under this category is the unavoidable destruction of natural resources.

Table 4.2-1 identifies potential irreversible or irretrievable resources committed with implementation of the Proposed Action. These resources are generally the same for all action alternatives unless otherwise noted.

Table 4.2-1 Irreversible or Irretrievable Commitments of Resources

Resource	*Irreversible or Irretrievable Commitment*
Water Resources	Water resources would be irretrievably committed because of permanent and long-term change in bathymetric conditions associated with dredging, shoreline modification, and placement of in-water structures and fill.
Geological Resources	Geological resources would be irretrievably committed because of permanent and long-term changes in bathymetric conditions or disturbance of subsurface geology and marine sediment associated with dredging, pile driving, fill, and quay wall construction at NAVBASE Kitsap-Bremerton. Geological resources would be irretrievably committed because of permanent clearing associated with construction of the new forge shop and expansion of Radio Hill complex.
Cultural Resources	Cultural resources, including historic properties and structures, would be irreversibly lost because of permanent impacts from demolition of buildings and structures.
Biological Resources	At NAVBASE Kitsap-Bremerton, marine biological resources have the potential to be temporarily impacted because of dredging and in-water construction/pile driving. At NAVBASE Kitsap-Bangor, terrestrial biological resources would be affected through construction and clearing associated with construction of a new forge shop and expanding Radio Hill complex. Additionally, there is potential for adverse impacts to federally listed marine wildlife species and marbled murrelet in the study area.
Utilities	Utility capacity would be irreversibly committed to meet the demand from project construction and operations.

Resource	*Irreversible or Irretrievable Commitment*
Construction Materials and Labor	Irreversible consumption of renewable and non-renewable resources would be required for construction, including metals, aggregate, cement, wood, and other materials, as well as labor hours.
Energy Resources	Non-renewable energy resources (e.g., gasoline, diesel, natural gas, and electrical power generated from these fuels) would be irreversibly committed for project construction and operations.
Financial Resources	Planning, design, construction and operations would require commitment of federal funds that are not retrievable.

4.3 Unavoidable Adverse Impacts

An EIS must describe adverse environmental effects that cannot be avoided should the proposal be implemented. Adverse impacts are defined as unavoidable if they meet the following two criteria:

- There are no reasonable and practicable measures to eliminate the proposed project's impacts.
- There are no reasonable alternatives to the proposed project that would meet its purpose and need, eliminate its impacts, and not cause other or similar significant adverse impacts.

Table 4.3-1 summarizes unavoidable adverse impacts that could result from implementation of action alternatives after consideration of BMPs identified in Appendix A. Resources not listed in the table are not anticipated to have unavoidable adverse impacts, or potential impacts to those resources would be negligible. Implementation of BMPs and permitting identified in Chapter 3 would further minimize and potentially eliminate impacts. Potential mitigation will not be considered final until completion of the EIS ROD, agency and tribal consultations, and all permitting processes. The Navy will document any required mitigation in its ROD. Mitigation required by resource agencies would be specified in their respective permits and consultation documents.

Table 4.3-1 Unavoidable Adverse Impacts

Resource	*Unavoidable Adverse Impacts*
Air Quality and Greenhouse Gases	Construction activities (e.g., road and vessel traffic, fuel-burning equipment) would increase emissions and generate fugitive dust. Implementation of BMP AQ-1 would reduce fugitive dust plumes. GHG emissions would be generated during the construction period, after which emissions from operations would be anticipated to return to baseline conditions.
Water Resources	Construction activities such as dredging, in-water construction, fill, and pile driving would result in unavoidable impacts to marine waters. A compensatory mitigation plan would be developed as part of the USACE permitting process.
Geological Resources	Construction would permanently alter topography, soils, and bathymetry within the footprint of facilities. After construction, no additional impacts to geological resources are anticipated.
Biological Resources: General	Potential for adverse impact to marine biological resources would result from short-term in-water actions during construction such as dredging, in-water construction, and pile installation/removal. Adverse impacts could also result from vessel strike or disturbance to benthic environment from vessel traffic, night lighting, and shading at barge moorings. Potential for adverse impacts to terrestrial species at NAVBASE Kitsap-Bangor during clearing and construction activities. Adverse effects to biological resources would be avoided and/or minimized to the extent practicable in consultation with USFWS and NMFS.

