U.S. Department of Homeland Security

United States Coast Guard

EXPANSION AND MODERNIZATION OF BASE SEATTLE

DRAFT
PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

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U.S. Coast Guard Shore Infrastructure Logistics Center
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PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

for

EXPANSION AND MODERNIZATION OF BASE SEATTLE

Lead Agency:	U.S. Coast Guard
Cooperating Agency:	Washington State Department of Transportation
Title of the Proposed Action:	Expansion and Modernization of Base Seattle
Designation:	Revised Preliminary Draft Programmatic Environmental Impact Statement

Abstract

The U.S. Coast Guard (Coast Guard) prepared this Programmatic Environmental Impact Statement (PEIS) to comply with the federal National Environmental Policy Act (NEPA). The purpose of the proposed expansion and modernization of Base Seattle is to provide adequate and efficient facilities and infrastructure at Base Seattle to support the Coast Guard's execution of its current and future statutory missions, pursuant to 14 U.S. Code (USC) §102. The proposed expansion and modernization is needed to address substantial existing deficiencies with facilities and infrastructure at Base Seattle that hamper the efficient execution of Coast Guard missions. Facility enhancements would support current and future major cutters homeported at Base Seattle. The following four Alternatives were analyzed in the PEIS:

1. No Action Alternative: The Coast Guard would not implement land acquisition, facility modernization requirements, or infrastructure enhancements. Base Seattle would not be upgraded to make a suitable location to homeport Polar Security Cutters (PSCs) and other potential future major cutters
2. Alternative 1: Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)
3. Alternative 2: Modernization with Additional Land from Terminals 30 and 46
4. Alternative 3: Modernization with Additional Land and One Berth at Terminal 46

In this PEIS, the Coast Guard broadly analyzed potential impacts on physical, biological, and socioeconomic environmental resources resulting from proposed activities under the alternatives. Evaluated resources included: land use; geological resources; water resources; transportation; air quality, greenhouse gases, and climate change; biological resources; socioeconomics and environmental justice; cultural resources; noise; utilities and public services; hazardous materials and wastes; visual resources; recreational resources; and greenhouse gases and climate change.

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EXECUTIVE SUMMARY

Background

The United States (U.S.) Coast Guard (Coast Guard) has prepared this Programmatic Environmental Impact Statement (PEIS) to analyze the potential for significant impacts to the environment from the proposed expansion and modernization of Coast Guard Base Seattle in Seattle, Washington.

Base Seattle requires physical improvements to ensure the capability to provide a full range of mission and personnel support now and into the future. The Base is the main mission support unit for Coast Guard District 13 (Northwestern U.S.) and polar (Arctic and Antarctic) areas of responsibility (AORs) and areas of operations. Because the Base is limited in size, land acquisition is required to allow for full facilities development, including infrastructure to support future homeported vessels. Land acquisition would also provide flexible equipment and materials storage, improve accessibility to berths and cutters, provide adequate parking and laydown space, and enable flexibility for future expansion of shore-side assets. In the future, paved and parking areas may be used for equipment staging, emergency storage, and other similar or related uses.

Base Seattle contains both shore-side and waterside infrastructure. With the exception of Building 4 (Shore Operations), most buildings and infrastructure at Base Seattle are beyond their service life, do not meet current standards or Coast Guard requirements, or are otherwise deficient. These conditions impede the Coast Guard's ability to execute current and future missions efficiently (U.S. Coast Guard 2006).

The scope of this PEIS analysis focuses on the proposed Base Seattle expansion and on renovating and modernizing facilities and infrastructure at the Base. These actions are needed to address proposed growth; address current deficiencies attributed to aged, outdated, and deteriorated facilities; and modernize and enhance the Base to provide adequate and necessary infrastructure to support future cutters and missions.

Modernization and renovation efforts would ensure operational and mission support requirements are provided for properly and enhance the resiliency and long-term sustainability of Base Seattle's facilities and infrastructure. Planning with future mission flexibility in mind also minimizes the need for costly future infrastructure modifications and the resulting environmental impacts. To ensure the Coast Guard is ready for today's challenges while preparing for the threats of tomorrow, it must modernize its shore-side assets to meet operational and support requirements of current and future afloat assets (e.g., major cutters). Future mission success relies on continual recapitalization of boats, cutters, aircraft, and infrastructure.

Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to provide adequate and efficient facilities and infrastructure at Base Seattle to support the Coast Guard's execution of its current and future statutory missions, pursuant to 14 U.S. Code (USC) §102. Base Seattle is the largest Coast Guard installation in the Pacific Northwest and is an essential facility to support Coast Guard missions in the Pacific Northwest and polar (the Arctic and Antarctica) regions, now and for the foreseeable future. To support Coast Guard mission execution throughout these AORs, Base Seattle requires extensive modernization and renovation of facilities and infrastructure.

The Proposed Action is needed to address substantial existing deficiencies with facilities and infrastructure at Base Seattle that hamper the efficient execution of Coast Guard missions. Facility enhancements are also necessary to support current and future major cutters homeported at Base Seattle. Replacing legacy ice breakers and other major cutters homeported at Base Seattle with modern major cutters would require infrastructure enhancements and renovations to accommodate the enhanced size and shore-side utilities support requirements associated with these advanced operating assets. The Coast Guard has identified deficiencies that include, but are not limited to, resolving incompatible land uses, increasing berthing capacity, upgrading existing facilities and infrastructure, reducing congestion and parking shortfalls, providing a safer work environment, enhancing physical security capabilities, and providing new infrastructure, as necessary.

Proposed Action and Alternatives

The Coast Guard has determined the requirements to modernize and enhance existing facilities and infrastructure at Base Seattle. To that end, the Coast Guard has developed strategies to acquire land, demolish existing structures and construct new structures, expand and upgrade infrastructure, and meet safety and building codes necessary to support Coast Guard missions and the associated personnel at Base Seattle.

The Proposed Action to modernize and enhance facilities at Base Seattle comprises three specific categories of actions: (1) land acquisition; (2) construction, which includes demolition, rehabilitation, and renovation; and (3) long-term operations.

Alternative 1: Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Alternative 1 would involve acquisition of land on Terminal 46, including onshore development and access to existing berth space for two Coast Guard cutters. While additional work would occur on the existing Base property, this alternative would provide a single, large piece of property that would enable efficient expansion of Base facilities while providing the capability to incorporate the most effective AT/FP setbacks of all the alternatives. Acquiring two existing, structurally adequate berths would be the most cost-effective and efficient action and would reduce potential effects by eliminating the need to construct new berths. Under Alternative 1, approximately 27 to 54 acres of land would be acquired, including the 1.1-acre Belknap property from the Port of Settle and between 26 and 53 acres from the Port of Seattle at Terminal 46. The acquired property at Terminal 46 would provide 1,070 linear feet of new Coast Guard berthing space. The alternative would provide new parking on Base at Terminal 46 acquired property. Alternative 1 would include construction of several new facilities on Base.

Alternative 2: Modernization with Additional Land from Terminals 30 and 46

Alternative 2 would expand Base Seattle both to the north and south. Under Alternative 2, many of the proposed infrastructure modernization and expansion elements would occur within the current Base boundaries or on land acquired at Terminal 30 and berthing requirements would be satisfied by the development of two new berths to the south (Pier 35 E/F). Land acquired at Terminal 46 would be used for active cutter support services, material laydown areas, and AT/FP setbacks. Existing Base Seattle deficiencies would be resolved, AT/FP measures would be implemented, and aging infrastructure would be upgraded to meet current building codes (including seismic). Land acquisition under Alternative 2 would include 21.5 to 29.5 acres of land with the majority being 13.5 to 21.5 acres at Terminal 30, which would include Jack Perry Memorial Park. Two new berths would provide 1,120 linear feet of wharf

space. The berths would be constructed through the Pier 35E/F development with one berth on currently owned Coast Guard property and a second berth constructed on acquired property at Terminal 30. New parking would be distributed throughout the current Base boundaries as well as a portion of the newly acquired property at Terminal 30. Alternative 2 would include construction of several new facilities on Base.

Alternative 3: Modernization with Additional Land and One Berth at Terminal 46

Under Alternative 3, Base Seattle would expand to the north through land acquisition at Terminal 46 and would infill the current Base footprint by acquiring currently leased properties, as described below. Under Alternative 3, many of the proposed infrastructure modernization and expansion elements would occur within the current Base boundaries and on land acquired at Terminal 46. These elements include satisfying berthing requirements with construction of one new berth within the current Base boundaries (Pier 35E) and one additional existing berth at Terminal 46. Under Alternative 3, existing Base Seattle deficiencies would be resolved, AT/FP measures upgraded, and aging infrastructure would be upgraded to meet current building codes (including seismic). Under Alternative 3, the minimum acquired land would total approximately 24.25 to 32.25 acres with the majority of land being 21.75 to 29.75 acres at Terminal 46. Under this alternative, one existing berth totaling 560 LF would be acquired at Terminal 46. No further modifications are required for this berth. One berth would be constructed on Coast Guard property at proposed Pier 35. Work would likely include typical construction for waterfront facilities, such as pile and decking installation and possibly dredging. The construction configuration and details for this berth are unknown at this time due to the unknown extent of a Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) action that would have to occur prior to any pier construction. Parking would be distributed across the existing Base as well as a portion of newly acquired property at Terminal 46. Alternative 3 would include construction of several new facilities on Base.

No-Action Alternative

Under the No-Action Alternative, the Coast Guard would not implement land acquisition, facility modernization requirements, or infrastructure enhancements. Base Seattle would not be upgraded to make it a suitable location to homeport up to eight future major cutters. The No-Action Alternative would also eliminate the possibility of Coast Guard personnel relocating to Base Seattle from current facilities in downtown Seattle. Further, several buildings on Base could be forced to reduce capacity or risk losing functionality altogether if ongoing structural deterioration is not addressed. Delaying necessary demolition and construction projects would result in increased risks to the environment, the public, and the health and safety of Coast Guard personnel and visitors. Selecting the No-Action Alternative would significantly impair the Coast Guard's ability to accomplish its operational mission requirements throughout the Pacific Northwest and Arctic operational areas from Base Seattle. The No-Action Alternative would also leave requirements unfulfilled. The Coast Guard would not be able to continually comply with its statutory mandated missions effectively and efficiently. This alternative is carried forward for analysis in the PEIS to comply with the Council of Environmental Quality (CEQ) NEPA regulations (40 Code of Federal Regulations [CFR] §1502.14[c]) and to provide a comparative baseline against which to evaluate impacts of the Proposed Action and alternatives.

Environmental Consequences

Environmental consequences for each resource area were analyzed for the three primary components of the Proposed Action: land acquisition, construction, and operations. A summary of impacts for each

resource area analyzed in the PEIS is presented below. When all impacts, including cumulative impacts, are taken into account, the impacts from Alternative 1 would have a greater adverse impact to socioeconomics, whereas the impacts to Alternatives 2 and 3 would have a greater adverse impact to cultural resources, biological resources, and land use. There would be a greater beneficial impact to water resources and hazardous materials and wastes. There would be both a greater adverse impact and a greater beneficial impact to geological resources.

Land Use: Coast Guard use of existing and acquired lands would be compatible with surrounding Port and other industrial uses. Property acquisition under any action alternative would result in a change in land ownership and displacement of current Port/industrial uses. With the transition of ownership to the federal government, as many as 54 acres of current Port property would be removed from Port use and withdrawn from planning programs implemented by local entities. While the acreage identified represents less than three percent of total Port property, it would nevertheless displace existing uses that may or may not be able to be relocated elsewhere within the Port and preclude any future uses of the acquired property. Coast Guard land acquisition would not be consistent with the City of Seattle 2035 Comprehensive Plan, including, and especially the policies of the Container Port Element that seek to retain Port land for the Port and other industrial uses. Coast Guard land acquisition under any of the alternatives would result in direct, significant adverse impacts associated with displacement of existing uses and inconsistency with local land use plans.

Impacts associated with construction activities for the Base Seattle Expansion and Modernization program would be minimized through Environmental Conservation Measures (ECMs) and permit stipulations.

Pursuant to the Coastal Zone Management Act (CZMA), all action alternatives would be implemented in a manner that is consistent to the maximum extent practicable with the enforceable policies of the Washington Coastal Zone Management Program (WCZMP). Alternative 2 would be less consistent because the Coast Guard acquisition of Jack Perry Memorial Park would be inconsistent with polices to preserve public coastal access.

Geological Resources: Under all action alternatives, potential impacts from geologic hazards would be similar and only differ relative to the size and configuration of the Base Seattle modernization alternatives. The severity of expected impacts between all action alternatives would be similar, lessened from current conditions and the No-Action Alternative, and less than significant in both the short- and long-term. All of the action alternatives would result in greater resilience of Coast Guard facilities to geological hazards relative to the No-Action Alternative. Therefore, all action alternatives would, pursuant to NEPA, have no significant impacts related to geologic resources.

Water Resources: Based on the purely transactional nature of land acquisition, this component of the proposed modernization would have no potential to directly impact water resources. Upland construction would result in minor impacts on water quality (both surface water and groundwater) in the short-term through ground-disturbing activities that would potentially increase runoff to surface waters or percolation to groundwater. In-water construction may result in short-term adverse impacts on surface water quality by disturbing contaminated underwater sediments. It is anticipated that most of these materials would be removed prior to in-water work during separate CERLCA actions. All three alternatives would result in no significant impacts. Alternative 2 also has the greatest potential for in-water work to disturb contaminated sediments that would temporarily exceed water quality standards pursuant to the CWA. The work is however consistent with other activities that occur regularly in Puget

Sound that do not result in significant impacts. The No-Action Alternative would result in no impacts on water resources.

Transportation: All action alternatives would result in acquisition of Port of Seattle property, which may affect Port operations and result in decreased traffic on roadways proximal to Base Seattle, such as Alaskan Way South. Short-term, adverse impacts associated with construction-related traffic may be reduced slightly under Alternatives 2 and 3 due to the reduced area of disturbance. All long-term, adverse impacts associated with Base Seattle's expanded operation would remain the same across all of the alternatives. Alternatives 1, 2 and 3 would result in short- and long-term, direct, adverse impacts on transportation. The number of vehicle trips used to assess impacts on transportation assumes six cutters would be berthed at the Base at one time, with two in drydock service. Although this maximum use is unlikely to occur, it represents a worst-case analysis scenario. The No-Action Alternative would not result in increases in traffic levels at and from Base Seattle. Pursuant to NEPA, all action alternatives would not result in significant impacts on transportation.

Air Quality: Property acquisition under any of the alternatives would result in the displacement of existing Port operations, such as cargo storage, transport, and related services. These displaced functions would either be eliminated or relocated elsewhere within Port property. If these functions were to be eliminated, associated operational emissions (e.g., mobile source emissions associated with the transport of cargo containers) would also be eliminated. If these functions were relocated, there would be changes in long-term mobile source emissions. Assuming that existing Port functions would be relocated substantially within the Seattle area, emissions associated with these functions within the airshed would remain unchanged.

The use of heavy construction equipment for landside construction activities and in-water construction activities at Terminal 46 would also generate short-term increases in criteria air pollutant emissions. The details of such activities, including required construction equipment, hours of operation, and operating conditions, are not currently known for the proposed modernization activities. Applying conservative assumptions (e.g., all heavy equipment in operation for 8 hour per day, 5 days per week, 12 months per year) emissions would remain below *de minimis* thresholds defined at 40 CFR §93.153.

All of the project alternatives would result in *de minimis* emissions. None of the alternatives would change the airshed's attainment status. Therefore, pursuant to the Clean Air Act (CAA) and NEPA, the Proposed Action is exempt from the General Conformity Rule, because there would be no reasonably foreseeable direct or indirect emissions in nonattainment or maintenance areas, and there would be no significant impacts on air quality.

Biological Resources: There are slight variations between the three action alternatives with respect to upland property acquisitions, location of building demolitions/construction, and amount of upland ground disturbance required. The most significant difference with regard to upland impacts on terrestrial resources is related to Alternative 2. Under this scenario, the greatest areal extent of scattered upland vegetation would be removed, including native madrone trees and landscaped parkland associated with Jack Perry Memorial Park. This is considered a short-term adverse impact as new landscape areas are planned.

The possible direct behavioral responses of terrestrial wildlife species to airborne noise associated with upland construction activities are considered short-term and minor because substantial reductions in population size or distribution would not occur. Noise from upland construction activities would have no

impact on upland terrestrial habitat, aquatic species, designated essential fish habitat (EFH), or marine mammals.

Under all three action alternatives, in-water work would occur in the future. Specific details of the design are not known at this time. Also, species and habitats listed and protected under federal law may differ at the time of construction than now, so the analysis of effect is necessarily general. For all alternatives, in-water rehabilitation of the Terminal 46 wharf is proposed. Construction of new pier structures would also occur under Alternatives 2 and 3, which are not proposed under Alternative 1. Alternative 2 includes plans to build Pier 35E, which would span the southwestern portion of the current Base property and extend into Jack Perry Memorial Park and Terminal 30. Under this alternative, Pier 35F would also be expanded at Terminal 30. Alternative 3 calls for constructing Pier 35E only, which is proposed to span within the confines of the current Base property boundary. The construction of the new piers would occur in waters currently designated as critical habitat for the Chinook salmon and SRKW and EFH for groundfish and salmon. The long-term impacts are likely to affect critical habitat and therefore listed Chinook salmon and SRKW and EFH, and the Coast Guard will work with NMFS and the U.S. Army Corps of Engineers (USACE) as applicable to minimize impacts. The Coast Guard will consult with the USFWS and NMFS, as required under Section 7 of the Endangered Species Act to develop mitigations and measures to avoid jeopardy of species and adverse modification or destruction of critical habitat. The Coast Guard will apply for the applicable CWA permits from USACE. As part of a permit application, the Coast Guard will be required to consult with the Services, as appropriate, regarding the potential impacts to protected species. Pursuant to NEPA, no significant impacts on biological resources would be expected under any of the alternatives or the No-Action Alternative, either for the short-term upland work or future in-water work. When considered with cumulative impacts, there would be additional potentially significant Impacts due to potential CERCLA Actions that could impact the same biological resources.

Socioeconomics and Environmental Justice: Common to all three action alternatives, the acquisition of property would result in displacement of Port functions and an associated shift in local economic activity. The local economy would experience direct, short-term, beneficial effects associated with hiring of construction personnel, spending on materials, and local secondary spending associated with these increased activities during construction. The Base's long-term operation would involve a reconfiguration of buildings, functions, and associated support infrastructure (e.g., security measures, utilities). There would also be adverse impacts to the local economy, namely Port Operations. There would be a loss of lease revenue for the Port of Seattle equivalent to each action alternative's acquisition of port container land. There would also be a long-term loss of jobs in one sector. While other jobs are projected to be generated by the action alternatives, the jobs would be of a different type and have differing training/education requirements. Although not directly under the purview or control of the Coast Guard—the current homeless shelter is leased to the U.S. Army Corps of Engineers by the Coast Guard and operated independently by Catholic Community Services—it is anticipated that homeless shelter functions would resume following completion of improvements to Building 7. If the building is demolished and rebuilt, a new location may need to be found.

Regarding environmental justice considerations, adverse impacts have been identified for the homeless shelter users. They represent a minority community that is underserved that would be disproportionately impacted during the implementation of the Proposed Action. Therefore, pursuant to NEPA, there would be potentially significant impacts on socioeconomic resources, and pursuant to EO 12898 and 13045, potentially significant impacts would be expected to environmental justice

communities under all action alternatives. The No-Action Alternative would result in no impacts on socioeconomic resources or environmental justice.

Cultural Resources: All three action alternatives and the No-Action Alternative are anticipated to have no impacts on historic built-environment resources. No impacts on documented archaeological resources are anticipated; however, there is a potential archaeological resource (i.e., the pilings at Jack Perry Memorial Park) under Alternative 2 that would require documentation, NRHP evaluation, and assessment of effects if that alternative is selected.

Short- and long-term minor impacts would occur on U&A fishing from acquiring and/or constructing additional infrastructure for mooring cutters under all alternatives. Alternative 2 and Alternative 3 would cause potentially significant impacts on U&A fishing due to long-term adverse impacts on water resources from the shading of existing open water areas at Piers 35 or loss of water, if the area is filled in. Alternative 2 would also cause potentially significant impacts on U&A fishing due to long-term adverse impacts on recreation from the loss of public access at Jack Perry Memorial Park.

Pursuant to NEPA, Alternative 1 is anticipated to have no significant impacts on cultural resources, including historic built-environment, archaeological, and U&A tribal resources, pending government-to-government consultation. Alternatives 2 and 3 would result in potentially significant impacts on U&A fishing, but no significant impacts on archaeological and historic built-environment resources, pending documentation and government-to-government consultation. The No-Action Alternative would result in no impacts on all cultural resources. Pursuant to Section 106 of the NHPA, all alternatives would have no effect on historic properties pending documentation.

Noise: Alternative 1 would result in the expansion of the Base nearer to noise-sensitive uses as compared to the other alternatives. Therefore, of the three action alternatives, Alternative 1 has the greatest potential to generate noise that is audible at the nearest sensitive receptors; however, noise generation under all action alternatives would not exceed the thresholds established by the City of Seattle Noise Ordinance. Construction activities would be substantially similar under all action alternatives and, despite occurring in different areas under the different alternatives, noise impacts would remain similar. In comparison, under the No-Action Alternative, no short-term construction-generated noise would occur. Under all action alternatives, long-term noise generation at Base Seattle may increase due to a greater number of cutters requiring maintenance. Noise emissions from operations and maintenance activities would be similar to existing conditions because future activities would also be substantially similar to current levels. Under the No-Action Alternative, there would be no change to existing noise levels but slightly less noise than the action alternatives due to the reduced amount of maintenance and operational support activities.

Utilities and Public Services: Because Alternative 1 only involves the acquisition of property on Terminal 46, rather than properties on Terminal 46 and Terminal 30, Alternative 1 would allow for the most efficient utility infrastructure improvements. Nevertheless, the extent of removing and replacing existing utility lines under all of the action alternatives, would require similar levels of construction, because Base Seattle, Terminal 46, and Terminal 30 already receive domestic water, sanitary sewer, electrical power, and natural gas through existing infrastructure, and have storm drain systems. Therefore, pursuant to NEPA, the alternatives, including the No-Action Alternative, would have no significant impact on utilities and public services.

Hazardous Materials and Wastes: All alternatives, with the exception of the No-Action Alternative, would result in similar short- and long-term impacts on hazardous materials and wastes. Each of the alternatives would temporarily increase the use, storage, and disposal of minor amounts of hazardous materials at Base Seattle during the construction phase. All the alternatives, with the exception of the No-Action Alternative, would result in the disturbance of hazardous building materials as well as the disturbance of contaminated soils and/or groundwater. This includes the potential for significant impacts due to disturbance of contaminated bottom sediments associated with in-water work.

Long-term operations under all alternatives, with the exception of the No-Action Alternative, would result in increased use, storage, and disposal of hazardous materials and wastes. Each of these alternatives would also result in improvements to the existing HWAF and SAAs. None of the alternatives, including the No-Action Alternative, would impede the U.S. Environmental Protection Agency's ongoing cleanup operations at identified cleanup sites.

Therefore, pursuant to NEPA, the Proposed Action would result in potential short-term significant impacts due to contaminated sediment disturbance, and no other long-term significant impacts from hazardous materials and wastes.

Visual Resources: With the exception of the No-Action Alternative, all alternatives would impact visual resources associated with Base Seattle and surrounding environs. Alternative 1 would result in the greatest area of land acquisition and accompanying displacement of existing and potential future Port operations to enable Base expansion and modernization; however, proposed development at the Base would be visually consistent with both existing and zoned/permitted waterside and upland land use in the Lower Duwamish MIC and, although City of Seattle policies and objectives for visual quality do not apply to federal property, the proposed modernization of Base Seattle would not substantially conflict with these goals. Therefore, pursuant to NEPA, no significant impacts would occur to visual resources.

Recreational Resources: Except for Alternative 2, all alternatives, including the No-Action Alternative, would not impact recreational resources at Base Seattle or in the surrounding area. Alternative 2 would result in the displacement of Jack Perry Memorial Park. Other than the elimination of a point of public access to the waterfront, this park offers limited recreational opportunities. Therefore, pursuant to NEPA, no significant impacts would be expected on recreation under all alternatives.

Greenhouse Gases and Climate Change: All of the action alternatives would result in minor increases in GHG emissions. This increase in GHG emissions would be negligible in comparison to national and regional GHG emissions. Under the No-Action Alternative, existing facilities and infrastructure would remain unimproved from current conditions. No upgrades to enable energy efficiency or reduce emissions would be implemented, resulting in a missed opportunity to implement sustainability measures. Pursuant to NEPA, the Proposed Action would have no significant impacts on GHG emissions or climate change.

A comparison of impacts for each resource area across the alternatives is provided in Table ES-1.

Cumulative Impacts: Alternatives 2 and 3 would have a much greater cumulative impact than the cumulative impacts under Alternative 1. This is due to varying CERCLA actions that could occur if either alternative is implemented. If Alternatives 2 or 3 are implemented, a large amount of sediment removal from both in-water and onshore would be necessary to accommodate berthing. The cumulative CERCLA projects would most likely lead to a change in the shoreline itself. Additionally, the removal of

contaminated sediments would also cause a beneficial impact by improving water quality. This, when considered with Alternatives 2 and 3, would lead to a greater loss of nearshore habitat, shellfish beds, and potential impacts to U&A treaty rights. Alternative 2 would result in additional cumulative impacts to socioeconomics and environmental justice communities. Therefore, it is projected that there would be potentially significant cumulative impacts.

Table ES-1 Summary of Impacts

Resource	Alternative 1	Alternative 2	Alternative 3	No-Action Alternative
Land Use and Coastal Zone Management	Significant impacts to land use. Consistent to the maximum extent practicable with WCZMP, and no significant impacts to coastal resources.	Significant impacts to land use. Consistent to the maximum extent practicable with WCZMP, and no significant impacts to coastal resources.	Significant impacts to land use. Consistent to the maximum extent practicable with WCZMP, and no significant impacts to coastal resources.	No significant impacts.
	Cumulative - No additional significant impacts.	Cumulative - Additional short-term cumulative impacts.	Cumulative - No additional significant impacts.	Cumulative - No additional significant impacts.
Geological Resources	No significant impacts.	No significant impacts.	Potentially significant impacts	No significant impacts.
	Cumulative - No cumulative impacts.	Cumulative -Potentially significant impacts.	Cumulative -Potentially significant impacts.	Cumulative - No additional significant impacts.
Water Resources	No significant impacts.	No significant impacts.	No significant impacts.	No impacts.
	Cumulative - Potentially significant beneficial cumulative impact.	Cumulative - Potentially significant beneficial cumulative impact.	Cumulative - Potentially significant beneficial cumulative impact.	Cumulative - Potentially significant beneficial cumulative impact.
Transportation	No significant impacts.	No significant impacts.	No significant impacts.	No impacts.
	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative- No significant impacts.
Air Quality	No significant impacts.	No significant impacts.	No significant impacts.	No impacts.
	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative - No impacts.
Biological Resources	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.
	Cumulative - Significant beneficial impacts.	Cumulative - Potentially significant adverse impacts and significant beneficial impacts.	Cumulative - Potentially significant adverse impacts and significant beneficial impacts.	Cumulative - Significant beneficial impacts.
Socioeconomics and Environmental Justice	Significant impacts to socioeconomics and potentially significant impacts to an environmental justice community.	Significant impacts to socioeconomics and potentially significant impacts to an environmental justice community.	Significant impacts to socioeconomics and potentially significant impacts to an environmental justice community.	No significant impacts to socioeconomic or an environmental justice community.
	Cumulative - additional minor beneficial impacts to the environmental justice community.	Cumulative - additional minor beneficial impacts to the environmental justice community.	Cumulative - additional minor beneficial impacts to the environmental justice community.	Cumulative - additional minor beneficial impacts to the environmental justice community.

Resource	Alternative 1	Alternative 2	Alternative 3	No-Action Alternative
Cultural Resources	No significant impacts.	Potentially significant impacts on U&A fishing due to adverse impacts on water resources.	Potentially significant impacts on U&A fishing due to adverse impacts on water resources.	No impacts.
	Cumulative - Additional beneficial impacts due to Puget Sound CERCLA actions.	Cumulative - Additional significant impacts to U&A fishing rights. Additional beneficial impacts due to Puget Sound CERCLA actions.	Cumulative - Additional significant impacts to U&A fishing rights. Additional beneficial impacts due to Puget Sound CERCLA actions.	Cumulative - No significant impact. Additional beneficial impacts due to Puget Sound CERCLA actions.
Noise	No significant impacts.	No significant impacts.	No significant impacts.	No impacts.
	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative - No Significant Impacts.
Utilities and Public Services	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.
	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative - No Significant Impacts.
Hazardous Materials and Wastes	No significant impacts.	No significant impacts.	No significant impacts.	No impacts.
	Cumulative - Potentially significant beneficial impact due to multiple cleanup projects in the area.	Cumulative - Potentially significant beneficial impact due to multiple cleanup projects in the area.	Cumulative - Potentially significant beneficial impact due to multiple cleanup projects in the area.	Cumulative - Potentially significant beneficial impact due to multiple cleanup projects in the area.
Visual Resources	No significant impacts.	No significant impacts.	No significant impacts.	No impacts.
	Cumulative - No significant impacts.	Cumulative - Potentially significant adverse impacts due to the removal of land mass.	Cumulative - Potentially significant adverse impacts due to the removal of land mass.	Cumulative - No impacts.
Recreational Resources	No significant impacts.	No significant impacts.	No significant impacts.	No impacts.
	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative - No significant impacts.
Greenhouse Gases and Climate Change	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.
	Cumulative- No significant impacts.	Cumulative - No significant impacts.	Cumulative - No significant impacts.	Cumulative - No Significant Impacts.

Contents

List of Figures

List of Tables

Acronyms and Abbreviations

AOR	area(s) of responsibility
ARAR	Applicable or Relevant and Appropriate Requirement
ASAOC	Administrative Settlement and Order on Consent
AT/FP	Anti-Terrorism/Force Protection
ATON	Aids to Navigation
Base Seattle	Coast Guard Base Seattle
Base	Coast Guard Base Seattle
BMP	Best Management Practice
BNSF	Burlington Northern Santa Fe Railway
CAP	Cleanup Action Plan
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFE	carbon pollution-free electricity
CFR	Code of Federal Regulations
Coast Guard	United States Coast Guard
COMDTINST	Commandant Instruction
COVID-19	Coronavirus disease 2019
CSTO	Coast Guard Configuration Standard Technical Order
DHS	Department of Homeland Security
ECM	Environmental Conservation Measure
EDDA	Environmental Due Diligence Audit
EE/CA	Engineering Evaluation/Cost Assessment
EEZ	Exclusive Economic Zone
EO	Executive Order
GHGRP	Greenhouse Gas Reporting Program
HISS	Harbor Island Superfund Site
HWAF	Hazardous Waste Accumulation Facility
IBC	International Building Code
IDS	Integrated Deepwater System
IHA	Incidental Harassment Authorization
MITAGS	Maritime Institute of Technology and Graduate Studies
MLLW	mean lower low water
MMT	million metric tons
MT	metric tons
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NTCRA	non-time-critical removal action
NWSA	Northwest Seaport Alliance
OPC	Offshore Patrol Cutter
OU	Operable Unit
PEIS	Programmatic Environmental Impact Statement
POEIS	PEIS/Overseas Environmental Impact Statement
PRP	Potentially responsible parties
PSC	Polar Security Cutter
PV	photovoltaic

RI/FS	Remedial Investigation/Feasibility Study
RPA	Reasonable and Prudent Alternative
SCC	Social Cost of Carbon
SF	square feet
SMA	Shoreline Management Act
SMSA	Seattle Metropolitan Statistical Area
SRKW	southern resident killer whale
TCE	trichloroethene
TMDL	Total Maximum Daily Load
U&A	usual and accustomed
U.S.	United States
UPH	Unaccompanied Personnel Housing
USC	United States Code
USEPA	U.S. Environmental Protection Agency
WCAA	Washington Clean Air Act
WCZMP	Washington Coastal Zone Management Program
WPCA	Washington Pollution Control Act
WSDOT	Washington State Department of Transportation

1 Introduction

The United States (U.S.) Coast Guard (Coast Guard) has prepared this Programmatic Environmental Impact Statement (PEIS) to analyze the potential for significant impacts to the environment from the proposed expansion and modernization of Coast Guard Base Seattle in Seattle, Washington. Base Seattle requires improvements to facilities and infrastructure to address current deficiencies associated with age, general deterioration, and inadequacy to:

- support modern Coast Guard mission execution,
- improve resiliency for earthquakes and other natural disasters,
- strengthen physical security (on-shore and in-water),
- ensure Base Seattle has adequate and appropriate facilities and real property to continue homeporting Coast Guard vessels.

Base Seattle is the main mission support unit for Coast Guard District 13 (Northwestern U.S.) and polar (Arctic and Antarctic) areas of responsibility (AOR)/areas of operation. Because the Base is currently limited in size, land acquisition is required to allow full facilities development, including infrastructure necessary to support future homeported vessels. Land acquisition would also provide space for equipment and materials storage, space for dockside contracted vessel maintenance, improve accessibility to berths and cutters, resolve parking issues and laydown space, and enable flexibility for future expansion of shore-side infrastructure. In the future, paved and parking areas may be used for equipment staging, emergency storage, contractor areas, and other similar or related emergent uses or requirements. Because of the substantial investment required to modernize Base Seattle, the Coast Guard intends to ensure that any improvements at Base Seattle would provide capacity and flexibility to accommodate potential future mission needs.

The environmental impact analysis evaluating the Proposed Action is being conducted in accordance with Council on Environmental Quality (CEQ) regulations to implement the federal National Environmental Policy Act (NEPA) of 1969 (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508) and the Coast Guard Environmental Planning Policy (Commandant Instruction [COMDTINST] 5090.1) (Coast Guard 2019b). The Coast Guard is the Lead Agency for this PEIS and the Washington State Department of Transportation (WSDOT) is a Cooperating Agency.

1.1 Background

The Coast Guard is the principal federal regulatory agency responsible for maritime safety, security, and environmental stewardship of U.S. ports and waterways. As one of the six Armed Services of the U.S., the Coast Guard is the only military branch within the Department of Homeland Security (DHS). In addition to its role as an Armed Service, the Coast Guard is a first responder and humanitarian service provider that delivers aid to people in distress or impacted by natural and human-caused disasters, whether at sea or ashore. The Coast Guard is a law enforcement and regulatory agency with broad legal authorities associated with maritime transportation, hazardous materials shipping, bridge administration, oil spill response, pilotage, and vessel construction and operation.

The Coast Guard operates in all maritime regions:

- Approximately 100,000 miles of U.S. coastline, including inland waterways and harbors
- More than 4.5 million square miles of Exclusive Economic Zone (EEZ) and U.S. territorial seas
- International waters and other maritime regions of importance to the U.S. for missions such as search and rescue, law enforcement, and national defense

1.1.1 Base Seattle

U.S. Coast Guard Base Seattle operates year-round, seven days a week, twenty-four hours a day. It is one of 17 Coast Guard bases located strategically throughout the U.S. and its territories to provide a full spectrum of logistics necessary to support Coast Guard mission execution. Logistics include administrative and personnel support, health, safety and work life, facilities and naval engineering, contracting, and communications and information technology. Located on Puget Sound, Base Seattle is the lead Coast Guard installation providing mission support services to Coast Guard vessels conducting operations in the North Pacific and Arctic and Antarctic operational areas. Base Seattle is an approximately 22-acre site, including 6 acres of submerged land, located where the Duwamish Waterway enters Elliott Bay, just south of downtown Seattle in the industrial South of Downtown neighborhood, and approximately 14 miles north of Seattle-Tacoma International Airport (see Figure 1.1-1). The Duwamish Waterway is an industrialized estuary that connects the Duwamish River to Elliott Bay and the greater Puget Sound and provides Coast Guard vessels access to Base Seattle.

The federal Homeland Security Act of 2002 codified 11 statutory Coast Guard missions:

- Ports, Waterways, and Coastal Security
- Drug Interdiction
- Migrant Interdiction
- Defense Readiness
- Law Enforcement
- Marine Safety
- Search and Rescue
- Aids to Navigation (ATON)
- Living Marine Resources
- Marine Environmental Protection
- Ice Operations

As of August 2019, a total of 1,140 personnel were assigned to Base Seattle, including 539 personnel assigned to Coast Guard cutters, 275 Base staff, and 326 personnel associated with other Coast Guard units located at Base Seattle. Approximately 60 percent of the assigned personnel are active-duty, 30 percent are reservists, and 10 percent are civilian. The number of Base personnel can change as the number of cutters homeported at Base Seattle changes. Base Seattle also provides support to local (the greater Puget Sound Region) military retirees and family members from all branches of the armed forces.

Base Seattle is a highly constrained site with little room for growth or expansion (Figure 1.1-2). The Base is bounded by the Duwamish Waterway to the west and properties owned primarily by the Port of Seattle, including Terminal 46 to the north, Terminal 30 to the south, and the Belknap and Maritime Institute of Technology and Graduate Studies (MITAGS) properties immediately to the east. Marine

cargo operations occur at both Terminals 46 and 30. The Northwest Seaport Alliance (NWSA) operates under a port development authority and manages container, breakbulk, auto and some bulk terminals at the Ports of Seattle and Tacoma. The Coast Guard currently leases the Belknap property from the Port of Seattle for material laydown and parking of government vehicles. The Burlington Northern Santa Fe (BNSF) Railway owns a short rail spur between the Belknap and MITAGS properties. The State of Washington owns most submerged lands in the Puget Sound area, including submerged lands within the Duwamish Waterway. Jack Perry Memorial Park is a 1-acre park with 120 linear feet of public shoreline access owned by the Port of Seattle that is directly south of Base Seattle.

Base Seattle infrastructure includes both shoreside and waterside facilities and structures. Shoreside infrastructure includes 10 buildings, parking areas, roadways, utilities, and security systems (e.g., gates, fencing). Buildings at Base Seattle include Buildings 1, 2, 3, 4, 5, 6, 7, 10, 12, and 14 (Figure 1.1-2). Waterside infrastructure includes Piers 36 and 37, which accommodate berthing for four cutter and floating docks, boathouse, and boat lift for small Coast Guard boats.

With the exception of Building 4 (Shore Operations), the buildings and infrastructure at Base Seattle are beyond their service life, do not meet current standards or Coast Guard requirements, or are otherwise deficient. Most of the buildings at Base Seattle were constructed before 1950 and were originally designed for uses other than the functions they currently support. These building conditions impede the Coast Guard's ability to efficiently execute its missions (U.S. Coast Guard 2006). An infrastructure inventory, additional details regarding deficiencies, and a description of the Base's condition are provided in Appendix A.

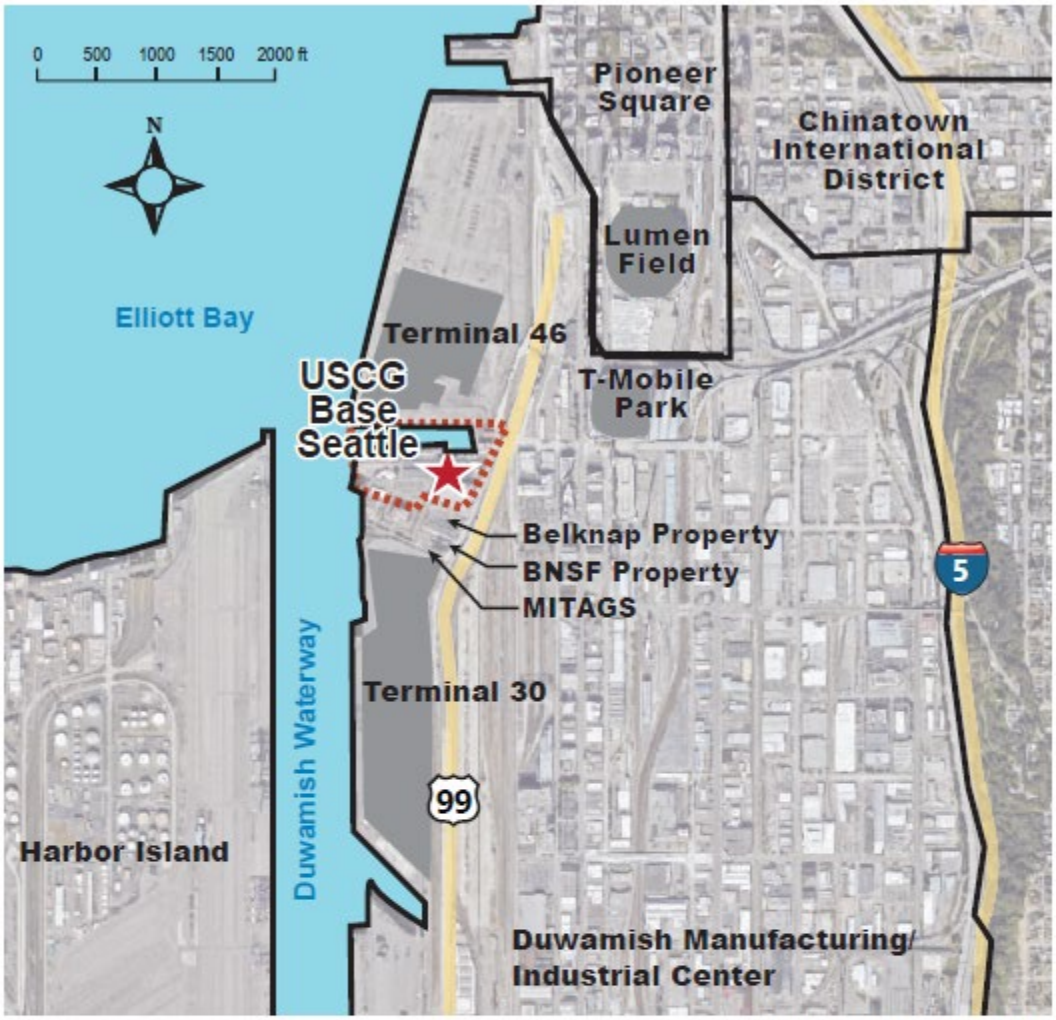
1.1.2 Major Cutter Homeport Functions at Base Seattle

Base Seattle has been the homeport to the Coast Guard's polar ice breakers since 1943. The Base is currently homeport to three Coast Guard ice breaking cutters: POLAR SEA (retired), POLAR STAR, and HEALY. Base Seattle was also previously homeport to two high-endurance Coast Guard cutters: MELLON and MIDGETT. These two cutters have been decommissioned but are still located at Base Seattle as they undergo sale to other countries. In addition, Base Seattle provides waterfront support for small boat operations and provides strategically located shore-side support to transient Coast Guard vessels.

The Coast Guard generally clusters major cutters at key strategic locations, like Base Seattle, to leverage common shore-side facilities and infrastructure requirements and take advantage of economies of scale for personnel and vessel support requirements. Of the 17 Coast Guard bases in the U.S., only Base Seattle is located on or near Puget Sound or the Pacific Northwest. For these reasons, the Coast Guard expects Base Seattle to continue to operate as a critical Coast Guard installation and major cutter homeport location to support mission execution throughout the Pacific Northwest and polar AORs.

The Coast Guard will continue to operate Base Seattle as a strategic port for future major cutter operations to support the Coast Guard icebreaking mission and Arctic Strategy. The projected Base Seattle mission includes serving as homeport for three new Polar Security Cutters (PSCs) once they are manufactured. The Coast Guard is also considering Base Seattle as a future homeport for four additional major cutters, although no decision has been made at this time. As part of the Coast Guard's Strategic Plan, the objective is to maximize readiness for today and tomorrow (Coast Guard 2018). Specifically, the strategic plan specifies the need to modernize shore infrastructure to support mission execution programs. Coast Guard priorities include repairing or replacing degraded shore infrastructure that negatively impacts operations or hinders workforce readiness. Due to the magnitude of investment

Figure 1.1-1 Regional and Local Vicinity



Source: City of Seattle 2020

Regional and Local Setting

FIGURE
1.1-1

Figure 1.1-2 Site Map

Existing Facilities

1. Base Admin
2. Exchange
3. Industrial Shops and Gym
4. CG Sector Puget Sound
5. Museum
6. UPH / Galley
7. Warehouse
10. ANT-Seattle shops
12. Magazine
14. Hazmat Pharmacy
19. Security Gate / Access Gate
20. Secondary Access Point

Site Map

FIGURE
1.1-2

needed at Base Seattle, the Coast Guard has prioritized developing and employing a shore infrastructure management system that anticipates future requirements and incorporates long-term capabilities and capacity in major shore infrastructure investments.

1.2 Scope of this PEIS

The scope of this PEIS analysis focuses on the proposed modernization of Base Seattle to include expansion and/or renovation and upgrade of facilities and infrastructure at the Base. These actions are needed to address current deficiencies attributed to old, outdated, and deteriorated facilities, accommodate proposed growth, and modernize and enhance the Base to provide adequate and necessary infrastructure to support current and future cutters and missions.

Modernization and renovation efforts would ensure operational and mission support requirements are properly provided and enhance the resiliency and long-term sustainability of Base Seattle's facilities and infrastructure. Planning with future mission flexibility in mind also minimizes the need for costly future infrastructure modifications and the resulting environmental impacts.

Base facilities and infrastructure improvements represent a long-term development program that will require a multi-year capital investment strategy. Because many of the modernization and renovation actions are largely conceptual at this time, the analysis in this document is necessarily programmatic. Specific projects may require additional NEPA evaluation and compliance with other environmental laws and regulations when they are programmed for implementation.

Future decisions to homeport major cutters at Base Seattle, as well as the fate of cutters currently homeported at Base Seattle, are independent actions from the modernization program evaluated in this PEIS and therefore these actions are not within the scope of the PEIS analysis. The modernization program does account for up to eight major cutters homeported at Base Seattle by including necessary and appropriate shoreside support facilities in the long-term development program, including providing berthing space for up to eight major cutters. It should be noted that vessels currently homeported at Base Seattle could remain at Base Seattle, be relocated to other Coast Guard facilities, or be decommissioned upon arrival of new cutters at Base Seattle.

The EPA is the lead agency for a potential removal of contamination in Slip 36 at Base Seattle under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Since the Coast Guard is not the lead agency, and the project is being completed under CERCLA (exempt from NEPA), this action is independent of the Base Seattle modernization. In the future the Coast Guard may decide to homeport additional major cutters at Base Seattle. At this time there is not enough information known to evaluate the impacts under NEPA. It is unknown if additional cutters would be homeported, which cutters could be homeported, the cutter operational/maintenance requirements, and the timing of potential impacts. Additional NEPA analyses will be required If the Coast Guard proposes to homeport additional cutters. Since the CERCLA project is exempt from NEPA and homeporting of additional major cutters is not ripe for analysis, they are not considered as part of the Proposed Action. The Coast Guard recognizes that both of these actions may relate to the overall modernization program at Base Seattle and result in a greater change to the environment when considered together. They are evaluated as part of the cumulative impacts analysis in Section 4 of this PEIS.

1.2.1 Coast Guard Major Cutter Acquisition Programs

To ensure the Coast Guard is ready for today's challenges while preparing for tomorrow's threats, it must modernize its shore-side infrastructure to meet operational and support requirements of current and future afloat assets (e.g., major cutters). Future mission success relies on continual recapitalization of boats, cutters, aircraft, and infrastructure. The Coast Guard is currently engaged in several multi-year investment strategies to modernize its operational assets and provide the shore-side infrastructure required to operate and support these assets. Implementing these investment strategies requires modernization, and capability and capacity enhancements in Coast Guard shore infrastructure in locations such as Base Seattle. The Coast Guard has separately prepared two PEISs and is preparing a third PEIS to evaluate potential environmental impacts from the proposed acquisition and operation of new major cutters, as described further below. The programs analyzed in the separate PEISs may result in additional ships homeported or making port calls at Base Seattle. The number and types of ships are unknown at this time. These actions are independent of the Proposed Action addressed in this PEIS allowing these actions to be implemented without the modernization of Base Seattle. They are included, as appropriate, in the Cumulative Impacts analysis in Section 4.

Polar Security Cutter (PSC) Acquisition Program Final PEIS. The Final PEIS for the PSC Acquisition Program was completed in March 2019. It evaluated the potential impacts from the acquisition and operation of a new class of polar icebreakers; the PSC (Coast Guard 2019a). The PEIS evaluated how operations and training activities associated with the PSC Acquisition Program could potentially impact human and natural resources in the polar environment (i.e., Arctic and Antarctic). The Record of Decision for the action was published in the Federal Register on April 3, 2019 (Federal Register 2019).

Final PEIS for the Integrated Deepwater System Project. The Final PEIS for the Integrated Deepwater System (IDS) was completed in 2002 (Coast Guard 2002). The IDS PEIS evaluated potential impacts from the acquisition and operation of new Coast Guard vessels and aircraft on a broad, regional level, to include impacts of Coast Guard cutter operations in Pacific waters. The Record of Decision for this action was published in the Federal Register on June 24, 2002 (Federal Register 2002).

PEIS/Overseas Environmental Impact Statement for the Offshore Patrol Cutter Program's Stage 2 Acquisition. A Notice of Availability for the PEIS/Overseas Environmental Impact Statement (POEIS) for the continued acquisition and operation of Offshore Patrol Cutters (OPC) was published on September 20, 2021. Under the proposed action evaluated in the OPC PEIS/POEIS, the Coast Guard would acquire up to 21 additional OPCs and operate a total of up to 25 OPCs. Homeport locations for OPCs acquired under this program have not yet been determined.

1.2.2 Comprehensive Environmental Response, Compensation, and Liabilities Act Action at Base Seattle

The waters between Piers 36 and 37 at Base Seattle are referred to as Slip 36, which connects to the East Waterway of the Duwamish River and to Elliott Bay and Puget Sound. The Coast Guard is conducting a non-time-critical removal action (NTCRA) in Slip 36 under an Administrative Settlement and Order on Consent (ASAOC) with the U.S. Environmental Protection Agency (USEPA). The current ASAOC requires the Coast Guard to conduct an Engineering Evaluation and Cost Assessment (EE/CA) to determine what, if any, action is appropriate to address contamination under the NTCRA. The Coast Guard and USEPA have been evaluating contamination within Slip 36 since 1984 and, based on an investigation conducted in 2019 as part of a federal Clean Water Act Section 404 permit, determined an EE/CA is appropriate for this site. USEPA evaluated this information and concurred through an EE/CA Action Memorandum (USEPA 2021a).