Resource	*Unavoidable Adverse Impacts*
Biological Resources: Benthic Environment at NAVBASE Kitsap-Bremerton and terrestrial habitat at NAVBASE Kitsap-Bangor	Permanent adverse impacts to the benthic environment would result from dredging, in-water construction, sediment disposal, fill, and pile driving by permanently removing substrate. Localized adverse impacts could also result from increased turbidity, covering from sediment and potential changes to chemical composition and pH levels that could persist through the duration of in-water work. Adverse effects to benthic environment would be avoided and/or minimized to the extent practicable in consultation with the NMFS and USFWS. The Navy will implement compensatory mitigation actions to mitigate losses to aquatic resources as required under Section 404 of the Clean Water Act. Permanent loss of upland habitat with clearing of vegetation associated with building a new forge shop and expanding Radio Hill complex. Adverse effects to terrestrial species habitat would be avoided and/or minimized to the extent practicable in consultation with the USFWS for potential impacts to marbled murrelet.
Cultural Resources	Construction-related impacts would occur through demolition of historic buildings and structures. These impacts would be permanent and cause adverse effects to historic properties. Five historic properties would be demolished. Consultation and definition of measures to resolve adverse effects would be addressed pursuant to section 106 of the NHPA.
Visual Resources	Loss of the hammerhead crane, shipfitter-welder shop, and Storage Facility would change views from land and water-based viewpoints.
Noise	During construction, the greatest noise levels of 84 dB L_{eq} and L_{max} of up to 92 dB would occur at 606 Burwell Apartments due to pile driving for the M2D2 at the DD3 location. The nearby Lutheran Community Services Northwest would experience similar noise levels at 81 dB L_{eq} and 89 dB L_{max}. Other locations would also experience elevated L_{eq} above 65 dB due to M2D2 pile driving. All pile driving noise would be temporary and would not affect the long-term noise environment. Under Alternative 3 the proposed location of M2D2 would be approximately one-half mile southwest from the Alternative 2 site, which would be farther from the installation boundary and noise sensitive receptors. The results would be fewer locations that would experience L_{eq} of 65 dB or greater.
Transportation	During construction there would be an adverse impact to the level of service at two intersections, State Route 3 and Sam Christopherson Avenue and State Route 3 and Imperial Way. These impacts would be temporary during construction and would be mitigated through measures such as adjusting construction worker shift times, using construction flag men, and/or restriping affected intersections.
Public Health and Safety	Adverse impacts to public health and safety resulting from daily noise levels that exceed 65 dB would occur at multiple locations. Noise impacts would be reduced by implementing BMPs identified in Appendix A.
Hazardous Materials and Wastes	During construction there would be an increase in the use of hazardous materials, and generation of solid waste and potentially hazardous waste associated with construction activity. Standard construction site BMPs would be implemented to minimize hazards. Operational impacts from hazardous materials and wastes handling would be controlled or eliminated through project design that would incorporate all applicable federal, state, DoD, and Navy safety standards and requirements.

Legend: BMP = best management practice; CO_2e = carbon dioxide equivalent; dB = decibel; DD = Dry Dock; GHG = greenhouse gas; L_{eq} = Equivalent Sound Level; L_{max} = maximum sound level; M2D2 = multi-mission dry dock; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; NRHP = National Register of Historic Places; PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility; USACE = U.S. Army Corps of Engineers

4.4 Relationship Between Short-Term Use of the Environment and Long-Term Productivity

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the

long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development site reduces future flexibility in pursuing other options, or that using a parcel of land or other resources often eliminates the possibility of other uses at that site.

Short-term uses of the environment associated with the action alternatives are generally the same as the environmental impacts described for each resource, as detailed in Chapter 3. These impacts include both temporary and permanent "use" of the physical environment as a result of developing the proposed project, and energy and resource use during construction and operations of the project. Construction would involve short-term increases in fugitive emissions and construction-generated noise and would increase the use of fossil fuels to power equipment. In addition, expenditures of public funds and the use of labor would be required. Long-term changes would include alteration to the water depth at the approach channels and the turning basin in Alternative 3. However, proposed project activities would occur primarily within areas that are currently developed, and the additional development associated with the project is expected to be consistent with the existing landscape. The short-term use of resources addressed in this EIS, with the exception of biological productivity, would not be expected to affect long-term productivity. Table 4.4-1 summarizes the relationship between short-term use of the environment and long-term productivity with implementation of the action alternatives. This relationship would not be appreciably different from one action alternative to another.