The EE/CA will evaluate removal alternatives that advance the cleanup of Operable Unit (OU) 10 of the Harbor Island Superfund Site (HISS), known as the East Waterway. USEPA has previously directed a coalition of potentially responsible parties (PRP) to conduct a Remedial Investigation/Feasibility Study (RI/FS), which evaluated a full suite of remedial alternatives. The Coast Guard will use these alternatives, and potentially others, to evaluate removal actions that may be appropriate to address contamination at the Slip 36 site. Should USEPA select a removal alternative(s) other than "No Action" in an Action Memorandum, the Coast Guard will implement the action(s). Actions considered shall address contaminate mass and source control while allowing the Coast Guard to continue to execute its federally mandated missions.

The Coast Guard and USEPA will follow the guidelines set forth in the federal CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) for NTCRAs. Both laws require public engagement efforts and the implementation or waiver of Applicable or Relevant and Appropriate Requirements (ARARs). As NEPA is an administrative requirement, and the CERCLA and NTCRA processes substantively fulfill the NEPA requirements, this PEIS will not consider actions that are implemented as part of the forthcoming Slip 36 NTCRA. Actions in Slip 36 that are not considered in the EE/CA and subsequent USEPA Action Memorandum will be evaluated under NEPA (40 CFR §1501.1). Slip 36 and the estuarine sediments beneath Pier 36 are within the administrative boundary of HISS OU 10. The OU addresses hazardous substance releases from historic activity within the HISS boundary. OU 10 is under the regulatory jurisdiction of USEPA Region 10 pursuant to CERCLA, as amended; 42 USC §9601 *et seq*.; and the NCP, Hazardous Substance Response, 40 CFR §300.400 *et seq.*

Pursuant to Section 10(d) of the U.S. Coast Guard Environmental Planning Policy at COMDTINST M5090.1 and 40 CFR §1500.6 of the CEQ NEPA regulations, the Coast Guard will address NEPA concepts (e.g., analysis of off-site, ecological, and socioeconomic impacts) to the extent practicable in CERCLA documents and will follow CERCLA public involvement requirements; therefore, these actions are not within the scope of this PEIS. In addition to CERCLA action underway at Slip 36, other CERCLA removal actions would likely be required under the different action alternatives evaluated in the PEIS. Please see Section 2.4 for further details on assumptions made with respect to potential CERCLA actions to define the scope of the analysis in the PEIS.

1.3 Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to provide adequate and efficient facilities and infrastructure at Base Seattle to support the Coast Guard's execution of its current and future statutory missions, pursuant to 14 USC §102. This is consistent with the Coast Guard's Strategic Plan. Base Seattle is the largest Coast Guard installation in the Pacific Northwest and is an essential facility to support Coast Guard missions in the Pacific Northwest and polar regions (Arctic and Antarctic), now and for the foreseeable future. To support Coast Guard mission execution throughout these AORs, Base Seattle requires extensive modernization and renovation of facilities and infrastructure.

The Proposed Action is needed to address substantial existing deficiencies with facilities and infrastructure at Base Seattle that hamper the efficient execution of Coast Guard missions. Facility enhancements are also necessary to support current and future major cutters homeported at Base Seattle. Replacing legacy ice breakers and other major cutters homeported at Base Seattle with modern major cutters would require infrastructure enhancements and renovations to accommodate the enhanced size and shore-side utilities support requirements associated with these advanced operating assets. The Coast Guard has identified deficiencies that include, but are not limited to, resolving incompatible land uses, increasing berthing capacity, upgrading existing facilities and infrastructure,

reducing congestion and parking shortfalls, providing a safer work environment, enhancing physical on-shore and in-water security capabilities, and providing new infrastructure, as necessary.

1.4 Public Outreach

1.4.1 Scoping

In accordance with the CEQ NEPA regulations at 40 CFR Part 1503, a public scoping period for the PEIS began on May 7, 2021, to solicit input from affected federal, state, and local agencies; affected Indian tribes; and other interested individuals and stakeholders that will help define and refine issues to be addressed during PEIS development. The scoping period began with publication of a Notice of Intent (NOI) in the Federal Register (Vol. 86, No. 87) on May 7, 2021, and continued for 45 days, concluding on June 21, 2021 (see Appendix B). The public was further notified of the PEIS scoping period by publication of an NOI in The Seattle Times (see Appendix C).

Due to restrictions on public gatherings resulting from the 2019 coronavirus disease (COVID-19) pandemic, the Coast Guard did not conduct an in-person scoping meeting. A virtual scoping presentation was provided for the duration of the public scoping period at https://virtual.woodplc.com/VirtualSpace/102907 to afford the public and all other interested parties sufficient time to review the scoping materials and provide comments for the Coast Guard to consider when developing the Draft PEIS.

The Coast Guard received 26 scoping letters from interested parties. In accordance with the CEQ NEPA regulations at 40 CFR §1502.17, comments received during the scoping process and considered by the lead and cooperating agencies while developing the Draft PEIS are included in Appendix D. The following overarching issues were identified in the comments:

- Displacement of MITAGS facility
- Loss of coastal access/park space
- Impacts on socioeconomic activity (including employment) specific to industrial and marine related infrastructure and operations resulting from land acquisition
- Environmental justice and potential impacts to marginalized communities
- Vessels, vessel traffic, vessel movement, dry dock capacity, and water-side Port of Seattle operations
- Land use and traffic conflicts with surrounding uses (e.g., stadiums, Pioneer Square, Chinatown-International District)
- Traffic impacts, including additional trips, trip distribution, and peak traffic periods on local road networks, as well as cumulative effects with ongoing and future construction projects on the Seattle waterfront
- Nexus with sediment cleanup and source control associated with HISS
- Zero or low-impact development techniques in project design
- Construction-related air and noise emissions and their impacts on nearby sensitive receptors
- Potential impacts to federally listed species and their critical habitats, including impacts to marine mammals and fish species
- Potential effects to Indian tribes regarding treaty rights and usual and accustomed (U&A) fishing areas
- Risk of accidental spills; prevention, preparedness, and response measures; and other potential impacts to water quality
- Consideration of geological and seismic conditions in the waterfront area

1.4.2 Draft PEIS

In accordance with the CEQ NEPA regulations at 40 CFR §1502.20 and 40 CFR §1506.11, the Draft PEIS is being released for public review. Release of the Draft PEIS was announced with issuance of a Notice of Availability in the Federal Register.

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2 Description of Proposed Action and Alternatives

2.1 Introduction

This chapter presents details of the Proposed Action and alternatives, including the No-Action Alternative. Guidance for complying with NEPA—established by CEQ and implemented by the Coast Guard Environmental Planning Policy at COMDTINST 5090.1 —requires an assessment of effective and feasible alternatives to implement the Proposed Action. Alternatives that were identified but dismissed as not viable, including alternate improvements and configurations, are not carried forward for detailed analysis. These alternatives are identified in Section 2.6, *Alternatives Considered but not Carried Forward*. Only alternatives that meet the screening criteria and the No-Action Alternative are addressed in this PEIS.

2.2 Alternative Screening Process

The Coast Guard relied on a strategic planning process to develop proposed facilities and infrastructure reconfiguration requirements at Base Seattle. The process considered ways to remedy existing deficiencies (see Appendix A) and meet current and future mission requirements. The planning process also considered the technical feasibility and affordability of each action.

2.3 Screening Criteria

As part of the planning process and CEQ NEPA regulations at 40 CFR §1502.2, the Coast Guard established screening criteria to develop the range of reasonable alternatives carried forward for analysis. Screening criteria reflect the minimum threshold requirements to meet the purpose and need, as defined in Section 1.4. As reflected in several of the screening criteria, the alternatives must be technically and economically feasible. Each alternative carried forth for analysis was developed using the screening criteria and the proposed layout of land parcels and/or existing berthing to help determine the footprint for the Proposed Action. These proposed alternative layouts are described in greater detail in Section 2.5. Public scoping comments were reviewed and considered in development of the screening criteria.

The Coast Guard used the following screening criteria when determining if an action alternative would be reasonable:

Operational Requirements:

- Minimize potential impacts to operational effectiveness during construction.
- Provide facilities that enhance operational effectiveness.
- Implement individual projects that will support current Pacific and polar operations/AORs and position the base for future operational capabilities.
- Provide facilities that meet Coast Guard Anti-Terrorism/Force Protection (AT/FP) stand-off distances and Coast Guard security requirements, both on-shore and in-water.
- Would not obstruct vessel movement in the Lower Duwamish waterway.
- Provide a base layout which relieves the current internal circulation constraints.
- Consolidate Coast Guard functions to ensure mission cohesiveness and flexibility.

Facilities and Infrastructure Requirements:

- Provide facilities that meet the established requirements for shore infrastructure for current and future major cutters and small boats, as identified in the *Coast Guard Field Planning for Shore Infrastructure* manual (Coast Guard 2007).
- Provide adequate land area to enable the development of facilities in a manner that permits the efficient and effective support of Coast Guard missions and with the flexibility to accommodate future mission needs. This may require Coast Guard to acquire adjacent real estate to accommodate an expanded footprint.
- Provide adequate berthing space that meets the following criteria:
    - Facilities must provide six berths for up to eight major cutters and provide space for operational flexibility.
    - Berths and facilities may be developed through renovation, reuse, and/or new construction.
    - Berths must not obstruct existing navigation channels.
    - Mean lower low water (MLLW) depth must be adequate to accommodate berthing of existing and future major cutters (PSCs will have a draft of 36.5 feet).
- Provide infrastructure and facilities that are compliant with applicable codes and standards (e.g., health and safety, tsunami, seismic events).
- Provide Coast Guard-required personnel support services (e.g., berthing for unaccompanied personnel [136 bed requirement], personnel support, healthcare, parking).
- Configure land uses with compatible facilities and cluster elements with similar mission requirements together for operational efficiency.
- Ensure projects do not impede the CERCLA clean-up action in Slip 36.
- Ensure adequate space for laydown of materials and other necessary operations.

Economic Considerations:

- Ensure construction timelines are flexible but begin when necessary to accommodate the proposed arrival dates for major cutters.
- Minimize long-term costs for facility construction, maintenance and repair, operations, and real property leases.
- Reduce construction and maintenance costs by centralizing and sharing facilities.

Environmental Impacts:

- Avoid, minimize, or mitigate potentially significant impacts to the environment to the greatest extent practicable.

2.4 Proposed Action

The Coast Guard has determined the requirements to modernize and upgrade existing facilities and infrastructure at Base Seattle. These requirements include resolving incompatible land uses, increasing berthing capacity, upgrading existing facilities and infrastructure, reducing congestion and parking shortfalls, providing a safer work environment, enhancing physical security capabilities, and providing new infrastructure, as necessary. To that end, the Coast Guard has developed strategies to acquire land, demolish existing structures and construct new structures, expand and upgrade infrastructure, and meet safety and building codes necessary to support Coast Guard missions and the associated personnel at Base Seattle.

The Proposed Action to modernize and enhance facilities at Base Seattle comprises three specific categories of actions: (1) land acquisition; (2) construction, which includes demolition, rehabilitation, and renovation; and (3) long-term operations. The resource analyses in Chapter 3 provide a description of the potential impacts associated with each of these actions.

Actions within each of the above categories, may also have an element of timing and known or available information for completing the impact analysis." Change to "The timing for each of the categories of actions vary. The three timing elements include: (1) near-term actions; (2) future actions; and (3) actions occurring throughout the program. Additionally, the level of detail in the description of each alternative varies. This is because there are not reasonable assumptions that can be made for some aspects of the alternatives. If Alternatives 2 or 3 would be implemented, there would most likely be a larger CERCLA non-time critical removal action. The extent of which is unknown and would highly influence the amount and type of construction that is necessary to develop new berthing spaces noted in Section 4.

The first element includes specific actions that would occur in the near-term and for which details are known, such as required land acquisition. These actions are evaluated at a project-specific level in the PEIS and would likely be undertaken soon after the PEIS is completed.

The second element includes future actions that are required to address an identified need that would occur later and for which design details are not yet known, such as construction of a new Mission Support Building and a new Base Administration Building. The PEIS evaluates the potential environmental effects of these actions at a programmatic level. These actions may require subsequent NEPA review and compliance with any other applicable laws and regulations once these actions have been programmed for funding and design details are sufficiently developed to support evaluation.

The third element includes general actions that would occur throughout the modernization program, such as support projects, support activities (e.g., maintenance and repair), and temporary establishment or relocation of facilities and functions. These actions may be identified as the program develops and may require subsequent NEPA review and compliance with any other applicable laws and regulations.

For the purposes of informing the public and the decision-maker, the Coast Guard has made reasonable assumptions, where possible, as to what work would be conducted under the Proposed Action. These reasonable assumptions serve the purpose of providing a greater understanding of what impacts could occur should the Proposed Action be implemented. **Please note that these assumptions are based on the best available information at this time and changes to the Proposed Action may be required in the future given changes in mission priorities or funding, or further refinement of the extent of work under the CERCLA removal action. In compliance with CEQ's NEPA regulations, the Coast Guard would either tier to this PEIS or supplement the analysis, as appropriate.** Relevant work would occur in three locations and is presented under one or more alternatives described below: Slip 36, Terminal 46, and Pier 35 (refer to Figure 1.1-2).

Slip 36 – Slip 36 is within HISS OU 10 and is the area subject to the removal action the Coast Guard is currently undertaking under the ASAOC. The Slip 36 (HISS OU10) CERCLA removal action may include removal of contaminated sediment in Slip 36 and the work necessary to address source materials for contamination, stabilize the shoreline as contaminated sediment is removed, and replace functional use of the piers that are removed or destabilized as part of the removal action to allow for continued Coast Guard operations. This may include shoreline or portions of the slip found to be at risk for a future

release. For the purposes of the PEIS, it is assumed that the CERCLA removal action would, in addition to the removal of contaminated sediment, include:

- demolition and replacement of Pier 36B (sources of contamination in Slip 36),
- demolition of Building 3 (sits atop Pier 36B),
- demolition and replacement of the small boat facilities (located within Slip 36),
- certain in-water work to be defined by the EE/CA (e.g., installation of pilings, sheet piles, sediment stabilization).

In-water work as part of the CERCLA removal action would include actions necessary to maintain the integrity of the removal action area and, as such additional in-water work may be necessary if it is required to preserve Coast Guard operations and functions at Base Seattle. EPA is the lead agency for all CERLCA actions and will determine the appropriate removal alternatives through the CERCLA process.

No work beyond that to be conducted as part of the Slip 36 CERCLA action is currently planned at Slip 36; therefore, the Proposed Action in the PEIS does not include any actions in Slip 36.

Terminal 46 – In 2020, on behalf of the Coast Guard, Appledore Marine completed an inspection and assessment of structural conditions at the southern end of Terminal 46. Appledore Marine divided the area into four distinct areas – Areas 1, 2, 3, and 4 – based on the date of construction and material type. Appledore Marine then evaluated structure configuration, construction materials, age, and remaining service life of the four areas. Area 1 is a timber structure located in the southeast corner of Terminal 46, 3,800 square feet (SF) with timber piles. Area 2 is a concrete structure with precast concrete piles 1,020 feet long and occupying 3.4 acres. Area 2 has been determined to have a remaining functional service life of 10 years and additional evaluation was recommended to determine the need for rehabilitation or replacement. Area 3 is a deteriorated timber structure located at the southwest end of the property. It is supported by timber piles and covers approximately 10,000 SF. Area 4 is a concrete wharf comprising 54 pre-stressed concrete piles, concrete pile caps, and deck planks covering approximately 6,000 SF. The need for rehabilitation was not known (Appledore Marine Engineering 2020).

The southern end of Terminal 46 is within or adjacent to HISS OU 10. The limits of HISS OU 10, the extent of contamination in this area, and details of future work at Terminal 46 are not currently known. For purposes of this analysis, it is assumed that rehabilitation of Areas 1, 2, 3, and 4 of Terminal 46, as described below and shown in Figure 2.5-2, would not be conducted as part of a CERCLA removal action and, consequently, this work is part of the Proposed Action analyzed in the PEIS. Should all or part of this work be required to be conducted under CERCLA, the removal action would likely include removal of contaminated sediment. Additional work may be conducted to address any contamination in source materials, as required, to stabilize shorelines as contaminated sediment is removed, and, if necessary, to replace/restore the pier's functional use for Coast Guard operations.

Piers 35E/F – Proposed Piers 35E/F would be within the HISS OU 10 and therefore it is assumed that a CERCLA removal action would be required prior to conducting any in-water work in this area. **Please note that the Coast Guard is not currently proposing to undertake a CERCLA removal action at the proposed location of Piers 35E/F, but such an action is assumed for the purposes of defining the scope of the PEIS analysis.** Should the Coast Guard choose to pursue an alternative that includes work at potential future Piers 35E/F, the Coast Guard would be required to enter into an agreement with USEPA for a CERCLA removal action. Similar to the ongoing Slip 36 NTCRA, the Piers 35E/F CERCLA removal action would include removal of contaminated sediment in the Piers 35 E/F area and may include other actions with a nexus to the contamination. For PEIS purposes, it is assumed that this CERCLA removal

action would, in addition to the removal of contaminated sediment, include removal of any source material and certain in-water work (as defined by a future EE/CA) necessary to maintain the integrity of the removal action area, or because this work would impact or functionally intersect with other infrastructure in the removal action area that is required to preserve Coast Guard operations and functions at Base Seattle.

While much of the in-water work to develop Piers 35E/F is not part of the Proposed Action evaluated in the PEIS, the Coast Guard does consider the potential impacts of construction of Piers 35E/F as part of the cumulative impacts analysis in the PEIS (Chapter 4) to more fully inform decision-makers and the public of potential impacts. The full scope of a removal action at this location is not known at this time; therefore, the Coast Guard can only assess potential impacts of wharf construction qualitatively. Further NEPA documentation would be required for development of Piers 35 E/F; the extent of such NEPA analysis would be dependent upon the extent of the CERCLA removal action.

2.5 Alternatives Carried Forward for Detailed Analysis

The alternatives development and screening process identified proposed construction and personnel sequencing and phasing that would minimize disruption of active, ongoing operations at the Base and other regional Coast Guard activities. Three alternatives met the screening criteria and are carried forward for detailed analysis in this PEIS – Alternative 1: Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative), Alternative 2: Modernization with Additional Land from Terminals 30 and 46, and Alternative 3: Modernization with Additional Land and One Berth at Terminal 46. All three action alternatives would provide for two additional ship berths for a total of six proposed berths at Base Seattle.

Specific building locations, infrastructure improvements, functional configurations, and real estate transactions were considered to account for land use, environmental hazards, and operational considerations. Construction, renovation, and upgrade of facilities and infrastructure would be accomplished in accordance with Coast Guard standards for new buildings.

Future Coast Guard missions may require the capacity and capability to homeport up to eight major Coast Guard vessels (i.e., cutters) at Base Seattle. This would provide the Coast Guard maximum operational flexibility, now and into the future. While it is known that some PSCs will be homeported at Base Seattle, the timing of these homeports is still unknown because the PSCs are still under construction. Homeport sequencing for other major cutters is pre-decisional as to if, when, and which major cutters could or may be homeported at Base Seattle. Homeporting decisions for new and modern Coast Guard cutters are still being determined and future sequencing of these decisions is dependent on changing and emerging mission requirements and priorities and the need for mission execution flexibility. To that end, major cutter homeporting decisions continue to be assessed.

In addition to the proposed infrastructure modernization, the Base Seattle population would increase from 1,140 to an estimated 1,900 personnel (albeit in the near term, there may be a reduction in the population at Base Seattle down to approximately 800 personnel, as old cutters are decommissioned and replacement/new cutters have not yet arrived). This projected population growth at the Base includes the following:

- Crews and maintenance support personnel assigned to the new homeported cutters
- Relocation of an estimated 197 Coast Guard personnel currently housed in the Jackson Federal Building in downtown Seattle
- Additional support staff to provide adequate service needs to meet the demand of the expanded footprint and increased population at the Base

In addition to assigned personnel at the Base, the Coast Guard maintains sustainment contracts with dockside trade workers and contractors who maintain vessel readiness. These workers include electricians, machinists, mechanics, inspectors, and other trades workers (these contracts include specialized systems such as electronics, machinery control, and navigation). It is assumed that each Coast Guard vessel would undergo a single sustainment event each year to conduct maintenance and resupply activities, and each sustainment event is expected to require approximately three months to complete. Based on the size and complexity of each vessel type, the Coast Guard estimates that at full program implementation, a daily average of 235 contractors would be required to support single sustainment events. If three sustainment events were to occur simultaneously, the daily average requirement for contractors would be 705, which represents a 482-person increase over the current daily average.

Several elements of the Proposed Action to modernize Base Seattle are common to all of the action alternatives but vary as they relate to the different land acquisition and land development scenarios under each of the alternatives. A summary of the key elements of each action alternative is provided in Table 2-1 followed by a detailed description of each action alternative. These common elements include the following:

Construction – All action alternatives include demolition, rehabilitation/renovation, and construction of certain structures. The following construction-related components are common to all alternatives:

- **Demolition** of Buildings 1, 2, 2 Annex, 6, 10, 12, and 14.
- **Demolition or Renovation** of Building 7. Building 7 would be either renovated or demolished and replaced with new construction on acquired property. Building 7 does not meet mission requirements, as well as current building codes and seismic standards. The decision on the future of Building 7 would be made following further evaluation of cost and engineering feasibility for renovation. In the near-term Building 7 would be retained to provide interim space for Coast Guard functions that are displaced by the CERCLA removal action at Slip 36, including the demolition of Building 3. If the Coast Guard determines that Building 7 must be demolished, it is anticipated that Coast Guard would need to acquire an additional 8 acres to accommodate replacement of the functions currently housed in Building 7. This additional acreage is accounted for in the acquisition acreages proposed under each of the action alternatives described below.
- **Rehabilitation/Renovation** of Terminal 46. The four areas of the southern portion of Terminal 46 are based on the date of construction and material type (see Section 2.4). All four areas of Terminal 46 are assumed will require replacement. Designs for replacement structures have not been developed. For the purposes of the PEIS analysis, it is assumed that replacement structures would be standard concrete piles, girders, beams, and decking, similar to the existing and surrounding pier structures, with no net increase in square footage. Existing piles would be removed, including creosote timber piles in Areas 1 and 3.
- **Construction of the following:**
    - Mission Support Building – a 3-story, approximately 136,000 SF building to house functions currently located in Building 2, Building 2 Annex, and Building 6 (all proposed for demolition)
    - Base Administration Building – a 3-story, approximately 31,000 SF building to house functions currently located in Building 1 (proposed for demolition)
    - New Buildings 12 and 14 – existing Buildings 12 and 14 would be demolished and reconstructed in new locations with no change in size or function

- New Building 7 (if the recapitalization of the existing Building 7 is not feasible) – an approximately 363,000 SF building to house functions currently located in Building 7 and Building 3 (Building 3 would be demolished under the CERCLA action as previously noted)

Utility Replacement, Upgrade, and Modernization – Existing utilities are deficient and do not meet current codes. All utilities, including communications (e.g., telephone, data, video), electrical, natural gas, sanitary sewer, potable water (includes fire protection water supply), and storm sewer would be replaced to address current deficiencies, to accommodate new development and land use patterns, and to improve reliability and resiliency. Replacing and upgrading these utilities would include excavating utility corridors, replacing utility lines (each estimated to average 3,500 linear feet), installing power poles, installing lift and pump stations, and installing pier-side power mounds (shoreside power supply that negate need for vessels to operate engines while in port) and utility vaults. Existing utilities would be extended to relocated infrastructure and/or piers, and a new, base-wide public address system would be installed for daily operational and emergency announcements. Removing and replacing fueling systems and related storage systems would also occur. All connections would be within the expanded Base boundaries. These utility systems upgrades would be located in accordance with the pattern of development under each action alternative.

Seismic Soil Stabilization – Base Seattle is located on artificial fill and structurally weak soils that are susceptible to liquefaction during earthquakes. Seismic soil stabilization to ensure structural integrity and public safety would be implemented by installing stone (or aggregate) columns, vertical or horizontal grouting, or deep soil mixing with amendments. It is anticipated that installing stone columns would be the most likely method of soil stabilization at Base Seattle and would be accomplished via top-feed or bottom-feed caisson replacement. Both methods involve installing a steel casing, filling the casing with aggregate material, and securing that material with compaction (National Highway Institute 2017). It is anticipated that as many 1,000 stone columns would be installed within the current Base boundaries and any acquired land. Each column would be approximately 100 feet deep, 3 feet in diameter, and spaced 6 feet on center. It is assumed the columns would likely be installed in a grid pattern set back approximately ten or more feet from sheet pile walls; however, specific locations would be based on future geotechnical analysis and infrastructure design development.

Upgrades to Base Security – The Coast Guard would install new security fencing around the Base in accordance with the land acquisition and subsequent pattern of development under each of the action alternatives. The main entrance gate would remain in place, but it would be upgraded to meet current standards and AT/FP requirements, including security barriers, sensors, and overhead lighting.

An existing secondary gate at the northeastern corner of the Base, west of the intersection of Alaskan Way South and South Atlantic Street, is currently used for truck traffic and materials delivery. The Coast Guard would also upgrade this gate. Further, the gate would be available to Base commuters during morning hours and to truck traffic throughout the day. The Coast Guard would develop an associated gatehouse within Base boundaries to prevent off-base queuing. The gate house would meet current standards and AT/FP requirements.

Expanded Parking and Flexible Use Space – Each alternative scenario provides land acquisition for operational use space and expanded parking. Operational use space is required for vessel safety and AT/FP buffers, vessel maintenance and support, materials storage, equipment movement, and emergency use.

Expanded parking and associated vehicle circulation would address current parking deficiencies and parking requirements for daily commuting personnel, additional cutter crews, contract personnel, and Coast Guard personnel currently located off-base who would be relocated to Base Seattle. The Base currently lacks adequate long-term parking for deployed personnel. This deficiency is currently addressed by use of parking at the Navy's Family Support Complex in Marysville, Washington, near Naval Station Everett, approximately 43 miles north of Seattle. Expanding Base Seattle parking capacity would eliminate the need for remote parking at the Navy's Family Support Complex (and the round-trip traffic involved). Current planning for parking capacity assumes that, upon program completion, two cutters will generally be deployed at any one time. Parking is estimated to be available for 80 percent of personnel under an eight-cutter homeport scenario. Less than half of the acquired property would be used for parking and vehicle circulation. Under each action alternative, parking, circulation, and flexible use space would generally be provided in expanded areas to meet these needs while reducing congestion and improving traffic and materials movement within the Base footprint.

Repair of Internal Road Surfaces, Hardscaping, and Landscaping – The Coast Guard would replace or repair all internal roads, hardscape features (e.g., curbs, sidewalks), and landscaped areas following execution of various actions such as building construction or utility replacement.

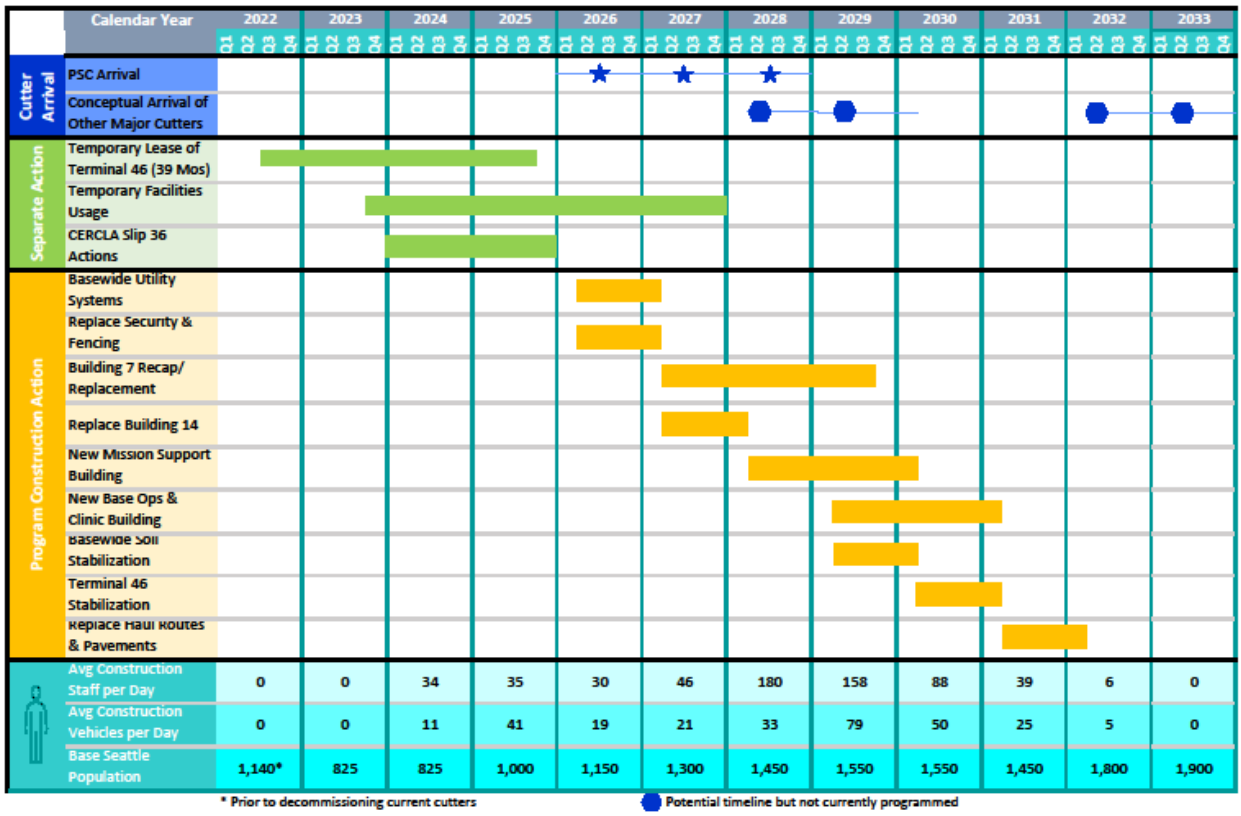
Construction Phasing and Execution – Conceptual construction sequencing for overall program buildout and the arrival of potential major cutters and personnel (the same under all action alternatives) are presented in Figure 2.5-1. The timing for executing these program elements is based on current Coast Guard planning and operational needs. These timeframes may change based on factors such as funding and evolving federal government priorities. As such, it is possible the schedule identified for some of these projects could shift over the course of the program. This may result in a shift in the estimated maximum period of work, or an extension of the work over a longer period of time. An extension would reduce the intensity of construction activities. These timelines provide the framework for the analysis and reflect a potential maximum intensity of activity on the Base.

It is assumed that all construction and site development activities would include use of standard construction processes (i.e., demolition, materials delivery, concrete placement) and equipment (i.e., trucks, backhoes, cranes, power tools). Details on construction activity and timing will not be available until specific projects are funded and contracted; however, a list of anticipated demolition and construction equipment required for program implementation is presented in Appendix J.

Sustainability – In accordance with applicable laws and regulations, Coast Guard policy (Coast Guard 2014), and Coast Guard guidance (Coast Guard 2020), the Coast Guard would include design elements to enhance sustainability and improve resiliency in future construction. Additionally, the Coast Guard would conduct construction in accordance with the Guiding Principles for Sustainable Federal Buildings and Associated Instructions (CEQ 2020) or applicable guidance at the time of construction. The Guiding Principles provide agencies with a means to meet statutory provisions relating to high-performance sustainable buildings. The Guiding Principles ensure federal buildings:

1) employ integrated design principles,
2) optimize energy performance,
3) protect and conserve water,
4) enhance the indoor environment,
5) reduce the environmental impact of materials,
6) assess and consider building resilience.

Figure 2.5-1 Conceptual Construction and Personnel Sequencing



Because the Coast Guard is only in the programmatic level of planning for Base Seattle modernization, it has not initiated detailed design for any future construction projects. Future planning and designs would consider a wide range of design features, such as including on-site renewable power generation (e.g., photovoltaic [PV]), electrical vehicle charging infrastructure, PV carports, battery storage, and other energy and water conservation controls and measures.

The Coast Guard is charged with public safety and law enforcement missions. As such, it is essential that Base Seattle remain operational during system outages or natural disasters. The Federal Sustainability Plan and the DHS Resilience Framework (DHS 2018) dictate that the Coast Guard consider design features to ensure continuity of operations during system outages or natural disasters. Examples of design considerations include seismic hardening of facilities, off-grid power generation and storage (e.g., micro-grid technology), and elevation of critical infrastructure and utility components to reduce any risk of flooding.

Permit Conditions and Environmental Conservation Measures – All construction and site development activities would be completed in compliance with all design standards and with any required permits or approvals issued for site-specific work. The Coast Guard would require, as standard conditions of all Coast Guard construction contracts, that all construction contractors implement Best Management Practices (BMPs) or other control measures before, during, or after construction. These measures, referred to as Environmental Conservation Measures (ECMs), are detailed in Appendix E.

Long-term Operations – Long-term operations at the Base would result in an increase in the number of personnel at the Base, the amount of equipment and delivery vehicle movements, support Table infrastructure, the requirements for storage and use of hazardous materials, and the generation of hazardous wastes. The number of vessels and personnel assigned to Base Seattle is assumed to be the same under all action alternatives and, as such, the tempo of long-term operations is assumed to be the same.

A summary of the key elements of each action alternative is provided in Table 2.5-1 and followed by a detailed description of each action alternative.

Table 2.5-1 Comparison of Alternatives

<table>
<tr><th>Key Elements</th><th>Alternative 1: Modernization with Additional Land and Two Berths at Terminal 46</th><th>Alternative 2: Modernization with Additional Land from Terminals 30 and 46</th><th>Alternative 3: Modernization with Additional Land and One Berth at Terminal 46</th><th>No-Action</th></tr>
<tr><td>Land Acquisition</td><td>Acquire between 27 and 54 acres of land, including and up to 53 acres of Terminal 46 (provides two cutter berths) and the 1.1-acre Belknap property</td><td>Acquire between 21.5 and 29.5 acres of land, including 5.5 acres of Terminal 46, and up to 21.5 acres of Terminal 30 (which includes 1.1-acre Jack Perry Memorial Park), 1.1-acre Belknap property, 1.07-acre MITAGS property, and 0.33-acre of BNSF Railway property</td><td>Acquire between 24.25 and 32.25 acres of land, including up to 29.75 acres of Terminal 46 (provides one cutter berth), 1.1-acre Belknap property, 1.07-acre MITAGS property, and 0.33-acre BNSF Railway property</td><td>No land acquisition; continue leasing 1.1-acre Belknap property and temporary lease of 18acres of Terminal 46</td></tr>
<tr><td>Parking</td><td>Majority of surface parking on Terminal 46 with additional parking on current Base property</td><td>Surface parking on current Base property and on Terminal 30 and Terminal 46</td><td>Surface parking on current Base property and on Terminal 46</td><td>No change to current parking conditions</td></tr>
<tr><td>Mission Support Building</td><td>Construct an approximately 136,000 SF, up to 3-story building along Base’s southern boundary</td><td>Construct an approximately 136,000 SF, up to 3-story building in Base’s southeast portion</td><td>Construct an approximately 136,000 SF, up to 3-story building along Base’s southern boundary</td><td>No construction of Mission Support Building</td></tr>
<tr><td>Base Administration Building</td><td>Construct an approximately 75,000 SF, up to 5-story building south of Pier 36A/B</td><td>Construct an approximately 75,000 SF, up to 5-story building south of Pier 36A/B</td><td>Construct an approximately 75,000 SF, up to 5-story building south of Pier 36A/B</td><td>No construction of building</td></tr>
<tr><td>Base Utilities and Infrastructure</td><td colspan="3">Utility upgrades and extensions required. Utility alignments are estimated to be approximately 3,500 LF.
Systems include communications (e.g., telephone, data, video, comm. relay), electrical, natural gas, sanitary sewer, potable water (includes fire protection water supply), and storm sewer. These improvements include providing shore-side connections to berthed vessels</td><td>No change to existing utilities except routine maintenance (expected to increase due to aging of facilities)</td></tr>
<tr><td rowspan="2">Building 7</td><td colspan="3">Building 7 would either be seismically retrofitted and rehabilitated to meet mission requirements, current code, and seismic standards, or demolished and replaced with new construction</td><td rowspan="2">No change to existing conditions</td></tr>
<tr><td>New replacement buildings would be constructed on Terminal 46</td><td>New replacement buildings would be constructed on Terminal 30</td><td>New replacement buildings would be constructed on Terminal 46</td></tr>
<tr><td>Building 2 and Building 2 Annex</td><td colspan="3">Building 2 and Building 2 Annex would be demolished and their functions would be relocated to new Mission Support Building</td><td>No change to existing conditions</td></tr>
</table>

Key Elements	Alternative 1: Modernization with Additional Land and Two Berths at Terminal 46	Alternative 2: Modernization with Additional Land from Terminals 30 and 46	Alternative 3: Modernization with Additional Land and One Berth at Terminal 46	No-Action
Building 6	Building 6 would be demolished and its functions would be relocated to new Mission Support Building			No change to existing conditions
Building 10	Building 10 would be demolished and its functions would be relocated to renovated Building 7 or new Building 7			No change to existing conditions
Building 12 (Magazine)	Building 12 to be demolished and reconstructed on Terminal 46	Building 12 to be demolished, reconstructed, and reconfigured close to current footprint	Building 12 to be demolished and reconstructed on Terminal 46	No change to existing conditions
Building 14	Building 14 would be demolished and reconstructed adjacent to the north side of Building 7 or adjacent to the new Building 7			No change to existing conditions
Building 1	Building 1 would be demolished and its functions would be relocated to new Base Administration Building			No change to existing conditions
Seismic Stabilization	Installation of approximately 1,000 stone columns—100 feet deep, 3 feet in diameter, 6 feet on center —within current Base boundary and any acquired property			No change to existing conditions
Base Security and Fencing	Replace Main Gate with AT/FP-compliant main ECP; replace secondary gate with AT/FP-compliant ancillary ECP, replace security barriers and pavement, replace overhead security lighting, replace Main Gate Security Gatehouse, and install security sensors			No change to existing conditions
Internal Road Surfaces, Hardscaping, and Landscaping	Replace and reconstruct Base roadways, parking lots, parking aprons, cutter laydown areas, sidewalks, landscaping, and hardscaping			No change to existing conditions
Berthing[1]	Six total major cutter berths required: Four berths provided in Slip 36 and two existing berths would be acquired at Terminal 46	Six total major cutter berths required: Four berths provided in Slip 36, one berth would be developed on Coast Guard property at Pier 35, and one berth would be developed on property acquired at Terminal 30	Six total major cutter berths required: Four berths provided in Slip 36, one existing berth would be acquired at Terminal 46, and one berth would be developed on Coast Guard property at Pier 35	No change to existing conditions
Long-term Operations	A long-term increase in personnel and expanded infrastructure and equipment to accommodate and support an increased number of vessels would result in increases in vessel maintenance functions and increased demand for support services, utilities, and materials and an increased generation of wastes			No change to existing conditions

Note: [1] PEIS assumes some in-water work, including designated pier replacement, would be completed as part of CERCLA removal actions, as described in Section 2.4.
Abbreviations: AT/FP = Anti-Terrorism/Force Protection, ECP = Entry Control Point, SF = square feet, LF = linear feet

2.5.1 Alternative 1: Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Alternative 1 would involve acquisition of land on Terminal 46, including onshore development and access to existing berth space for two Coast Guard cutters. While additional work would occur on the existing Base property, this alternative would provide a single, large piece of property that would enable efficient expansion of Base facilities while providing the capability to incorporate the most effective AT/FP setbacks of all the alternatives. Acquiring two existing, structurally adequate berths would be the most cost-effective and efficient action and would reduce potential effects by eliminating the need to

construct new berths. Alternative 1 would include all components discussed in Section 2.5. Other specific actions are described below. Figure 2.5-2 presents the Alternative 1 conceptual site plan.

Land Acquisition. Under Alternative 1, approximately 27 to 54 acres of land would be acquired, including the following:

- Belknap property from the Port of Seattle – 1.1 acres
- Terminal 46 from the Port of Seattle – between 26 and 53 acres

Under Alternative 1, the PEIS evaluates a range of land acquisition at Terminal 46 from 26 to 53 acres. The Coast Guard's minimum requirement for land at Terminal 46 is 26 acres. If the Coast Guard determines that Building 7 must be demolished, then an additional 8 acres, or a total of 34 acres, would need to be acquired on Terminal 46 to accommodate reconstruction of Building 7. Finally, the PEIS analyzes a maximum acquisition acreage of 53 acres at Terminal 46 because this is the area of Terminal 46 that was previously marketed to the public by the NWSA. NSWA may determine that the 53-acre property is the minimum area that can be effectively or economically removed from Terminal 46.

These acquired properties would provide a larger land area and a more homogenous property boundary for efficient use, development, and improvement of Base facilities. Acquiring the Terminal 46 land would also provide adequate berthing for two cutters and sufficient water depth for mooring PSCs and other major cutters. Land acquired at Terminal 46 would be used for construction of one or more new buildings, dockside access, dockside work, cutter support, equipment laydown, laydown space, and parking. Acquisition would ensure that ingress/egress to the Port-retained portion of Terminal 46, near the northeast corner of Base Seattle, would remain.

Berths. Under this alternative, the four existing Slip 36 berths at Base Seattle would be retained, and 1,070 LF of the total 2,930 LF of existing ship berthing at Terminal 46 would be acquired to accommodate two major cutters.

Parking. Under Alternative 1, surface parking would be distributed across the existing Base as well as a portion of the newly acquired property at Terminal 46. Specifically, most surface parking would be on Terminal 46, which would decongest vehicle movements and parking, enhance pedestrian safety, and facilitate overall operations within the existing Base boundaries. It would also maintain the open unobstructed paved area currently on Terminal 46.

Buildings. As presented in Section 2.5, a number of building construction projects would occur under all alternatives; however, building placement would vary based on land acquisition. The location of proposed new building construction under Alternative 1 would be as follows:

- Construction of new Mission Support Building on the southern boundary of the Base
- Construction of new Base Administration Building to the south of Pier 36A/B
- Construction of new Building 12 on Terminal 46
- Construction of new Building 7 on Terminal 46 if existing Building 7 is demolished

2.5.2 Alternative 2: Modernization with Additional Land from Terminals 30 and 46

Alternative 2 would expand Base Seattle both to the north and south. Under Alternative 2, many of the proposed infrastructure modernization and expansion elements would occur within the current Base boundaries or on land acquired at Terminal 30 and berthing requirements would be satisfied by the development of two new berths to the south (Pier 35 E/F; refer to Section 2.4). Land acquired at Terminal 46 would be used for active cutter support services, material laydown areas, and AT/FP

setbacks. Existing Base Seattle deficiencies would be resolved, AT/FP measures would be implemented, and aging infrastructure would be upgraded to meet current building codes (including seismic). Alternative 2 would include all components presented in Section 2.5. Other specific actions are described below. Figure 2.5-3 presents the Alternative 2 conceptual site plan.

Land Acquisition. Under Alternative 2, approximately 21.5 to 29.5 acres of land would be acquired, including the following:

- Belknap Property from Port of Seattle (currently leased) – 1.1 acres
- MITAGS Property from Port of Seattle – 1.07 acres
- Portion of Terminal 46 from Port of Seattle – 5.5 acres
- Portion of Terminal 30 from Port of Seattle – between 13.5 and 21.5 acres
- BNSF property from BNSF Railway – 0.33 acre

Under Alternative 2, the PEIS evaluates a range of land acquisition at Terminal 30 from 13.5 to 21.5 acres. The Coast Guard's minimum requirement for land at Terminal 30 is 13.5 acres. If the Coast Guard determines that Building 7 must be demolished, then an additional 8 acres, or a total of 21.5 acres, would need to be acquired on Terminal 30 to accommodate reconstruction of Building 7.

Land acquired from Terminal 30 would result in the closure of Jack Perry Memorial Park and its access road and its removal from public use. The park is located on the shoreline and within the area the Coast Guard proposes to develop with waterfront facilities under Alternative 2.

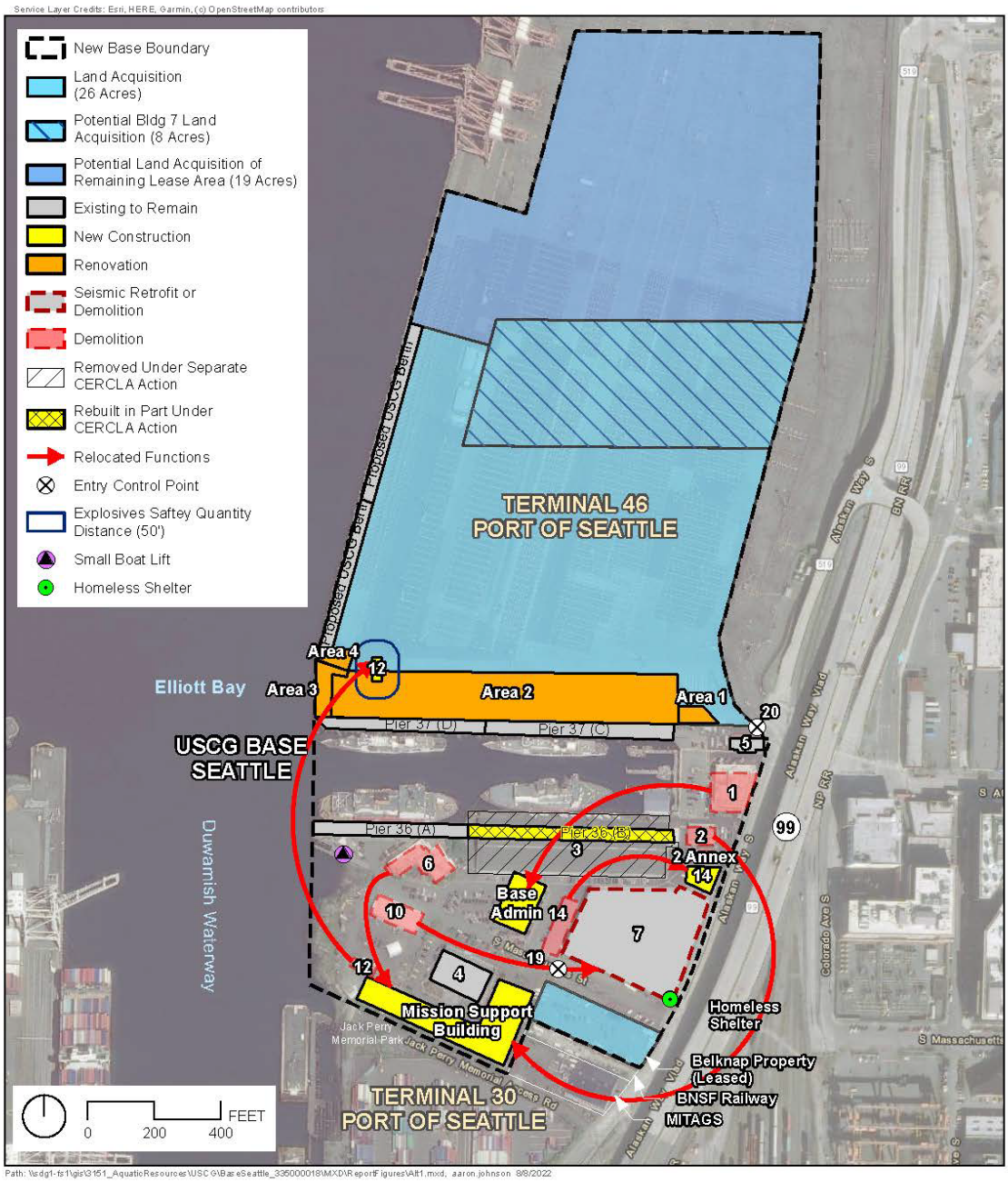
Berths. Under this alternative, the four existing Slip 36 berths would be retained and two berths would be constructed through the Pier 35E/F development (refer to Section 2.4): one berth on Coast Guard property at Pier 35E and one berth on acquired property at Terminal 30 (together totaling 1,120 LF). Work would likely involve typical construction of waterfront facilities, such as pile and decking installation and dredging. The configuration and construction details for both berths are unknown at this time due to the unknown extent of a CERCLA contaminated sediment removal action that would be required prior to any wharf construction.

Parking. Under Alternative 2, surface parking areas would be distributed throughout the current Base boundaries as well as a portion of the newly acquired property at Terminal 30.