Table 4.4-1 Relationship between Short-term Use of the Environment and Long-term Productivity

Resource	*Relationship between Short-term Use of the Environment and Long-term Productivity*
Biological Productivity	• Short-Term [(1)]—Construction would result in temporary disturbance to terrestrial and marine wildlife, including federally listed species. Unavoidable adverse effects to marine resources and habitats are described in Table 4.3-1. • Long-Term [(1)]—Permanent effects would include removal of terrestrial and benthic habitat. However, these impacts are not expected to affect long-term biological productivity. [(2)] • The Navy will consider conservation measures and recommendations, BMPs, and/or mitigation measures as written in final Biological Opinions from NMFS and USFWS.

Notes: [(1)] For the purpose of this evaluation, "short-term" refers to the construction phase of the project, while "long-term" refers to the operational phase of the project and permanent facilities post-construction. [(2)] For the purpose of this evaluation, biological productivity generally means the productivity of organisms and ecosystems.

Legend: BMP = best management practice; EIS = Environmental Impact Statement; NMFS = National Marine Fisheries Service

REFERENCES
There are no references in this chapter.

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This EIS was prepared collaboratively between the Navy and contractor preparers.

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Patrick Kester	Noise Lead	12	B.S., Mechanical Engineering
Anne Minihan, AICP	Utilities Lead	15	Juris Doctor; B.A., American Studies
Mark Lippert, AICP	EIS Transportation Section Lead	25	B.S., Geography M.S., Urban and Regional Planning
Richard Stolpe	Public Health and Safety Lead	21	M.A., Physical Geography
Daniel Ortega	Public Health and Safety, Hazardous Materials and Wastes	2	M.S., Biology
Lisa Woeber	Senior Reviewer for Public Health and Safety and Hazardous Materials and Wastes	25	B.B.A., Business Administration

Name	*Role*	*Years of Experience*	*Degree(s)*
Raul Castillo	Socioeconomics Lead	7	M.S., Urban Planning
Carolyn Dunmire	Socioeconomics Senior Reviewer	35	M.S. Engineering-Economics Systems
Chandy John, Ph.D.	Sediment F&T Modeling	26	Ph.D., Civil Engineering
Rob Larkin	Climatic Trends Lead	16	Master of Environmental Science and Management
Roger L. Wayson	Climatic Trends Senior Reviewer	48	Ph.D., P.E., Civil Engineering (Environmental)
Stephanie Clarke, GISP	EIS Lead GIS Analyst	8	B.S., Biology and Environmental Studies
Courtney Brozovsky	GIS Lead	13	B.S., Environmental Science
Gwen Vineyard	Technical Edit/Production	40	A.S., Legal Secretarial Science

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6 Distribution List

Elected Officials

- U.S. Senate, State of Washington
- U.S. House of Representatives, State of Washington, Representative, District 6
- State of Washington, Governor
- State of Washington, State Legislature, Senator, District 23
- State of Washington, State Legislature, Senator, District 26
- State of Washington, State Legislature, Senator, District 35
- State of Washington, State Legislature, Representatives, District 23
- State of Washington, State Legislature, Representatives, District 26
- State of Washington, State Legislature, Representatives, District 35
- City of Bremerton, Mayor
- City of Bremerton, Councilmembers, Districts 1 – 7
- City of Port Orchard, Mayor
- City of Port Orchard, At-Large and Councilmembers, Districts 1 – 6
- Kitsap County, Commissioners, Districts 1 – 3

Native American Tribes

- Suquamish Tribe, Tribal Council
- Suquamish Tribe, Tribal Historic Preservation Officer
- Skokomish Tribe, Tribal Council
- Port Gamble S'Klallam Tribe, Tribal Council
- Jamestown S'Klallam Tribe, Tribal Council
- Lower Elwha Klallam Tribe, Tribal Council

Federal Agencies

- U.S. Coast Guard Maritime Force Protection Unit Bangor
- U.S. Coast Guard, 13th District
- Advisory Council on Historic Preservation
- National Oceanic and Atmospheric Administration, Fisheries Directorate
- National Oceanic and Atmospheric Administration, Office of Protected Resources
- National Oceanic and Atmospheric Administration, West Coast Region
- U.S. Army Corps of Engineers, Northwestern Division
- U.S. Army Corps of Engineers, Seattle District
- U.S. Environmental Protection Agency, Office of Federal Activities, NEPA Compliance Division
- U.S. Environmental Protection Agency, Region 10
- U.S. Fish and Wildlife Service, Pacific Region
- U.S. Fish and Wildlife Service, Western Washington Office
- U.S. National Park Service, Region 9