Buildings. Proposed building related actions under Alternative 2 include:

- Constructing a new Mission Support Building in the Base's southeast portion,
- Constructing a new Base Administration Building south of Pier 36A/B,
- Constructing a new Building 12 close to its current footprint,
- Construction of a new Building 7 on Terminal 30 if existing Building 7 is demolished

Figure 2.5-2 Alternative 1 Modernization with Additional Land and Two Berths at Terminal 46



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Existing Facilities	3. Industrial Shops and Gym	6. UPH / Galley	12. Magazine
1. Base Admin	4. CG Sector Puget Sound	7. Warehouse	14.Hazmat Pharmacy
2. Exchange	5. Museum	10. ANT-Seattle shops	19. Security Gate / Access Gate

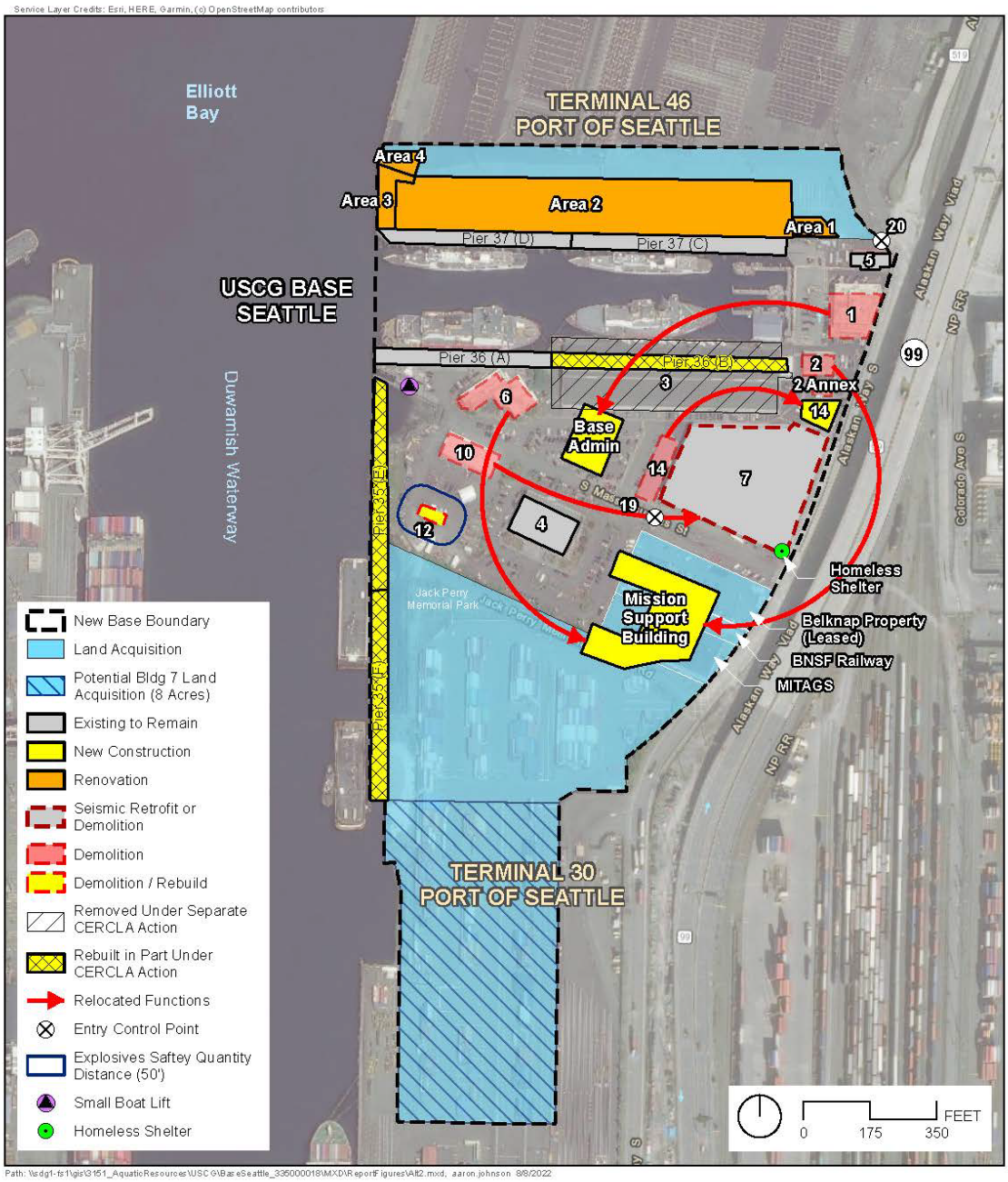
20. Secondary Access Point

Alternative 1: Modernization with Additional Land and Two Berths at Terminal 46

FIGURE 2.5-2

Note: The represented boundary of property proposed for acquisition is notional in shape and exact location and shown for illustrative purposes and analysis.

Figure 2.5-3 Alternative 2 Modernization with Additional Land from Terminals 30 and 46



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Existing Facilities

1. Base Admin
2. Exchange
3. Industrial Shops and Gym
4. CG Sector Puget Sound
5. Museum
6. UPH / Galley
7. Warehouse
10. ANT-Seattle shops
12. Magazine
14. Hazmat Pharmacy
19. Security Gate / Access Gate
20. Secondary Access Point

Alternative 2: Modernization with Additional Land from Terminals 30 and 46

FIGURE 2.5-3

Note: The represented boundary of property proposed for acquisition is notional in shape and exact location and shown for illustrative purposes and analysis.

2.5.3 Alternative 3: Modernization with Additional Land and One Berth at Terminal 46

Under Alternative 3, Base Seattle would expand to the north through land acquisition at Terminal 46 and would infill the current Base footprint by acquiring currently leased properties, as described below. Under Alternative 3, many of the proposed infrastructure modernization and expansion elements would occur within the current Base boundaries and on land acquired at Terminal 46. These elements include satisfying berthing requirements with construction of one new berth within the current Base boundaries (Pier 35E, refer to Section 2.4) and one additional existing berth at Terminal 46. Under Alternative 3, existing Base Seattle deficiencies would be resolved, AT/FP measures upgraded, and aging infrastructure would be upgraded to meet current building codes (including seismic). Alternative 3 would include all components presented in Section 2.5. Other specific actions are described below. Figure 2.5-4 presents the Alternative 3 conceptual site plan.

Land Acquisition. Under Alternative 3, the minimum acquired land would total approximately 24.25 – 32.25 acres, including the following:

- Belknap Property from Port of Seattle (currently leased) – 1.1 acres
- MITAGS Property from Port of Seattle – 1.07 acres
- Terminal 46 from Port of Seattle – between 21.75 and 29.75 acres
- BNSF property from BNSF Railway – 0.33 acre

Under Alternative 3, the PEIS evaluates a range of land acquisition at Terminal 46 from 21.75 to 29.75 acres. The Coast Guard's minimum requirement for land at Terminal 46 is 21.75 acres. If the Coast Guard determines that Building 7 must be demolished, then an additional 8 acres, or a total of 29.75 acres, would need to be acquired on Terminal 46 to accommodate reconstruction of Building 7.

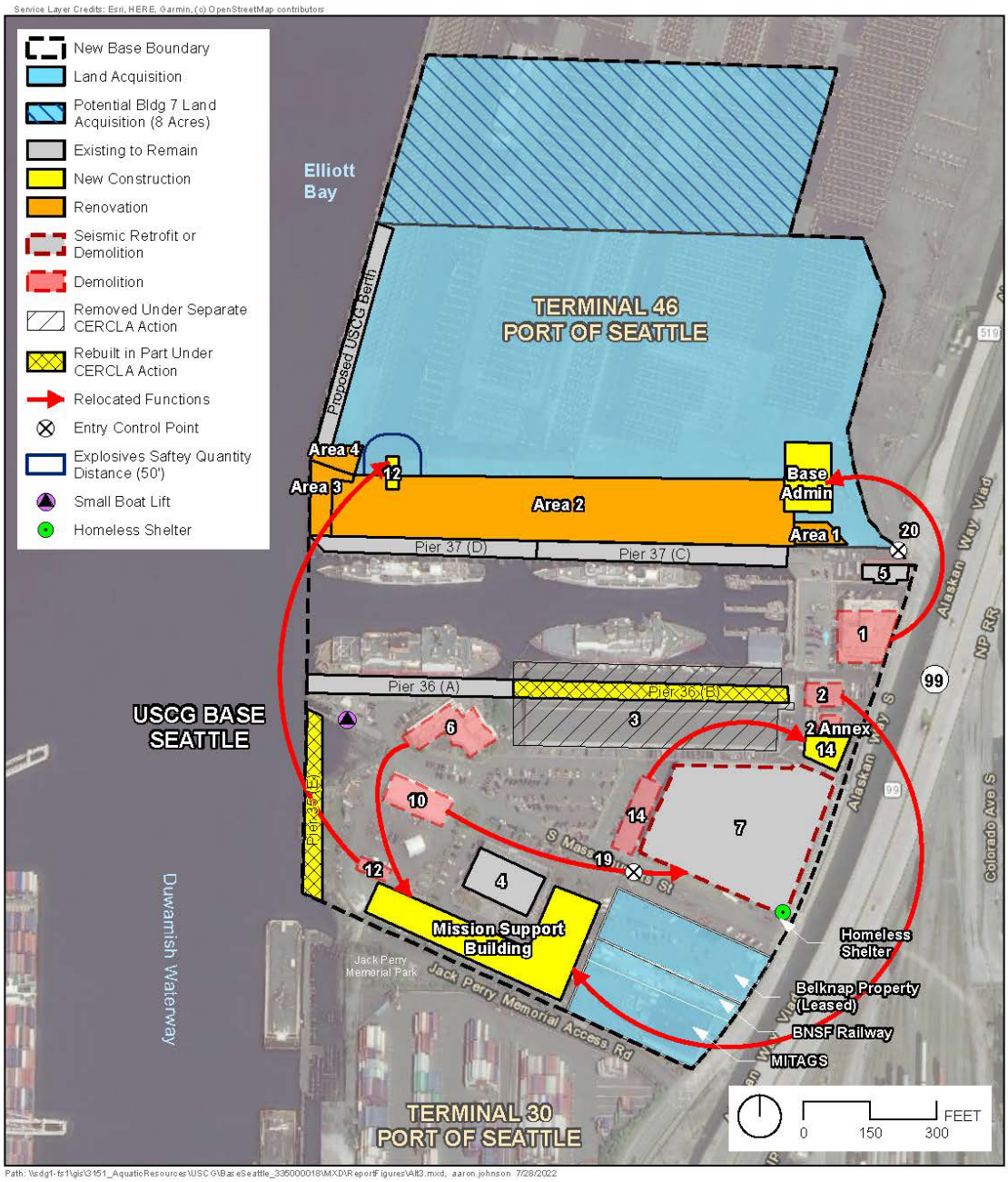
Berths. Under this alternative, the four existing Slip 36 berths would be retained, one existing berth totaling 560 LF would be acquired at Terminal 46, and one new berth would be constructed on Coast Guard property at proposed Pier 35E. Work would likely include typical construction for waterfront facilities, such as pile and decking installation and dredging. The construction configuration and details for this berth are not known at this time due to the unknown extent of a CERCLA contaminated sediment removal action that would be required prior to any wharf construction.

Parking. Under Alternative 3, surface parking would be distributed across the existing Base as well as a portion of newly acquired property at Terminal 46.

Buildings. Proposed building-related actions for Alternative 3 include:

- Construction of a new Mission Support Building on the Base's southern boundary,
- Construction of a new Base Administration Building on the southern portion of Terminal 46 and north of Pier 37,
- Construction of new Building 12 on Terminal 46.
- Construction of facility new Building 7 on Terminal 46 if the existing Building 7 is demolished.

Figure 2.5-4 Alternative 3 Modernization with Additional Land and One Berth at Terminal 46



Existing Facilities

1. Base Admin
2. Exchange
3. Industrial Shops and Gym
4. CG Sector Puget Sound
5. Museum
6. UPH / Galley
7. Warehouse
10. ANT-Seattle shops
12. Magazine
14. Hazmat Pharmacy
19. Security Gate / Access Gate
20. Secondary Access Point

Alternative 3: Modernization with Additional Land and One Berth at Terminal 46

FIGURE 2.5-4

Note: The represented boundary of property proposed for acquisition is notional in shape and exact location and shown for illustrative purposes and analysis.

2.5.4 No-Action Alternative

Under the No-Action Alternative, the Coast Guard would not implement land acquisition, facility modernization, construction of new buildings, or infrastructure enhancements. Base Seattle would not be upgraded to make it a suitable location to homeport up to eight future major cutters. However, the decision to homeport three PSCs has been made and they would be expected to arrive after the ships are manufactured. Base Seattle would have the capacity to berth a maximum of four major cutters. The Coast Guard would continue to lease the 1.1-acre Belknap property and the recently leased 18 acres of property on Terminal 46, including 1,100 LF of temporary ship berthing space. The recently executed lease between the Port and the Coast Guard for use of land on Terminal 46 terminates in September 2025. The CERCLA cleanup work in Slip 36 would proceed and Building 3 would be demolished as part of that cleanup action.

The No-Action Alternative would also eliminate the possibility of Coast Guard personnel relocating to Base Seattle from current facilities in downtown Seattle. Further, several buildings on Base could be forced to reduce capacity or risk losing functionality altogether if ongoing structural deterioration is not addressed. Delaying necessary demolition and construction projects would result in increased risks to the environment, the public, and the health and safety of Coast Guard personnel and visitors.

Selecting the No-Action Alternative would significantly impair the Coast Guard's ability to accomplish its operational mission requirements adequately and effectively throughout the Pacific Northwest and Arctic operational areas. The Coast Guard's ability to execute its many statutory missions effectively and efficiently may be impaired. This alternative is carried forward for analysis in the PEIS to comply with the CEQ NEPA regulations (40 CFR §1502.14[c]) and to provide a comparative baseline against which to evaluate impacts of the Proposed Action and alternatives.

2.6 Alternatives Considered but not Carried Forward

During the strategic planning process, the Coast Guard developed screening criteria to define possible development concepts for planning consideration. These screening criteria also provide a basis for developing and/or validating the range of viable alternatives to evaluate in the PEIS. Based on the screening criteria developed during the strategic planning process, and described above, a range of configurations for both shore-side and waterside infrastructure were developed. The Coast Guard eliminated alternatives that did not meet the screening criteria or fulfill the purpose and need for the Proposed Action from consideration in the PEIS. Alternatives involving relocating operations away from Base Seattle did not meet the screening criteria or purpose and need and were not considered further. Two additional alternatives, described below, were initially identified during the strategic planning process, but these alternatives did not meet the purpose and need and were eliminated from further consideration in this PEIS.

2.6.1 Remodeling and Refitting Existing Buildings Alternative

Under this alternative, the Coast Guard would retain Buildings 1, 2, 2 Annex, and 6. No new facilities (e.g., Mission Support Building, Base Administration Building) would be constructed. The Coast Guard would not acquire any additional land. Base Seattle operations and medical/dental clinics would be relocated to a renovated Building 7, which currently has adequate space to absorb these functions. Building 6 would be renovated for compliance with current code requirements and expanded to accommodate increased Unaccompanied Personnel Housing (UPH) and galley requirements. Building 1 would be renovated and rehabilitated for compliance with current code requirements and to allow for functions to remain.

Under this alternative, a maximum of five berths would be available. As a result, there would not be adequate berthing space to fulfill the purpose and need. Further, with limited land space for redevelopment, identified land use inconsistencies and operational inefficiencies would not be remedied. Additionally, the AT/FP requirements could not be met due to the limited amount of land available for development and growth. This alternative has been identified as non-viable because it does not meet the screening criteria to support the purpose and need for the Proposed Action, including providing adequate berthing to support Coast Guard missions, resolving land use incompatibilities, and maximizing operational efficiencies.

2.6.2 No Land Acquisition Alternative

Under this alternative, the Coast Guard would not acquire any additional land. A new Mission Support Building and a new Base Administration Building would be constructed within the current Base boundaries and Building 7 would be renovated. This alternative would result in a parking shortfall that could only be addressed by constructing a parking garage. Under this alternative, a maximum of five berths would be available. As a result, there would not be adequate berthing space to fulfill the purpose and need. Further, with limited land space for redevelopment, identified land use inconsistencies and operational inefficiencies would not be remedied. Additionally, the AT/FP requirements could not be met due to the limited amount of land available for development and growth. This alternative has been identified as non-viable because it does not meet the screening criteria to support the purpose and need for the Proposed Action, which include providing adequate berthing to support Coast Guard missions, resolving land use incompatibilities, and maximizing operational efficiencies.

3 Affected Environment and Environmental Consequences

This chapter describes the existing conditions in and around Base Seattle (affected environment) and provides a summary of the potential impacts on affected environmental resources (environmental consequences) that could occur as a result of the implementation of any of the three action alternatives or the No-Action Alternative. This PEIS focuses on the relevant potential environmental impacts that could occur if the Proposed Action were implemented. The PEIS considers impacts on the following resource areas:

- Land Use
- Geological Resources
- Water Resources
- Transportation
- Air Quality
- Biological Resources
- Socioeconomics and Environmental Justice
- Cultural Resources
- Noise
- Utilities and Public Services
- Hazardous Materials and Wastes
- Visual Resources
- Recreational Resources
- Greenhouse Gases and Climate Change

The *Affected Environment* subsections in this Chapter describe the resource-specific baseline conditions at Base Seattle and the surrounding area, including properties that the Coast Guard proposes to acquire under one or more alternatives, such as Port of Seattle Terminals 46 and 30, Jack Perry Memorial Park, other smaller parcels including smaller Port properties (herein referred to as MITAGS and Belknap properties), and the BNSF Railway property. A region of influence (ROI) is defined for each specific resource area based on the resource's characteristics and any relevant regulations. For most resource areas, the ROI consists of Base Seattle and the immediate vicinity; however, in some cases the ROI extends beyond the immediate project vicinity due to the nature of the resource (e.g., the ROI for air quality is the entire Salish Sea airshed). Applicable and relevant federal, state, and local laws, regulations, and guidance are considered within the analysis (see Appendix F for descriptions).

The *Environmental Consequences* subsections provide resource-specific analyses of direct and indirect environmental impacts (both beneficial and adverse) that could potentially result from implementation of the project alternatives and any connected actions. In some instances, an action's environmental impacts on one resource may result in an impact to another resource. For example, increased stormwater runoff resulting from a proposed action—a direct impact considered under Section 3.3, *Water Resources*—may flow into aquatic habitat and thereby affect species or their habitat, resulting in an indirect impact that would be considered under Section 3.6, *Biological Resources*. This PEIS also considers any irreversible and irretrievable resource commitments that may occur should the project be implemented.

Table 3-1 presents the primary project components of the Proposed Action - land acquisition, construction, and long-term operations. Specific types of activities and impact causing mechanisms within each of the primary components, and the resource areas that may be impacted, are identified in the table. For example, construction would require the use of heavy machinery, which could potentially cause an impact to some but not all resource areas. Further, these components and subcomponents are not isolated actions but are activities that may occur concurrently. Construction worker commutes for example could occur at the same time as new personnel commutes. As such, the environmental analysis considers multiple subcomponents occurring at the same time and the combined potential for impacts.

In this analysis, significance is determined on a resource-by-resource basis. The Coast Guard determines significance by considering the degree and magnitude of the effects under the alternatives implemented. Per the CEQ NEPA regulations at 40 CFR §1501.3[b], the Coast Guard has considered the degree of effects to each resource area:

- Both short- and long-term effects,
- Both beneficial and adverse effects,
- Effects on public health and safety,
- Effects that would violate applicable federal, state, tribal, or local law protecting the environment.

Environmental Conservation Measures (ECMs), planning and design measures, and special procedures that would be included under any of the action alternatives to avoid and/or minimize potential environmental impacts are presented in Appendix E. These measures are organized according to the phase of project development and execution when they would be implemented (i.e., contract pre-award, planning, design, construction, and post-construction), and identify the appropriate party for implementation. Measures identified under each environmental resource area would serve to avoid or minimize any adverse temporary or long-term construction or operational impacts.

Table 3.0-1 Program Impact Mapping Matrix

Major Program Components and Associated Impact-causing Elements[1]	Section 3.1, Land Use	Section 3.2, Geological Resources	Section 3.3, Water Resources	Section 3.4, Transportation	Section 3.5, Air Quality	Section 3.6, Biological Resources	Section 3.7, Socioeconomics and Environmental Justice	Section 3.8, Cultural Resources	Section 3.9, Noise	Section 3.10, Utilities and Public Services	Section 3.11, Hazardous Materials and Wastes	Section 3.12, Visual Resources	Section 3.13, Recreational Resources	Section 3.14, Greenhouse Gases and Climate Change
Land Acquisition														
Displacement of Current Functions														
Alternative 1: T46 (from 26 acres up to 53 acres) and Belknap property	●			●	●		●		●	●	●			●
Alternative 2: T46 (5.5 acres), T30 (13.5 to 21.5 acres including Jack Perry Memorial Park), Belknap, MITAGS, and BNSF Railway property	●			●	●		●		●	●	●		●	●
Alternative 3: T46 (from 21.75 to 29.75 acres), Belknap, MITAGS, and BNSF Railway property	●			●	●		●		●	●	●			●
Construction, Demolition, Rehabilitation, and Renovation														
Staging and Construction Support														
Rerouting of Traffic				●	●				●	●			●	●
Transport of Construction Equipment and Materials to and from the Site				●	●								●	●
Generation, Use, and Storage of Hazardous Materials / Wastes		●	●		●						●			●
Equipment and Construction Material Storage	●	●	●								●			
Maintenance / Refueling of Heavy Equipment		●	●								●			
Installation of Construction Fencing	●													
Worker and Material Acquisition and Transportation				●	●		●		●					●

Major Program Components and Associated Impact-causing Elements[1]	Section 3.1, Land Use	Section 3.2, Geological Resources	Section 3.3, Water Resources	Section 3.4, Transportation	Section 3.5, Air Quality	Section 3.6, Biological Resources	Section 3.7, Socioeconomics and Environmental Justice	Section 3.8, Cultural Resources	Section 3.9, Noise	Section 3.10, Utilities and Public Services	Section 3.11, Hazardous Materials and Wastes	Section 3.12, Visual Resources	Section 3.13, Recreational Resources	Section 3.14, Greenhouse Gases and Climate Change
Demolition / Grading														
Use of Heavy Equipment for Demolition and Removal of Utilities, Buildings, Pavement, Piles, Decking, etc.	●	●	●	●	●	●		●	●	●	●			●
Disposal of Hazardous Building Materials / Contaminated Soils		●	●	●	●	●			●		●			●
Ground Disturbance (Excavation and Grading)		●	●		●	●		●	●	●	●			●
Relocation of Current Uses / Functions	●								●					
Construction														
Use of Power Tools / Heavy Equipment / Auger / Pile Driving for Infrastructure Establishment		●	●		●	●			●	●	●			●
Ground Disturbance		●	●		●	●		●	●	●	●			●
Establishment of New Facilities	●				●					●	●	●		●
Long-term Operation of Expanded Base														
Increased Vehicular Transits (commutes, deliveries, operations)				●	●				●					●
Expanded Base Fencing / Security / Lighting	●					●				●		●		
Reconfigured Buildings and Support Infrastructure (e.g., generators, stormwater systems)	●	●	●		●	●	●		●	●		●		●
Landside and Waterfront Security Buffer	●			●			●	●					●	

Major Program Components and Associated Impact-causing Elements[1]	Section 3.1, Land Use	Section 3.2, Geological Resources	Section 3.3, Water Resources	Section 3.4, Transportation	Section 3.5, Air Quality	Section 3.6, Biological Resources	Section 3.7, Socioeconomics and Environmental Justice	Section 3.8, Cultural Resources	Section 3.9, Noise	Section 3.10, Utilities and Public Services	Section 3.11, Hazardous Materials and Wastes	Section 3.12, Visual Resources	Section 3.13, Recreational Resources	Section 3.14, Greenhouse Gases and Climate Change
Increased Storage / Use of Hazardous Materials and Generation of Hazardous Waste											●			
Increased Personnel / Parking / Personal Vehicle Trips				●	●		●		●					●

Note: Dots indicate that a specific impact-causing element may affect a specific resource area

3.1 Land Use and Coastal Zone Management

Summary of Findings

Implementation of the Proposed Action and Action Alternatives would result inconsistency with established land use plans and policies, resulting in long-term, significant impacts. No indirect spillover land use impacts in surrounding communities would be expected.

With regard to Coastal Zone Management, no direct conflicts with enforceable policies of federal or State coastal management plans have been identified, and no significant impacts would result.

3.1.1 Background

Land Use

Land use comprises natural or human-modified conditions and includes both existing uses and designated land use classifications in accordance with management plans and zoning regulations. Land use classifications determine the type and extent of land use allowable and are often intended to separate incompatible uses or protect sensitive areas.

Land use also refers to how people actively use the land. For example, in a residentially zoned area, there may be coastal access, parks, schools, and recreational uses. Land use conflicts can arise when a neighboring land use is incompatible with a proposed use of the property. An example of a land use conflict would be when a piece of property is used for multi-family homes, but a coal-fired power plant is built on an adjacent parcel. A land use conflict (or a change in land use) could be adverse if a project compromised or eliminated the ability of a parcel or area to be used for its current or planned purpose. Implementation of a project could have adverse impacts if it measurably changed land usage, land cover, or zoning, or if it triggers a physical or administrative change in zoning or planning policies.

Coastal Zone Management

Coastal zone management addresses development in coastal areas by balancing protection of coastal access, resources, and ecosystems with programmed best uses and economic growth. Goals of coastal zone management are to preserve, protect, develop, enhance, and restore (where possible) coastal resources.

The federal Coastal Zone Management Act (CZMA) creates a federal-state partnership to ensure coastal resources are protected. The CZMA requires federally funded actions that have the potential to affect coastal zone resources to be carried out in a manner consistent with the applicable state Coastal Management Program policies. The Washington State Department of Ecology (Department of Ecology) administers the Washington Coastal Zone Management Program (WCZMP), which implements a combination of federal, state, and local regulatory requirements for controlling land use in the State's defined Coastal Zone. Base Seattle is federal property and therefore it is not within the State's Coastal Zone from a regulatory perspective; however, consistency with the WCZMP must be evaluated if effects could occur within the adjacent coastal zone.

The WCZMP's enforceable policies are contained within five laws, regulations, and plans: 1) Shoreline Management Act (SMA; RCW 90.58 and Washington Administrative Codes [WACs] 173-15 through 26); 2) Water Pollution Control Act (WPCA; RCW 90.48 and WACs 173-40 through 270 and 372-52 through 68); 3) Washington Clean Air Act (WCAA; RCW 70.94 and WACs 173-400 through 495); 4) Ocean

Resources Management Act (RCW 43.143); and 5) Marine Spatial Plan for Washington's Pacific Coast. With respect to the determining consistency of the action alternatives considered in this PEIS, only the SMA, WPCA, and WCAA are applicable (Department of Ecology 2020; refer to Appendix G).

3.1.2 Approach to Analysis

This analysis considers the consistency of the Proposed Action, its alternatives, and the No-Action Alternative with current and planned development and land use patterns. It considers the impacts on how people can use the area to determine if the Coast Guard's action would potentially: 1) cause noticeable changes in land use or create conflicts between adjacent land uses; 2) result in incompatibilities with land use plans; or 3) conflict with enforceable policies of the Coastal Management Program.

Land use activities within the boundary of Base Seattle are managed by the Coast Guard. Surrounding land uses in the greater Seattle area are managed by multiple agencies that guide development in the region by providing goals, objectives, and guidance through planning processes and programs at multiple levels, such as the Puget Sound Regional Council's VISION 2050 and King County Comprehensive Plan. The City of Seattle 2035 Comprehensive Plan guides land use immediately around Base Seattle. Because Base Seattle's proposed expansion and modernization is a local program, the Coast Guard considered – and incorporates by reference herein – the following plans and programs to evaluate consistency of the Proposed Action with current and future land use patterns in the vicinity of Base Seattle:

- City of Seattle 2035 Comprehensive Plan (including its Container Port Element) (City of Seattle 2016)
- City of Seattle Shoreline Master Program (SMP), which comprises the Shoreline Goals and Policies in the City of Seattle Comprehensive Plan (2016)
- Washington CZM Program (administered by the Department of Ecology)

The Coast Guard relies on these plans to compare changes in land use activities that would result from the proposed Base Seattle expansion and modernization program to identify potential conflicts with current or planned land uses and land use policies.

3.1.3 Affected Environment

Local Setting

The Seattle 2035 Comprehensive Plan establishes policies to guide land use and growth in the City of Seattle (City of Seattle 2016). The City is in the process of updating its industrial and maritime policies and zoning (City of Seattle 2021b). In accordance with the Comprehensive Plan, commercial and recreational land uses are clustered in the City's downtown and its waterfront, while manufacturing and industrial uses tend to extend south from downtown toward the Port of Seattle (Figure 3.1-1). The Comprehensive Plan designates the area around Base Seattle as the Greater Duwamish Manufacturing / Industrial Center, and establishes goals and policies for this area that focus largely on maintaining industrial land uses to promote and preserve jobs and economic vitality (see Section 3.7, *Socioeconomics*, regarding potential impacts to jobs from the Proposed Action). Major goals and policies applicable to land use and the Coast Guard's proposed land acquisition include:

- GD-G3 Land in the Duwamish Manufacturing / Industrial Center is maintained for industrial uses including the manufacture, assembly, storage, repair, distribution, research about or

development of tangible materials and advanced technologies, as well as transportation, utilities, and commercial fishing activities.

- GD-G7 The City and other government bodies recognize the limited industrial land resource and the high demand for that resource by private industrial businesses within the Duwamish Manufacturing / Industrial Center when considering the siting of public uses there.
- GD-P17 Encourage other jurisdictions to: […] 2. consolidate public facilities to minimize the amount of land consumed by the public sector.

The Container Port Element of the City's Comprehensive Plan contains specific land use policies applicable to the Port properties proposed for acquisition by the Coast Guard. The relevant policies of this element for the Coast Guard action are as follows:

- Policy CP1. Help preserve cargo container activities by retaining industrial designations on and that supports marine and rail-related industries including industrial land adjacent to rail or water-dependent transportation facilities.
- Policy CP2. Continue to monitor the land area needs, including for expansion, or cargo container-related activities and take action to prevent the loss of needed land that can serve these activities.
- Policy CP3. Discourage non-industrial land uses, such as rail and residential, in industrially zoned areas to minimize conflicts between uses and to prevent conversion of industrial land in the vicinity of cargo container terminals or their support facilities.
- Policy CP4. Consider how zoning designations may affect the designation of highest and best use, with the goal of maintaining the jobs and revenue that cargo container activities generate and to protect scarce industrial land supply for cargo container industries, such as marine and rail-related industries.

The City's SMP within the Comprehensive Plan establishes goals and policies for coastal lands within the City. The SMP's purpose is to implement policies and provisions of the State's Shoreline Management Act and relevant goals and policies of the City's Comprehensive Plan. The SMP's primary objectives are to protect and enhance public health, safety, and welfare by regulating development, uses, and modification of the City's shorelines. Regarding land use policies, the SMP encourages water-dependent uses, provides for maximum public access to City shorelines, and encourages land use that preserves, enhances, or increases public views of the water.

The City of Seattle's Zoning Code governs the specific use and development of land within the City. The area around Base Seattle is zoned by the City as General Industrial (IG-1), which is defined as "An area that provides opportunities for manufacturing and industrial uses and related activity, where these activities are already established and viable, and their accessibility by rail and/or waterway make them a specialized and limited land resource."

The City's Comprehensive Plan and zoning code designations apply to the Port of Seattle and other neighboring properties within the City but do not apply to federal property, including Base Seattle, and would no longer apply to any land acquired by the Coast Guard under the Proposed Action. While these designations do not apply to Coast Guard property, the Coast Guard nevertheless considers local land use and strives to maintain consistency to the maximum extent practicable with local land use policies. The goals and policies of the SMP are considered within the context of the CZMA evaluation.

Within Base Seattle, land use is planned and managed through Coast Guard planning processes and documents. Due to the nature of the surrounding area and the type of operations at Base Seattle, land

use activities within the Base do not directly influence or impact surrounding land use conditions. Changes to internal land use development patterns and activities (e.g., to address exiting AT/FP shortfalls) are directly related to the purpose and need of the Proposed Action (refer to Section 1.3).

Surrounding land uses include the following. To the north and east of Base Seattle are Pioneer Square (approximately 1.4 miles from the base) and the Chinatown-International District (approximately 1.7 miles from the base). Both of these areas are elements of the Downtown District and zoned for commercial and residential uses. Land use surrounding the Base is characterized by commercial and industrial facilities, including manufacturing and the Port of Seattle. Two major Port of Seattle waterfront industrial properties are adjacent to Base Seattle: Terminal 30 to the south and Terminal 46 to the north (Port facilities are described further below.) T-Mobile Park (home to the Seattle Mariners with a seating capacity of 48,000) and Lumen Field (home to the Seattle Seahawks with a capacity of 72,000) are located approximately 0.3 mile east and 0.6 mile northeast of the Base, respectively. Both sports stadiums occupy multiple city blocks and are used for games and special events.

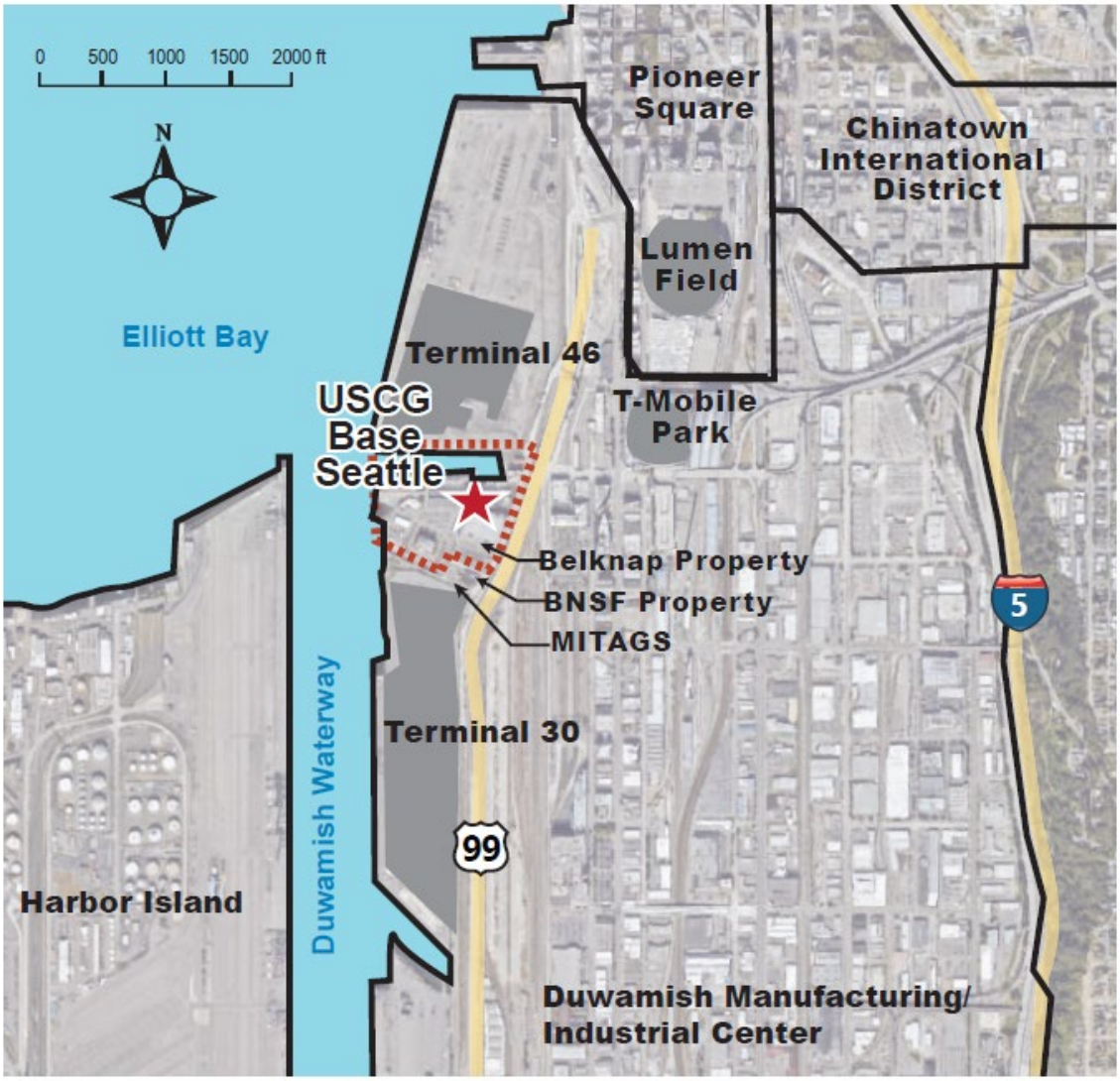
Port of Seattle

The Port of Seattle encompasses approximately 1,542 acres of waterfront and nearby property that supports container and general-purpose cargo terminals, a foreign trade zone, and cargo storage, including 500 acres of terminal facilities. The movement of large ships, including cargo and cruise ships throughout the Puget Sound and Elliott Bay, are a daily aspect of marine traffic at the Port (Port of Seattle 2019c).

The Port of Seattle includes four container terminals - Terminal 5, Terminal 18, Terminal 30, and Terminal 115 - and one non-container terminal- Terminal 46 (The Northwest Seaport Alliance 2020). Information on each terminal is provided in Table 3.1-1. Terminal 5 is currently undergoing a major update to modernize and increase cargo handling capacity from 647,000 twenty-foot equivalent units (TEUs) to 1.3 million TEUs by 2030 (Port of Seattle 2016). Terminal 46 is classified as an alternative maritime use cargo terminal but is currently being used for container storage and other short-term functions (e.g., parking and storage during ongoing CERCLA efforts at Slip 36). Most of the surface area of each terminal is paved and is either in use, vacant, or used as flexible use space. Some support functions, such a vehicle parking, temporary offices or trailers, and related uses also occur. Permanent pavement enables relocation of existing uses or transfer of tenants. Jack Block Park, which provides public shoreline access, is located adjacent to the northwestern portion of Terminal 5. Terminal 18 Park is a 1.1-acre public access park with 310 linear feet of shoreline along the Duwamish Waterway. Terminal 115 provides public access to 180 linear feet of shoreline through park and pathway space.

The action alternatives include proposed acquisition of land from the Port of Seattle, including Terminal 46, Terminal 30, MITAGS property, Belknap property, Jack Perry Memorial Park, and the BNSF Railway property. Additional detail on these properties is provided below.

Figure 3.1-1 Existing Surrounding Land Use and Neighborhoods



Source: City of Seattle 2020

Existing Surrounding Land Use and Neighborhoods

FIGURE 3.1-1

Table 3.1-1 Container Terminals at Port of Seattle

Container Terminal	Berthing space (linear feet)	Individual Terminal Area (acres)	% of Total Port of Seattle Acreage[1]	% of Total Container Terminal Acreage
Terminal 5	2,900	185	12	28.7
Terminal 18	4,440	196	13	30.4
Terminal 30	2,685	82	5	12.7
Terminal 46	2,930	86	6	13.3
Terminal 115	1,660	96	6	14.9

1 The sum of percent of this column does not total 100% because this column represents the Percent acreage of the acreage of individual container terminals compared to total Port acreage.

Terminal 46. Terminal 46 is located immediately north of Base Seattle and has been in its current configuration since 1980. This terminal, located within the Greater Duwamish MIC, serves as a marine transportation facility, and supports cargo and other marine operations. Terminal 46 has a capacity of up to 600,000 TEUs (i.e., the size of a standard intermodal container commonly used on ships and at ports) per year. Terminal 46 encompasses approximately 86 acres (5.6 percent of the acreage at the Port) and is accessed by nine inbound access gates and eight outbound gates. Terminal 46 has approximately 2,930 linear feet of berthing with a depth of -50 feet MLLW (NWSA n.d.). The Port of Seattle had previously proposed a new cruise terminal at the northern end of Terminal 46 but put the plans for that Terminal on hold in July 2020 (Port of Seattle 2020b). Instead, in July 2021, the NWSA voted to allow a portion of Terminal 46 to be utilized as a regional training center for the longshoremen. In July 2022, the Port approved a short-term lease (39 months) of a portion of Terminal 46 to the Coast Guard, including 1,100 linear feet of berthing space. The Coast Guard intends to use this part of Terminal 46 for mooring vessels anticipated to be displaced by the CERCLA removal action in Slip 36, and for temporary relocation of some functions displaced from Building 3, which is expected to be demolished as part of the CERCLA removal action. No permanent modifications would occur in this short-term lease area as part of the Coast Guard's use of the property.

Terminal 30. Terminal 30 is an approximately 82-acre container terminal (5.3 percent of Port acreage) immediately south of Base Seattle. The Port purchased the property from Chevron in 1985 and developed it in 1986. A two-berth cruise ship facility was established on a portion of Terminal 30 from 2003 to 2008 following a decrease in cargo volumes. As international cargo activities subsequently increased, the southern portion of the terminal was repurposed and resumed cargo operations in 2008. Terminal 30—currently operated by SSA Terminals—provides two berths (totaling approximately 2,700 linear feet and with water depths of -50 feet MLLW), three cranes, one deep-water berth for cargo vessels, and an adjacent berth for barge activities. The primary truck gate, located within the Alaskan Way right-of-way (ROW) north of Terminal 30, provides eight lanes, three of which are reversible. The Port maintains a use agreement with the Seattle Department of Transportation (SDOT) for this area (Port of Seattle 2021).

MITAGS and Belknap Properties The MITAGS facility is on a 1.07-acre property leased from the Port of Seattle that is immediately west of Alaskan Way South and adjacent to Base Seattle and Jack Perry Memorial Park. MITAGS is a maritime training school that offers various maritime as certification and training programs, including training programs for Coast Guard personnel.

The Belknap property, located adjacent to Base Seattle's main gate, is owned by the Port of Seattle, and is currently leased from the Port by the Coast Guard. This property, measuring approximately 1.1 acres, is previously disturbed, paved, and used primarily for equipment storage and government vehicle parking.

BNSF Railway Property

The BNSF Railway property, located off Alaskan Way and between the Belknap and MITAGS properties. This property was previously a railroad spur but is currently undeveloped and covered in gravel.

Jack Perry Memorial Park

Jack Perry Memorial Park is a 1.1-acre coastal waterfront park between Pier 34 and Base Seattle. The Park provides approximately 120 feet of public shoreline access (Year of Seattle 2020). Jack Perry Memorial Park is largely paved with few amenities. It has water access but does not provide a boat ramp. No data summarizing visitation or use of Jack Perry Memorial Park was readily available (refer to Section 3.13, *Recreational Resources*, for additional details about the park).

The Park was developed by the Port to provide for public coastal access, which is limited in the Duwamish District MIC, following the previous expansion of Terminal 30. To provide context, according to King County Natural Resources and Parks, there are 32 miles of coastal trails and 45 parcels providing public coastal access in the County (King County 2019). The nearest other coastal access park is Jack Block Park, located approximately 4 miles to the west.

Portside Trail

WSDOT opened the Portside Trail (also referred to as the Alaskan Way Trail) for public use in July 2011. The trail is a striped pedestrian and bicycle path accessible at South Atlantic Street (northbound) and South King Street (southbound). It includes permanent barriers separating users (e.g., cyclists, pedestrians) from vehicles. A segment of the trail runs parallel to the perimeter fence around Terminal 46. Refer to Section 3.12, *Visual Resources*, and Section 3.13, *Recreational Resources*, for additional details about the trail.

Base Seattle

Base Seattle currently encompasses approximately 24 acres; 18 acres of upland and 6 acres of submerged lands. Coast Guard exercises Navigational Servitude over approximately 1 acre of State-owned, submerged lands adjacent to Pier.[1]

The Base provides the full spectrum of logistics necessary to support Coast Guard mission execution, including administrative and personnel support, health, safety and work life, facilities and naval engineering, contracting, and communications and information technology. Base Seattle out-grants

[1] Navigational Servitude is a doctrine within the U.S. Constitution that allows the federal government to regulate alignment, access to, and use of navigable waterways due to their importance to commerce.

space to several non-Coast Guard entities such as Pacific Northwest (PNW)-Coast Guard Museum, Sea Cadets, Washington State Police, CBP, and the U.S. Army Corps of Engineers (USACE) (USACE permits use of the space it leases at the Base to the St. Martin de Porres Homeless Shelter). Base land use activities, planned and implemented through established Coast Guard processes, are focused on maritime operations and all land use activities at the Base ultimately support those operations.

3.1.4 Environmental Consequences of the Action Alternatives

Impacts on land use and coastal zone resources common to all three action alternatives are described herein. Related or indirect impacts such as to recreation or socioeconomic resources are detailed in other resource areas in the PEIS. Land acquisition by the Coast Guard could result in displacement of existing Port, City of Seattle, or commercial land uses. Relocation of these uses would not be within the Coast Guard's authority to implement; however, this document identifies displaced uses and, where possible, analyzes whether those functions could be absorbed elsewhere. The Coast Guard however can neither prescribe nor require the relocation of these functions, and cannot mitigate by relocating, or paying to relocate, the functions, and such relocations would be at the discretion of the current property owner. The analysis also acknowledges potential future impacts to land use due to the dynamic nature of Port operations that could affect the future use of the terminals in the Port of Seattle.

Sections 3.1.4.1 through 3.1.4.3 describe impacts that are unique to each action alternative, and Section 3.1.6 presents several tables providing a comparison of land use and coastal zone impacts across all action alternatives. Consistency with the WCZMP is addressed for each action alternative considered. A full Coastal Consistency Determination pursuant to the CZMA has been prepared for Alternative 1 (the Preferred Alternative) and is provided in Appendix G.

Because land use is inter-related to other resource areas, impacts to uses of land are included within this section. More detailed information regarding socioeconomic impacts (e.g., associated with displacement of the homeless shelter) is provided in Section 3.7, and traffic impacts are evaluated in Section 3.4.

Land Acquisition

Property acquisition under any action alternative would result in a direct impact to land uses and land use patterns on the acquired properties because these current uses would be displaced. Planned Coast Guard use of any acquired property under the action alternatives would be compatible with surrounding land uses (i.e., waterfront and industrial). Changes in property ownership would result in displacement of current activities and elimination of potential for future use by the Port or other property owner, including upland and waterside development, cargo movement/storage, shoreside berthing, or recreational use. Land use beyond the Base and any acquired property would not be directly or indirectly impacted by termination of current activities since this diminishment of current activities would have no impact on the character or functions of the surrounding land uses, including Pioneer Square, Chinatown, and the sports stadiums.

Acquisition of land by the Coast Guard under any of the action alternatives would be inconsistent or somewhat inconsistent with specific policies of the City's Comprehensive Plan, as described below:

- Policy GD-G3: Acquisition of land by the Coast Guard would be inconsistent with this policy objective since it would remove land in the Duwamish Manufacturing / Industrial Center from commercial industrial uses, such as manufacture, assembly, storage, repair, distribution, research about or development of tangible materials and advanced technologies, as well as transportation, utilities, and commercial fishing activities.

- Policy GD-G7: Acquisition of land by the Coast Guard would be somewhat inconsistent with this policy becuase, while it would reduce land available for industrial uses, the Coast Guard does recognize the limited industrial land resource, and is seeking to minimize the amount of land it would acquire to meet its needs.

Acquisition of land by the Coast Guard under any of the action alternatives would be inconsistent with specific policies of the Port Container Element of City's Comprehensive Plan, as described below:

- Policy CP1: Preserve cargo container activities by retaining industrial designations on and that supports marine and rail-related industries – Implementation of any of the action alternatives would be inconsistent with Policy CP1 since federal lands are not subject to local land use controls and, as such, the acquisition would effectively remove the acquired land from local land use management for the purpose of retaining marine industries.
- Policy CP2: Continue to monitor the land area needs, including for expansion, or cargo container-related activities and take action to prevent the loss of needed land that can serve these activities – Implementation of any of the action alternatives would be inconsistent with Policy CP2 because Coast Guard acquisition would directly remove lands from cargo and container operations.
- Policy CP3 – Discourage non-industrial land uses to minimize conflicts between uses and to prevent conversion of industrial land in the vicinity of cargo container terminals or their support facilities – All action alternatives would be consistent with this policy because action alternatives would be consistent with neighboring industrial land uses and would not encourage or facilitate development of non-industrial (e.g., retail, residential) land use.
- Policy CP4 – Consider how zoning designations may affect the designation of highest and best use, with the goal of maintaining the jobs and revenue that cargo container activities generate and to protect scarce industrial land supply for cargo container industries – All action alternatives would be inconsistent with this policy because they would all remove acquired lands from zoning controls and, while implementation of all action alternatives would result in job creation and would generate revenue regionally, these jobs and revenue streams are not related to cargo container activities.

Construction

Land Use. All three action alternatives involve construction, demolition, rehabilitation, and renovation activities on Base Seattle and any acquired property, which would directly impact surrounding land uses. These activities and impacts would be temporary in nature and consistent with ongoing activities in the surrounding area that are associated with the industrial waterfront uses, including those associated with Base Seattle and the Port operations.

Activities such as equipment movement/changes in traffic patterns, heavy machinery usage, materials storage, and the construction of new facilities would be noticeable to surrounding land uses, both on- and off-Base. As indicated above, these elements are routinely associated with ongoing construction and industrial operations in the Duwamish MIC and would not represent a measurable change in land use conditions. Base Seattle would continue to be used for the substantially the same land uses during construction (i.e., water-related and water-dependent uses). There would be no spillover (i.e., indirect) land use effects in surrounding areas because all construction activities would be within existing and acquired properties. Further, these activities would not have the potential to influence or impact the function or character of regional communities or entertainment venues. For a discussion of anticipated traffic impacts, refer to Section 3.4, *Transportation*.

In preparation for and during project activities, existing Coast Guard functions would need to be temporarily relocated. Some of these functions would be relocated on a project-by-project basis to temporary facilities (e.g., trailers, modular structures) within the boundaries of the expanded Base Seattle or to Building 7. No off-site land use would be affected by these temporary relocations and all project-related activities would be consistent with surrounding land use. (See Chapter 4, *Cumulative Impacts*, regarding Coast Guard temporary use of portion of Terminal 46 as part of CERCLA action in Slip 36.)

Laydown areas during construction, renovation, and demolition activities would be established entirely within Base Seattle. While internal traffic management planning would be necessary to address potential access and circulation issues, they would not have the potential to impact offsite land use.

Installation of construction fencing during development activities is a standard safety practice but would limit access to areas within the Base and any acquired property. Because these areas are already under restricted access for security reasons, safety fencing to restrict movement would be consistent with current land use practices.

Coastal Zone Management. Stormwater runoff and fugitive dust generation during facility construction activities are the primary considerations for the CZMA consistency review (refer to Appendix G). Stormwater runoff impacts are expected to be minor because the Stormwater Pollution Prevention Plan (SWPPP) would be required for larger construction projects to ensure potentially hazardous materials and construction-generated sediments do not enter adjacent surface waters. Furthermore, ECMs would be required to reduce stormwater runoff and fugitive dust emissions for all projects (see Appendix E).