State Agencies

- Puget Sound Clean Air Agency
- Puget Sound Partnership
- Washington Department of Fish and Wildlife
- Washington Department of Fish and Wildlife, Coastal
- Washington State Department of Archaeology and Historic Preservation, State Historic Preservation Officer
- Washington State Department of Commerce
- Washington State Department of Ecology
- Washington State Department of Ecology, Northwest Regional Office
- Washington State Department of Natural Resources
- Washington State Department of Natural Resources, Orca-Straits District
- Washington State Department of Natural Resources, Shoreline District
- Washington State Department of Transportation
- Washington State Department of Transportation, Olympic Region
- Washington State Ferries
- Washington State Transportation Commission
- Washington State Legislature Joint Committee on Veterans' & Military Affairs
- Washington Veterans Home Port Orchard

Local Agencies

- Central Kitsap Fire and Rescue
- City of Bremerton, Community Development
- City of Bremerton, Fire Department
- City of Bremerton, Planning Commission
- City of Bremerton, Planning Commission
- City of Bremerton, Police Department
- City of Bremerton, Public Works and Utilities
- City of Bremerton, Transportation Benefit District
- City of Port Orchard, Community Development
- City of Port Orchard, Planning Commission
- City of Port Orchard, Police Department
- City of Port Orchard, Public Works/Engineering Department
- City of Port Orchard, Transportation Benefit District
- Hood Canal Coordinating Council
- Kitsap County, Sheriff
- Kitsap County, Department of Community Development
- Kitsap Public Health District
- Kitsap Regional Coordinating Council
- Kitsap Transit
- Port of Bremerton
- South Kitsap Fire and Rescue

Economic and Trades Organizations

- Bremerton Chamber of Commerce
- Bremerton Housing Authority
- International Federation of Professional and Technical Engineers Local 12
- Kitsap Economic Development Alliance
- Port Orchard Bay Street Association
- Port Orchard Chamber of Commerce
- Puget Sound Naval Bases Association
- Puget Sound Ship Repair Association

Community/Civic Organizations

- Kitsap Immigrant Assistance Center
- National Association for Black Veterans, Bremerton/Kitsap County Chapter #0058
- Veterans of Foreign Wars Post 239
- Bremerton Rotary Club
- Navy League of the United States – Bremerton-Olympic Peninsula Council
- Port Orchard Rotary Club
- Rotary Club of South Kitsap
- Downtown Bremerton Association
- Bremerton Union Hill Neighborhood Association
- Manette Neighborhood Coalition

Environmental/Historic Resources/Other Non-Governmental Organizations

- Association for Washington Archaeology
- Bremerton Historic Ships Association
- Conservation Northwest
- Environment Washington
- Great Peninsula Conservancy
- Kitsap Audubon Society
- Kitsap County Historical Society
- Kitsap Environmental Coalition
- Puget Sound Navy Museum
- Puget Sound Restoration Fund
- Puget Soundkeeper
- Sierra Club Washington State
- The Nature Conservancy Washington
- Toxic-Free Future
- USS Turner Joy DD 951 Naval Destroyer Museum
- Washington Environmental Council
- Washington Trust for Historic Preservation

Fishing/Recreational Groups and Marinas

- Bremerton Marina and Port Orchard Marina
- Bremerton Yacht Club
- Bridgeview Marina
- Freedom Boat Club Port Orchard
- Kitsap Marina
- Kitsap Poggie Club
- Messin' Around Fishing Charter
- Port Orchard Railway Marina
- Port Orchard Yacht Club
- Puget Sound Sailing Institute
- Sinclair Inlet Marina
- Sinclair Yacht Club
- Suldan's Boat Works
- Venture Charters
- Yachtfish Marine

Information Repositories

- Kitsap Regional Library Downtown Bremerton
- Kitsap Regional Library Port Orchard
- Kitsap Regional Library Silverdale
- Kitsap Regional Library Sylvan Way
- Seattle Public Library Central Library