Long-term Operations

Potential effects to land use under long-term operation of the modernized Base would result from expanded security infrastructure, increased tempo of shoreside support operations, and an increased number of permanent buildings. Within the Base, proposed infrastructure improvements and construction projects would address existing operational inefficiencies and land use incompatibilities, and would result in a long-term beneficial impact to on-Base land uses. Increased traffic volumes, including increased personnel commutes as well as ongoing concurrent construction trips, are anticipated under each alternative. These increases would be noticeable locally but are not expected to adversely affect land use activities associated with regional sports stadiums or coastal access (see Section 3.4, *Transportation*).

Under each action alternative, AT/FP infrastructure—perimeter fencing, security gates, and lighting—would be upgraded from current conditions but consistent with restricted access infrastructure in use at both Base Seattle and the Port (i.e., including the acquired properties). Long-term operation of this infrastructure would be consistent and compatible with surrounding industrial and port-specific land uses. Long-term enforcement of the security buffer, both landside and waterside, is consistent with current operations and requirements implemented by the Coast Guard for Base Seattle and by the Port at all its properties.

Although infrastructure (e.g., buildings, utilities, pavements) would be expanded upon program completion, the net footprint of built areas pre- and post-project are approximately the same, and Base Seattle is already heavily developed. In the context of surrounding industrial and water-dependent land use, the Proposed Action is consistent with ongoing and forecast activities.

3.1.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Land Use. Alternative 1 varies from the other action alternatives in the following ways:

- Acquisition of up to 53 acres at Terminal 46 and the 1.1-acre Belknap property, resulting in a land use change
- Comparatively greater construction and expansion of fencing and other AT/FP measures to establish access control at newly acquired properties

Coast Guard use of the acquired property would be consistent with existing surrounding industrial uses. Acquisition of the property would displace current cargo storage land uses at Terminal 46 (described further in Section 3.7, *Socioeconomics*) and, because Terminal 46 is underutilized at present, it would preclude future uses of the property for container ship or cruise ship operations. While these uses could be relocated elsewhere on Port property, it is not known to what degree. Ongoing Port improvement and modernization projects are also being implemented to increase Port capacity without changing land use or areal coverage. The longshoremen's training center could potentially continue to be accommodated on remaining available acreage at the northern end of Terminal 46. See Chapter 4, *Cumulative Impacts*, for additional discussion on these projects. Nevertheless, acquisition of these lands would result in a substantial loss of commercial Port uses that would be unlikely to be completely relocated within the Port of Seattle.

As described above, Alternative 1 would be inconsistent with the City's Comprehensive Plan goals and objectives, as well as the policies of the Container Port Element of the City's Comprehensive Plan, that seek to preserve industrial and Port lands in the Greater Duwamish MIC for the economic benefit of the City.

Implementation of Alternative 1 would result in long-term, significant, adverse impacts associated with removal of up to 54 acres from Port of Seattle use. While the Coast Guard use of these acquired lands would be consistent with existing uses and planned industrial uses for the Greater Duwamish MIC, the acquisition would result in displacement of existing land uses, and the associated loss of jobs and economic revenue from these lands. Therefore, the acquisition would be inconsistent with the polices of the City's Comprehensive Plan and the Port Container Element that seek to reserve these lands for Port and other industrial uses, and provide the associated jobs and revenue to the City.

The impact to land use from acquisition of land cannot be mitigated because these lands would be removed from Port use and could not be replaced or offset. Under Alternative 1, the Coast Guard is seeking to minimize the impact to land use through purchase of only that acreage that is required to support its operations; specifically acquisition of 28 or 24 acres of Terminal 46 instead of 53 acres.

Alternative 1 would have a significant impact on land use by potentially displacing current and future industrial land uses, and because of the inconsistency with the City's Comprehensive Plan objectives to retain lands for Port and industrial uses.

Coastal Zone Management. In compliance with CZMA, a Coastal Consistency Determination (CCD) has been prepared to evaluate the consistency of Alternative 1 (the Preferred Alternative) with the enforceable policies of the State's Coastal Management Program (see Appendix G). Pursuant to the CZMA, the Coast Guard has determined that the Alternative 1 would be implemented in a manner consistent to the maximum extent practicable with the federally approved enforceable policies of the WCZMP.

Pursuant to NEPA, Alternative 1 would have long-term, significant impacts on land use, and no significant impact on coastal resources.

3.1.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

Land Use. Alternative 2 varies from the other action alternatives in the following ways:

- Acquisition of the MITAGS property (approximately 1.07 acres), Belknap Property (1.1 acres), a portion of Terminal 46 (approximately 5.5 acres), the BNSF Railway property (0.33 acre), and a portion of Terminal 30 including Jack Perry Memorial Park (approximately 13.5 acres, but potentially 21.5 acres)—a total of approximately 21.2 to 29.2 acres
- Comparatively less expansion of fencing and other AT/FP measures based on smaller total acquisition area

Impacts associated with Alternative 2 would be comparable to those described for Alterantive1 above. While land acquisition under Alternative 2 would displace existing land uses, the total acreage would be less than under Alternative 1 and the Port's capacity to support cargo operations would be reduced by less than 3 percent (see Section 3.7). It would also displace loss uses and berthing capacity at Terminal 46. Alternative 2 would also displace the MITAGS facility (currently leased from the Port), which could potentially be relocated off-site, but this outcome cannot be predicted at present (see Section 3.7 regarding evaluation of impact of loss of this educational value). Alternative 2 would similarly be inconsistent with policies outlined in the City's Comprehensive Plan and the Container Port Element. Alternative 2 would have a significant impact on land use by displacing current and future industrial land uses, and because of the inconsistency with the City's Comprehensive Plan objectives to retain lands for Port and other industrial uses.

Coastal Zone Management Act. While a full consistency review has not been prepared for Alternative 2, because Alternative 2 is substantially similar to Alternative 1, the consistency of Alternative 2 with the WCZMP can largely be derived from the CCD for Alternative 1. The only substantial difference relevant to consistency review under Alternative 2 would be the displacement of Jack Perry Memorial Park. The Washington Shoreline Management Act has a major goal to increase recreational opportunities for the public in the shoreline. The City of Seattle SMP further states it is one of the purposes of the SMP to "Provide for maximum public access to, and enjoyment of the shorelines of the City." Alternative 2, by eliminating Jack Perry Memorial Park, would not be consistent with the public access objectives of the WCZMP. No other enforceable policies would apply under Alternative 2 that are not otherwise evaluated for Alternative 1, and consistency of Alternative 2 would otherwise be comparable to that of Alternative 1. Pursuant to the CZMA, the Coast Guard has determined that the Alternative 2 would be implemented in a manner consistent to the maximum extent practicable with the federally approved enforceable policies of the WCZMP.

Pursuant to NEPA, Alternative 2 would have long-term, significant impacts on land use, and no significant impacts on coastal resources.

3.1.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

Land Use. Alternative 3 varies from the other action alternatives in the following ways:

- Acquisition of the MITAGS property (approximately 1.07 acres), the Belknap property (approximately 1.1 acres), the BNSF Railway property (approximately 0.33 acre), and a portion

of Terminal 46 (approximately 21.75 acres, but potentially up to 29.75 acres)—a total ranging from approximately 24.25 to 32.25 acres

- Less expansion of fencing and other AT/FP measures based on smaller acquisition area than under Alternative 1, but slightly greater expansion of such measures compared to Alternative 2

Impacts associated with Alternative 3 would be comparable to those described for Alternative 1 above. While land acquisition under Alternative 3 would displace existing land uses, the total acreage would be less than under Alternative 1 and Port's capacity to support cargo operations would be reduced by less than 0.6 percent. Alternative 3 would similarly be inconsistent with policies outlined in the City's Comprehensive Plan and the Container Port Element. Alternative 3 would have a significant impact on land use by displacing current and future industrial land uses, and because of the inconsistency with the City's Comprehensive Plan objectives to retain lands for Port and industrial uses.

Coastal Zone Management Act. As described for Alternative 2, a full consistency review has not been prepared for Alternative 3. Because Alternative 3 is substantially similar to Alternative 1, the consistency of Alternative 3 with the WCZMP can largely be derived from the CCD for Alternative 1. Alternative 3 is substantially similar to Alternative 1, and would not result in the loss of Jack Perry Memorial Park as under Alternative 2. No other enforceable policies would apply under Alternative 3 that are not otherwise evaluated for Alternative 1, and consistency of Alternative 3 would otherwise be comparable to that of Alternative 1. Pursuant to the CZMA, the Coast Guard has determined that the Alternative 3 would be implemented in a manner consistent to the maximum extent practicable with the federally approved enforceable policies of the WCZMP.

Pursuant to NEPA, Alternative 3 would have long-term, significant impacts on land use, and no significant impacts on coastal resources.

3.1.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, no land acquisition would occur. The Coast Guard would continue leasing 1.1 acres of the Port-owned Belknap property to enable implementation of their ongoing mission activities. Additionally, the recently approved short-term (39-month) lease of Terminal 46 property from the Port of Seattle to the Coast Guard would be remain in effect through its expiration. Neither the MITAGS facility nor Jack Perry Memorial Park would be displaced or impacted. No modernization efforts would be implemented at the Base. Existing operational inefficiencies would remain, and Base infrastructure and facilities would remain inadequate to accommodate the arrival of new vessels or personnel. Although this alternative leaves existing land use inefficiencies unresolved and does not support the Coast Guard's programmed redistribution of assets in support of mission accomplishment, no significant direct or indirect impacts would be expected on land use at Base Seattle.

Under this alternative, existing CZM conditions would remain unchanged, resulting in no significant impacts to CZM considerations.

3.1.6 Comparison of Alternatives

All action alternatives affect land use at Base Seattle similarly.

Land Use Impacts. Contemplated land uses, development, and operations at the Base under all action alternatives would be consistent with existing water-dependent and upland industrial land uses in the Greater Duwamish MIC. Alternative 1 would result in the greatest area of land acquisition and accompanying displacement of existing and potential future Port operations, as shown in Table 3.1-2.

Only Alternative 2 would result in a change in the type of land use as a result of the acquisition of Jack Perry Memorial Park and conversion of this recreational land use to industrial.

Table 3.1-2 Comparison of Alternatives for Port Operations

Alternative	Berthing space acquired (feet)	Individual Terminal Area lost (acres)	% of Total Port Acreage lost	% of Total Container Terminal Acreage lost
Alternative 1	T-46: 1,070	T-46: 26 to 53	0.7 to 1.3	2.1 to 4.2
Alternative 2	T-30[1]: 570	T-30: 13.5 to 21.5 T-46: 5.5	0.5 to 0.7	1.5 to 2.1
Alternative 3	T-46: 560	T-46: 21.75 to 29.75	0.5 to 0.7	1.7 to 2.4
No-Action[2]	T-46: 1,100	T-46: 18	0.5	1.4

[1]Waterfront would be acquired at Terminal 30 with new wharf to be constructed.
[2]No-Action Alternative impacts to Port-owned property would be short-term due to a lease with Coast Guard executed in July 2022 for 39 months (expires September 2025).

Land Use Plans and Policies. A summary and comparison of alternatives with respect to consistency with the City's Comprehensive Plan and Container Port Element is provided in Table 3.1-3, with a brief explanation immediately following (a more complete presentation of these policies is provided in Section 3.1.2, *Approach to Analysis*).

Table 3.1-3 Summary and Comparison of Alternatives with City's Comprehensive Plan

Container Port Element Land Use Policy	Alternative 1	Alternative 2	Alternative 3	No-Action
CP1 (preserve cargo container activities)	**Inconsistent**	**Inconsistent**	**Inconsistent**	NA
CP2 (monitor land needs, including for expansion)	**Inconsistent**	**Inconsistent**	**Inconsistent**	NA
CP3 (discourage non-industrial such as retail, residential)	Consistent	Consistent	Consistent	NA
CP4 (consider zoning designations with respect to jobs and revenue related to cargo container activities)	**Inconsistent**	**Inconsistent**	**Inconsistent**	NA

The No-Action Alternative would leave existing internal inefficiencies and shortfalls unresolved and would not facilitate accomplishment of the Coast Guard's purpose and need (refer to Section 1.3); however, it would not result in significant land use impacts.

Coastal Zone Management.

As shown in Table 3.1-4, all action alternatives would be consistent to the maximum extent practicable with the enforceable polices of the WCZMP. Alternative 2, while still consistent to the maximum extent practicable, would not be consistent with policies that seek to retain or increase public access as a result of the acquisition of Jack Perry Memorial Park. None of the action alternatives would have a significant impact on coastal resources.

Table 3.1-4 Comparison of Alternatives with Respect to Consistency with SMA Enforceable Preferential Uses[1]

Policy	Alternative 1	Alternative 2	Alternative 3	No-Action
Recognize and protect the statewide interests over local interests	Consistent	Consistent	Consistent	Consistent
Preserve the natural character of the shoreline	Consistent	Consistent	Consistent	Consistent
Result in long-term over short-term benefit	Consistent	Consistent	Consistent	Consistent
Protect resources and ecology of the shoreline	Consistent	Consistent	Consistent	Consistent
Increase public access to publicly owned areas of the shorelines	Consistent	**Inconsistent**	Consistent	Consistent
Increase recreational opportunities for the public in the shoreline	Consistent	**Inconsistent**	Consistent	Consistent

[1] NOAA's Office of Coastal Management (OCM) identifies an enforceable policy as "a state policy that is legally binding under state law (e.g., through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions), and by which a state exerts control over private and public coastal uses and resources, and which are incorporated in a state's federally approved CMP." CZMA § 304(6a) and 15 CFR. §930.11(h).

Table 3.1-5 Comparison of Alternatives for Land Use

Comparison of Alternatives for Land Use Impacts	
Alternative 1	Significant impacts to land use. Consistent to the maximum extent practicable with the enforceable polices of the WCZMP.
Alternative 2	Significant impacts to land use. Consistent to the maximum extent practicable with the enforceable polices of the WCZMP (less consistency due to loss of public coastal access from acquisition of Jack Perry Memorial Park).
Alternative 3	Significant impacts to land use. Consistent to the maximum extent practicable with the enforceable polices of the WCZMP.
No-Action Alternative	No significant impacts.

3.1.7 Environmental Conservation Measures

Each of the alternatives includes the implementation of ECMs that have been identified and their implementation serves to avoid or further minimize any adverse temporary or operational impacts. Details regarding implementation and compliance with these measures are provided in Appendix E.

3.2 Geological Resources

Summary of Findings

The Proposed Action, Action Alternatives, and No-Action Alternative would not directly exacerbate the potential or intensity of any geological hazards. All of the Action Alternatives would have beneficial indirect impacts from increased structural resiliency and safety compared to the No-Action Alternative. No significant impacts related to geologic resources or geological hazards would occur.

3.2.1 Background

Geological resources refer to the geology, soils, and topography in a Project area, while geological hazards refer to the natural hazards that directly or indirectly arise from the intersection of the underlying geology, soils, and topography with the Proposed Action. Geological hazards in the region include earthquakes, landslides, tsunamis, and volcanic activity. A presentation of these conditions and hazards with potential to affect or be affected by implementation of the Proposed Action, either in the Project area itself or proposed infrastructure development, is described in Section 3.2.2.

Geology refers to the underlying rock that supports the overlying soil, water, vegetation, and human environment. An area's geology is typically described by the rock type, age, and composition as well as the presence or absence of structural features, such as faults, that contribute to shaping the surrounding landscape and define the potential for geophysical hazards to occur, namely earthquakes.

Soil refers to unconsolidated materials overlying bedrock or other parent material (i.e., material from which soil horizons form). Soils are typically described in terms of their type, slope, physical characteristics, and relative compatibility or constraining properties with regard to particular construction activities and types of land use. Soil structure, elasticity, strength, shrink-swell potential, and erodibility all determine the ground's ability to be subject to displacement and to support man-made structures, especially under conditions where the land surface may become unstable resulting in liquefaction and/or lateral spreading during earthquakes (see Geological Hazards discussion below).

Topography is the change in elevation over the surface of a land area. An area's topography is influenced by many factors, including human activity, underlying geologic material, seismic activity, climatic conditions, and erosion. Topography influences the potential for landslides to occur, generally increasing in probability in steep areas and reducing to zero in flat-lying areas.

Geological Hazards

Earthquakes. Earthquakes are shaking caused by movement along faults, fractures in the underlying geology, or volcanic activity. Of the geophysical hazards with potential to occur in the greater Seattle area, earthquakes are the most significant (City of Seattle 2019). This is because, aside from the ground-shaking itself, earthquakes have the potential to trigger or activate other geological hazards such as liquefaction and lateral spreading, landslides, and tsunamis. As described in the City's *Seattle Hazard Identification and Vulnerability Analysis*, consequences of an earthquake in Seattle could include building collapse, lateral spread, fires, liquefaction, and potentially a tsunami or a seiche (City of Seattle 2019).

Liquefaction and Lateral Spreading. Liquefaction occurs when an earthquake causes soils to be less rigid and behave like a liquid. It usually occurs in water saturated soils that are loosely packed, similar to the soils in and around Base Seattle. Liquefaction can cause soils to spread laterally where there are no natural or manmade containment (e.g., concrete bulkheads). This results in the destruction or damage of man-made facilities and can cause serious risks to human safety.

Tsunamis and Seiches. Tsunamis are waves most often caused by earthquakes or large landslides but may occasionally be caused by volcanic eruptions. Seiches are standing waves in enclosed waterbodies that are most often caused by seismic waves comparable to water sloshing back and forth in an enclosed basin, like a bathtub or swimming pool. These waves can occur at great distances (hundreds or thousands of miles) from an earthquake epicenter. Because they are standing waves, they move vertically more than horizontally, allowing them to wash over areas that are above typical wave elevations.

Landslides. A landslide is the movement of a mass of soil, rock, or debris down a slope. Landslides occur when the force of gravity on a slope exceeds the strength of the earth materials that compose the slope. Factors influencing landslide potential include cumulative rainfall and rainfall intensity-duration (U.S. Geological Survey [USGS] 2020). Erosion, earthquakes, prior landslides, and human activity also influence landslide potential.

3.2.2 Approach to Analysis

Effects associated with the geological environment are analyzed to determine if they would alter geologic resources (e.g., geology, soils, and topography). Impacts on geological hazards (e.g., earthquakes, liquefaction and lateral spreading, tsunamis and seiches) are analyzed to determine if they are exacerbated such that they would occur with greater frequency or intensity. Impacts might arise from removal of soils during construction or increased aerial and water erosion from construction and operations. Impacts on soils are analyzed to determine if soils are destabilized beyond the capabilities of required soil management BMPs.

The Coast Guard considered the geologic history and known geological risks at the site when determining the potential impacts, including whether the activities associated with the action alternatives would increase the likelihood and/or scale of a geological hazard that could affect Base Seattle. Development of an area such as that proposed at Base Seattle would not increase frequency or intensity of hazards such as earthquakes. The Coast Guard also considered information regarding the resiliency of planned facilities to geological hazards whose likelihood of occurrence and intensity cannot be directly affected by human action. The resiliency of those structures to withstand the effects of these geological hazards would be affected by changes proposed as part of such a development. For example, older structures could be redeveloped to modern seismic codes (e.g., American Society of Civil Engineers [ASCE] Standard 41, *Seismic Rehabilitation of Existing Buildings*), which would increase a structure's resistance to earthquake shaking. Results of this consideration are presented in Table 3.2-1. With regard to scale, this qualitative analysis considers the potential scope of damage to structures and functions at Base Seattle resulting from a geological hazard.

For the purposes of this analysis, the Project area and impact area are the same because construction at Base Seattle may affect some geological hazards (such as the potential for soil erosion) while regional scale geological hazards may affect Base Seattle. The analysis of construction-related impacts considered activities that would result in physical changes at Base Seattle that would potentially exacerbate geological hazards. Compliance with seismic or other building codes (i.e., International

Building Code [IBC] and relevant Coast Guard Configuration Standard Technical Orders [CSTOs]) would also alter resilience of existing or new structures at Base Seattle.

Table 3.2-1 Geological Hazards and Effect on or by Project Alternatives

Geological Hazard	Hazard Affecting Project Alternatives	Hazard Affected by Project Alternatives
Earthquakes	Yes	No
Liquefaction/Lateral Spreading	Yes	Yes
Tsunami/Seiche	Yes	No
Landslide	Yes	Yes

3.2.3 Affected Environment

Geologic Resources

Geology. The Seattle region's present-day geology is largely the product of tectonic activity and glacial movement modified by human activity over centuries, where portions of the natural tidal flats along Elliott Bay have been expanded with artificial fill (i.e., imported soils) and waste materials. The vicinity of Base Seattle and the surrounding area, including Terminals 30 and 46 and neighboring Harbor Island, are characteristically underlain by tideflat deposits composed of silt, sand, organic sediment and detritus, and shells deposited during the recent Holocene epoch (i.e., less than 11,650 years) (Troost et al. 2005). Beyond the natural tideflat deposits, the area of Base Seattle and surrounding Port of Seattle terminals has been raised and leveled with artificial fill prior to or during construction of these maritime facilities (Yount et al. 1993).

Soils. Base Seattle, the surrounding Port of Seattle Terminals 46 and 30, and Jack Perry Memorial Park consist of the Urban Land soil type, which is composed of looser fill soils that are prone to liquefaction (U.S. Department of Agriculture [USDA] Natural Resources Conservation Service [NRCS] 2020). The Urban Land soil designation is not considered a sensitive soil (e.g., capable of supporting farmland crops) protected under any law or regulation.

Topography. Base Seattle and the surrounding Terminals 30 and 46 are low-lying facilities constructed on artificial fill overlying tideflat deposits with no natural topography present. Base Seattle is located within 50 feet of sea level at the lowest downstream point of the Duwamish-Green River watershed (see Section 3.3, *Water Resources*)

Geological Hazards

Earthquakes. The Seattle region is at risk for earthquakes from three sources: (1) deep earthquakes, (2) shallow earthquakes along the Seattle Fault and others, and (3) megathrust earthquakes. Deep earthquakes occur at depths of 30 to 70 kilometers (km) in oceanic crust. Because of the depth, damage to structures and liquefaction events are less likely to occur but may occur during strong events, such as the 2001 Nisqually earthquake (City of Seattle 2019). Deep earthquakes are the most common large earthquakes that occur in the Puget Sound region.

Shallow earthquakes, typically between 0 and 30 km below the surface, are expected on the Seattle Fault Zone, which is the primary, but not only, source for this type of earthquake in Seattle. Shallow earthquakes are Seattle's most dangerous source for potential earthquakes (City of Seattle 2019). While rare, a magnitude 7.5 Seattle Fault earthquake is estimated to have a 1 in 5,000 chance of occurring in any given year. Smaller magnitude (less than 7.0) earthquakes are more probable. Base Seattle, all of

Terminal 30, and the half of Terminal 46 closest to Base Seattle are located within the mapped extent of the Seattle Fault Zone (Troost et al. 2005).

In the greater Pacific Northwest, subduction zone earthquakes occur along the Cascadia megathrust; the fault separating the North American plate and the Juan de Fuca plate off the Pacific Coast of North America (City of Seattle 2019). These faults can generate earthquakes of magnitude 9.0 or greater. Because Seattle could be up to several hundred miles from an earthquake epicenter, seismic waves would generally weaken slightly before they reach the City (i.e., as they cross the Olympic Peninsula). While shaking would be violent and prolonged, it would be of lower intensity and less damaging compared to events along the Seattle Fault (City of Seattle 2019).

The Seattle area's vulnerability to earthquake shaking is influenced by the underlying Seattle Basin; a roughly 7 km deep geologic basin filled with glacial deposits, sediments, and sedimentary rock (City of Seattle 2019). Areas such as the Seattle Basin with unconsolidated material experience amplified and prolonged durations of ground shaking during earthquakes relative to areas that are anchored to solid bedrock. As mapped by the USGS, the Seattle area is identified as having the potential for the greatest levels of shaking during a seismic event due to its underlying geology (i.e., artificial fill, soft soil) (City of Seattle 2020a). Approximately 15 percent of Seattle's total area is soil that is prone to ground failure in earthquakes (City of Seattle 2019).

Liquefaction and Lateral Spreading. Base Seattle, Port Terminals 46 and 30, and Jack Perry Memorial Park are located in an area mapped as prone to liquefaction. The Urban land soils at Base Seattle are composed of artificial fill emplaced to create the Seattle waterfront. Artificial fill at the surface overlies tidal flat deposits composed of silt, sand, organic sediment, and detritus. The tidal flat deposits are underlain by unconsolidated glacial till at depth. The soils and sediments at Base Seattle are loosely compacted, and under seismic loading can liquify and result in lateral spreading.

The shoreline in the vicinity of Base Seattle is stabilized by bulkheads that hold the surface soils in place and prevent soil spreading into the Duwamish Waterway or Elliott Bay. For this reason, earthquakes that damage or destroy the bulkheads may permit lateral spreading into surrounding water bodies (i.e., Elliott Bay, Duwamish Waterway). Although few permanent structures are currently developed on Terminals 46 and 30, aside from large container-cargo cranes, these Port of Seattle facilities are underlain by the same liquefiable soils and have the same associated geophysical hazards as Base Seattle.

Tsunamis and Seiches. Seattle Fault earthquakes present the greatest potential for causing a tsunami in Seattle. Substantial movement on this fault could trigger a tsunami that could strike the Seattle shoreline within seconds of the earthquake and flood it within 5 minutes (City of Seattle 2019). The low-lying areas around the downtown sports stadiums, interbay, and Harbor Island, including Base Seattle and the remainder of the Project area, could experience tsunami inundation up to 20 feet at the Elliott Bay shoreline on the Seattle Fault (City of Seattle 2020a; Washington Department of Natural Resources 2022). Other faults potentially capable of producing tsunamis in Puget Sound include the Tacoma Fault, South Whidbey Island Fault, Strawberry Point Fault, Utsalady Point Fault, and Darrington Devils Mountain Fault Zone. Tsunamis that originate in the Pacific Ocean, including Cascadia subduction zone earthquakes, do not pose a major threat to Seattle because Puget Sound's shape and complex shoreline would dampen them before they reach Seattle (City of Seattle 2019).

Based on modeling, the most damaging seiche would likely be caused by a Cascadia subduction zone earthquake. A seiche on Elliott Bay—or within individual, enclosed, hard-sided boat basins, such as Base

Seattle—could result in damage to port and industrial facilities, including Base Seattle and the remainder of the Project area (City of Seattle 2020a).

Landslides. Landslides are common in Seattle due to its topography and climate (i.e., steep hills, wet winters). Shallow landslides are common on coastal bluffs on the Puget Sound (USGS 2020). An estimated 8.4 percent of the City's surface is covered by areas identified as "slide prone" in the City's *Environmentally Critical Areas Ordinance* (City of Seattle 2021a). Additionally, a Seattle Fault earthquake could cause massive landslides in the City. The USGS has created a gauge to show when Seattle has a heightened risk of landside. The upland Project area however is not located in the immediate proximity of any steep slopes, where debris flows could originate and flow over the Project area and is not located in a potential landslide area (City of Seattle 2020a).

Underwater landslides at Base Seattle and at Terminals 46 and 30 could occur if earthquakes cause shoreside bulkheads to fail and soil liquefaction, resulting in lateral spreading of the subsurface soils into the Duwamish Waterway or Elliot Bay.

3.2.4 Environmental Consequences of the Action Alternatives

Potential project-related impacts related to geological hazards associated with each of the principal components common to all three action alternatives are described here. Sections 3.2.4.1 through 3.2.4.3 provide a description of impacts that are unique to each action alternative. This section concentrates on the changes to the environment that could occur due to the Proposed Action.

Land Acquisition

Based on the purely transactional nature of land acquisition, this component of the proposed modernization would have no potential to directly or indirectly impact geological resources such that intensity or frequency of geological hazards would be increased from current conditions.

Construction

All three action alternatives would result in construction, demolition, rehabilitation, and renovation activities on Base Seattle and any acquired properties. These activities would require use of heavy machinery and ground disturbance that would alter the land surface and subsurface in the upland portion of Base Seattle, as well as submerged lands where in-water work would occur. These activities would not alter the relatively flat topography of Base Seattle. The scale of soil disturbance would be roughly proportional to the total Project area under each alternative due to installation of stone columns and development of structures (i.e., Alternative 1 covering the largest area and Alternative 3 covering the smallest area).

Construction activities and, in particular, installation of stone columns or other ground stabilization methods, would directly alter subsurface geology. Subsurface activities as part of construction of more seismically resilient structures and installation of ground-stabilizing components would have a beneficial effect on surface stability during earthquakes and reduce the potential for liquefaction, all of which would increase the safety of Base Seattle personnel.

Disturbance of the land surface could mobilize soils that could run off via stormwater into Elliott Bay. Implementation of ECMs would ensure that displaced soils would be stockpiled in stable piles, covered, and located so that they would not runoff into Elliott Bay (see Appendix E).

In-water work that would occur across all alternatives includes rehabilitation of the wharf area at the southern end of Terminal 46 adjacent to Slip 36, and includes replacement of piles and installation of new decking where portions of these structures have been deemed structurally deficient. Rehabilitation to meet current seismic codes and engineering standards would increase the resilience of the structure which would increase the safety of Base Seattle personnel and material.

The impacts of construction activities and their interactions with relevant geological hazards are described below.

Earthquakes. Under all action alternatives, certain facilities would be demolished or rehabilitated, and new or rehabilitated facilities would be designed to meet current seismic standards. These structural upgrades and construction would comply with IBC and ASCE standards for building and seismic codes to ensure an appropriate level of structural resilience in response to seismic hazards, primarily earthquakes both locally (i.e., Seattle Fault) or further afield (i.e., Cascadia subduction zone). All Base Seattle projects would comply with the applicable earthquake design standards, codes, policies, and federal Executive Orders (EOs). Structural upgrades to Building 7 would increase the structure's resilience to damage from earthquakes, which would result in a long-term beneficial indirect impact related to increasing the safety of personnel using the structure.

None of the potential project components would directly alter the likelihood of an earthquake and renovated or new structures would likely be more resilient than existing structures to earthquake damage. Therefore, there would be no direct impacts related to exacerbation of earthquake hazards under any of the action alternatives.

Liquefaction and Lateral Spreading. Demolition and construction activities under all action alternatives would include the installation of approximately 1,000 stone columns that are 100 feet deep to stabilize the upland portions of Base Seattle and reduce the potential for liquefaction and lateral spreading. Rehabilitation of portions of Terminal 46 would include the in-water replacement of piles and possibly reconstruction of new bulkheads, which would reduce the risk of underwater landslides due to bulkhead failure during earthquakes. Therefore, beneficial impacts related to liquefaction and lateral spreading throughout the respective project boundaries would occur under each action alternative, and be proportional to the size of new Base Seattle and acquired properties area that would determine the extent of area where ground stabilizing stone columns would potentially be installed.

Tsunamis and Seiches. The proposed structural upgrades under the action alternatives would have a beneficial impact on the resiliency of structures against potential tsunami or seiche waves. The reconstruction or rehabilitation of structures would not move them outside or above the mapped tsunami inundation zone, but would update older structures to comply with modern building codes and design standards (i.e., IBC requirements, ASCE standards, and Coast Guard CTSOs) for development within tsunami inundation areas. For instance, new structures would locate all non-industrial/ maintenance functions (e.g., administrative, dormitories, commercial, command and control, building systems) on the second floor or higher in each building. Industrial and maintenance functions would remain at ground level due to the nature of the work. All second floors would be at least 14 feet above ground level to allow a tsunami wave to flow through the ground floor of each building. This would keep the building's occupants and building systems (e.g., electrical; mechanical; heating, ventilation, and air conditioning [HVAC]; communications) safely above the water surface during a tsunami wave. Implementation of these measures would increase the facility's resilience to tsunami and seiche hazards and reduced potential damage from major to minor. This would result in beneficial impacts under each action alternative.

None of the potential project components would alter the likelihood of any tsunami or seiche occurring. Therefore, there would be no direct impacts related to exacerbation of tsunami or seiche hazards while compliance with relevant codes and project designs would result in beneficial impacts on structural resilience under any of the action alternatives.

Landslides. As stated above, Base Seattle and the surrounding area are not located at the Base of or in proximity to any steep slope that could produce landslides that would impact the project site. Further, no construction, demolition, or renovation activities associated with any of the action alternatives would steepen an existing slope such that landslides would be more likely to occur. Therefore, no direct impacts related to landslides are anticipated under any of the action alternatives.

In summary, all newly constructed or rehabilitated existing structures would be brought into compliance with the relevant building codes and standards to ensure the structures meet the resilience requirements to withstand geological hazards, to the extent feasible, pursuant to 40 USC §3312.

Implementation of the three action alternatives would increase the resilience of Base Seattle's new and reconstructed structures with respect to potentially damaging geological hazards. Compliance with current seismic codes would generally make buildings more resistant to earthquake-caused shaking. Installation of the stone columns would reduce the potential for soils to liquefy or spread during earthquakes, which would have the beneficial impact of reduced potential for these events to damage structures and harm personnel.

Long-term Operations

Under all action alternatives, the continued long-term operation of the modernized Base Seattle would not directly alter (beyond what was altered under the construction, demolition, rehabilitation, and renovation phase) any geological resources such that a geological hazard would be more likely to impact the project site. As stated above, compliance with relevant building and seismic codes would increase the resilience of the newly constructed structures for the life of the structures, which would have a beneficial impact on structure and personnel safety in response to geological hazards.

3.2.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

The structural designs described previously and implemented under Alternative 1 would reduce the potential for major damaging effects from seismic hazards to proposed structures where redevelopment within the Alternative 1 footprint would occur (i.e., expanding Base footprint by 53 acres to the north on Terminal 46). The modernized facilities at a redeveloped Base Seattle, including the acquired portions of Terminal 46, would be constructed to better withstand potential damage from earthquakes, tsunami and seiche waves, and liquefaction and lateral spreading, which would be considered a beneficial impact. No additional in-water work beyond what is described above is included in Alternative 1.

Beyond the consideration of how facilities would be constructed to be resilient to geological hazards, none of the construction methods proposed under Alternative 1 would directly affect the local geological resources (i.e., geology, soils, and topography) such that the likelihood and/or intensity of geological hazards would be increased. Therefore, no direct impacts related to exacerbating geological hazards would occur. Impacts related to liquefaction and lateral spreading following installation of the stone columns may be directly beneficial to land stability and indirectly to structures and personnel safety. Therefore, pursuant to NEPA, in total, no significant impacts associated with geological resources would occur.

3.2.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

With respect to upland geological resources and hazards, Alternative 2 varies from Alternative 1 only in the locations of structures (Figure 2.5-3), ground stabilizing measures (stone columns), and the extent of ground disturbance based on the difference in acquired properties. Disturbance would occur in a smaller area than Alternative 1 and focused primarily within the existing Base Seattle boundary, but including a neighboring portion of Terminal 30 and Jack Perry Memorial Park. The redeveloped Terminal 30 and Jack Perry Memorial Park areas would potentially include installation of stone columns to stabilize the land surface, which would be considered a beneficial impact as stated above. With regard to underwater stability and topography, the configuration, design, and extent of construction necessary to create the pier and berths at Piers 35E/F are unknown at this time, and these activities are expected to occur under a future CERCLA action (see Chapter 4, *Cumulative Effects*).

As in Alternative 1, redevelopment activities under Alternative 2 would not result in any physical changes to the project site that would directly increase the potential for a geological hazard event to occur. Alternative 2 would also increase resilience of structures at the project site to withstand hazards through compliance with seismic codes for new and redeveloped structures. Additional potential direct beneficial impacts to land stability and indirect beneficial impacts to structures and personnel safety would occur with potential installation of stone columns. Therefore, pursuant to NEPA, no significant impacts associated with geological resources would occur.

3.2.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

With respect to geological resources and hazards, Alternative 3 varies from Alternatives 1 and 2 only in the locations of structures (Figure 2.5-4), ground stabilizing measures (stone columns) The extent of ground disturbance based on the difference in land acquisition would occur in a smaller area than Alternatives 1 and 2 at Base Seattle and Terminal 46.

As with Alternatives 1 and 2, redevelopment activities under Alternative 3 would not result in any physical changes to the project site that would increase the potential for a geological hazard event to occur. Changes to the shoreline topography would occur with the construction of Pier 35E, and these activities are expected to occur under a future CERCLA action (see Chapter 4, *Cumulative Effects*). Alternative 3 would also increase resilience of structures at the project site to withstand hazards through compliance with seismic codes for new and redeveloped structures. Additional potentially direct beneficial impacts to land stability and indirect beneficial impacts to structures and personnel safety would occur with potential installation of stone columns. Therefore, pursuant to NEPA, no significant impacts associated with geological resources would occur.

3.2.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, the Coast Guard would not implement facility modernization requirements, and infrastructure enhancements, replacements, and upgrades at Base Seattle would not occur. Specifically, no rehabilitation work, which is necessary to meet current building and seismic safety standards, would occur at Base Seattle (i.e., seismic retrofit of Building 7) and no stone columns would be installed to stabilize the facility and reduce potential for liquefaction and lateral spreading. While no upgrades to the resiliency of the Base Seattle structures would occur, construction activities would not alter the potential for geological hazards to affect the facility. Therefore, the No-Action Alternative would have no significant impacts related to geologic resources or geological hazards.

3.2.6 Comparison of Alternatives

Under all action alternatives, potential impacts from geological hazards would be similar and would only differ relative to the size and configuration of the Base Seattle alternatives. The severity of expected impacts associated with geological resources between all action alternatives would be similar, lessened from current conditions and the No-Action Alternative, and minor in both the short- and long-term. All of the action alternatives would result in greater resilience of Coast Guard facilities to geological hazards relative to the No-Action Alternative. In summary, while there are minor differences, all action alternatives would, pursuant to NEPA, have no significant impacts related to geologic resources.

Table 3.2-2 Comparison of Alternatives for Geological Hazards

Comparison of Alternatives for Geological Resource Impacts	
Alternative 1	No significant impacts.
Alternative 2	No significant impacts.
Alternative 3	No significant impacts.
No-Action Alternative	No significant impacts.

3.2.7 Environmental Conservation Measures

Each of the alternatives would include the implementation of ECMs. Although no significant impacts associated with geologic resources have been identified, implementation of some measures (e.g., rehabilitating existing or constructing new structures in compliance with relevant seismic and building codes) would serve to avoid or further minimize any adverse temporary or operational impacts associated with geologic resources. Any ECMs noted in Appendix E related to Geological Resources would apply to all of the action alternatives. For further details regarding these measures and how they would be implemented, see Appendix E.

3.3 Water Resources

Summary of Findings

The Proposed Action and its Action Alternatives all have to potential to impact surface water quality through runoff, construction-related spills, and installation of seismic stabilization. All of the Action Alternatives would remove creosote-treated timber piles from Terminal 46. The removal of piles would cause a direct beneficial impact. It is assumed that any necessary CERCLA action (see Chapter 4, *Cumulative Impacts)* would occur prior to the implementation of any Action Alternative. The presence of contaminated sediments in water could result in a minor amount of contaminants being released into the environment.

The Proposed Action and its Action Alternatives also have the potential to impact groundwater either directly through subsurface disturbance or indirectly through increased percolation of surface water to groundwater. It is assumed that if any removal action is necessary to prevent contamination percolation, it would be completed prior to implementation of the Proposed Action. No Significant Impacts to water quality would occur.

The Proposed Action, Action Alternatives, and No-Action Alternative would not alter any floodplain or add a flood-prone structure within the floodplain.

3.3.1 Background

There are two main types of water resources that are considered within this analysis: surface water and groundwater. Surface waters include streams, rivers, lakes, and various other freshwater, estuarine, and marine water bodies. Groundwater comprises the water stored in subsurface reservoirs such as soil or porous rocks (i.e., aquifers). Water quality describes the chemical (e.g., dissolved solids) and physical composition (e.g., temperature) of water as affected by natural and human activities.

USEPA monitors surface water quality at the federal level and the Department of Ecology monitors it at the state level. These agencies work together to prepare the State's Clean Water Act Section 303(d) list of impaired waters. This list tracks the impaired and threatened waters within a state. The state identifies the pollutant (or stressor) causing the impairment and assigns a priority for development of Total Maximum Daily Loads (TMDLs) based on the severity of the pollution and the sensitivity of the uses (40 CFR §130.7[b][4]).

Groundwater quality is monitored at the state level by the Department of Ecology for compliance with standards set forth in Washington Administrative Code (WAC) Chapter 173-200 (Water Quality Standards for Groundwaters of the State of Washington).

This section also discusses floodplains, which in coastal locations such as Base Seattle, are generally flat areas surrounding surface waters that are periodically inundated during heavy precipitation and/or tidal events.

Floodplain management occurs pursuant to EO 11988, which requires federal agencies to avoid development within 100-year floodplains, to the extent practicable, and minimize the destruction or loss of floodplains.

Existing domestic water demand at Base Seattle is provided via the City of Seattle's water system as discussed further in Section 3.11, *Utilities and Public Services*.

3.3.2 Approach to Analysis

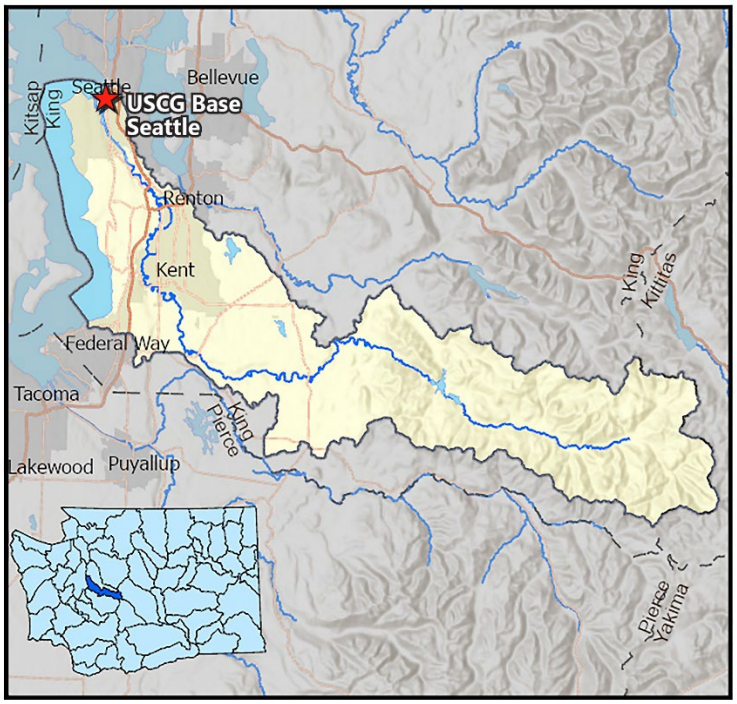
This analysis considers existing surface water quality, groundwater quality, and floodplain conditions within Base Seattle, the adjacent Port of Seattle properties, and the east branch of the lower Duwamish River, which flows into Elliott Bay. Base Seattle is located at the downstream end of the Duwamish River watershed where it flows into Elliott Bay. The area is tidally influenced. The construction and long-term operations phases of the Proposed Action include activities that could result in impacts to water quality. Impacts may be caused by spills, ground disturbance, and changes in the amount of runoff. Impacts could extend into nearby portions of Elliott Bay.

This analysis considers the potential for the impacts of the Alternatives to cause a compounding effect on existing TMDLs, cause exceedances to water quality standards, or violate any water resource regulations.

The floodplain analysis in this PEIS considers if development encroaching within a floodplain would: (1) have a high probability of loss of human life; (2) have substantial, encroachment-associated costs or damage; or (3) cause adverse impacts on natural and beneficial floodplain values.

3.3.3 Affected Environment

The Puget Sound/Elliott Bay Estuary complex, which is the second largest estuary in the U.S., encompasses a total water area of approximately 1,000 square miles and drains approximately 17,000 square miles. It is referred to as the Puget Sound Basin. This basin is bounded by the Cascade Mountains to the east and Olympic Mountains to the west. Base Seattle is located along the East Waterway of the lower Duwamish River and along the southeastern shore of Elliott Bay. The lower Duwamish River is the 7-mile long, downstream portion of the Green-Duwamish River Watershed (Elliott Bay Trustee Council [EBTC] 2009) The lower Duwamish River is the tidally influenced portion of the watershed where freshwater from the upstream portions of the watershed mixes with the marine waters of Elliott Bay. The tidal influence diminishes upstream away from Elliott Bay where the tidal influence is greatest (King County 2001). The Duwamish River is a heavily traveled and industrialized river. Elliott Bay is classified as an Estuarine Deepwater Marine Wetland and is subject to federal Clean Water Act (CWA) regulations for jurisdictional waters (U.S. Fish and Wildlife Service [USFWS] 2021; see Section 3.6, *Biological Resources*).



Green-Duwamish River Watershed (Washington Department of Ecology, 2022)

Groundwater in the Puget Sound Basin is stored in aquifer systems that are at and below the surface of the land. The aquifers are present along rivers, streams, and terraces throughout the region (Jones 1999).

Surface Water

Hydrologic Setting. In the early 1900s, the Duwamish River watershed and natural estuary were extensively modified by dredging and filling. The lower Duwamish River was modified from a 9.3-mile meandering tidal estuary to a 5.3-mile straightened channel, including the creation of Harbor Island and surrounding East and West Waterways (U.S. Coast Guard 2006). Today, the lower Duwamish River (including locations adjacent to the Port of Seattle and Base Seattle) is characterized by constructed bulkheads; manmade structures, including piers, wharves, and buildings extending over the water; and banks covered in riprap or other fill materials (EBTC 2009).

Water Quality. Water quality within Puget Sound is generally poor due to influences from the surrounding development (i.e., untreated surface runoff from urban and agricultural areas). The Department of Ecology estimates that Puget Sound is inundated with millions of pounds of toxic chemicals every year. These include oil, polychlorinated biphenyls (PCB), phthalates, and heavy metals such as lead, copper, and zinc. Stormwater runoff entering Puget Sound is a major contributor of these pollutants. Stormwater pollutant loads vary by entry point and upstream contamination (Department of Ecology 2017).

The area where the Duwamish Waterway (East Waterway) enters Elliott Bay at the southern portion of Base Seattle and Terminal 30 is included on the state's 2016 USEPA-approved, 303(d) list of impaired waters for dissolved oxygen and polycyclic aromatic hydrocarbons (PAH). This area is designated as a "Category 5: Polluted water that requires a water improvement project." This category is the most contaminated level. The area is also designated as a "Category 2: Water of Concern" for the contaminants listed in Table 3.3-1 (Department of Ecology 2022)[2]. The Department of Ecology is currently preparing the Puget Sound Nutrient Source Reduction Project to improve water quality by specifically addressing dissolved oxygen, dissolved inorganic nitrogen, and total organic carbon. This in-process water quality improvement project includes all waters within and adjacent to Base Seattle.

Areas of underwater sediment contamination are documented by the Department of Ecology (Table 3.3-1). The Coast Guard is coordinating with USEPA regarding the presence of contaminants in proximity to Base Seattle. The USEPA may recommend contaminated areas where in-water actions associated with Base Seattle would be cleaned up to meet Remedial Action Objectives under separate CERCLA actions (refer to Section 1.2.2, *Comprehensive Environmental Response, Compensation, and Liabilities Act Action at Base Seattle*).

[2] Additional contaminants may be present in the surface waters or underwater sediments of Elliott Bay and the lower Duwamish River in the vicinity of Base Seattle beyond those listed on the State's 303(d) list. These potential contaminants have not been assessed at levels where the Washington Department of Ecology has determined that they cause impairments of waterbodies and they have not been listed on the State's USEPA-approved 303(d) list.

Table 3.3-1 303(d)-Listed Contaminants in Surface Water and Underwater Sediments in Proximity to Base Seattle

Location	Ecology Assessment ID	Category 5 "Polluted Waters Requiring a Water Improvement Project" Contaminants	Category 2 "Water of Concern" Contaminants
Surface Water			
Southern Portion of Base Seattle Piers 35E/F	47122F3I4	High molecular weight PAH	Dissolved oxygen Bis(2-ethylhexyl)phthalates
Underwater Sediment			
Slip 36	47122F3J4_NE	Acenaphthene Phenanthrene Fluorene Low weight PAHs Dibenzofuran	High molecular weight PAH Fluoranthene PCBs
Slip 36 and north past Terminal 46 Area 3	47122F3J3_SE	N/A	Acenaphthene Bis(2-ethyhexyl) phthalate PCBs Dibenzofuran Phenathrene Fluorene

Source: Department of Ecology 2022

Stormwater. Stormwater within the Base Seattle boundary is captured in catch basins. Individual catch basins capture and direct flows from impervious surfaces, such as parking lots and pier decking Some of the catch basins provide filtration prior to discharging to either Elliott Bay, the Duwamish Waterway, or Slip 36. For a complete description of the existing stormwater system, see Section 3.10, *Utilities and Public Services.* Surface discharge to adjacent surface waters via the stormwater system constitutes potential point sources of pollution from surface runoff.

No National Pollutant Discharge Elimination System (NPDES)/ Municipal Separate Storm Sewer System (MS4) permit is required because the facility meets requirements to operate under a USEPA no exposure exclusion by implementing BMPs and processes aimed at eliminating stormwater discharges. To meet this standard the Coast Guard maintains and implements a SWPPP. The Coast Guard also maintains and implements a Spill Prevention Control and Countermeasure (SPCC) Plan that describes the facility and lists discharge prevention provisions (i.e., inspections, loading operations, and discharge response) (Coast Guard 2018). Implementation of the SPCC Plan limits the potential for accidental spills to the maximum extent practicable and ensures rapid and coordinated responses should a spill occur.

The surrounding potential acquisition properties (i.e., Terminal 46 and Terminal 30) are almost entirely paved with asphalt, except for the Jack Perry Memorial Park and the BNSF Railway properties. Runoff from these properties is managed by stormwater systems operated and maintained by the City and/or Port. Due to previous stormwater pollution violations, Terminal 46 is currently subject to a consent decree between the Port of Seattle and the Puget Soundkeeper Alliance for the cleanup and maintenance of Terminal 46 following the vacation of the facility by Total Terminals International, LLC, the site's former tenant. The consent decree requires the Port, in the absence of Total Terminals International, LLC, to periodically conduct cleanups of the surface and stormwater system for the term of the consent decree. The consent decree is set to expire in Fall 2022 (Port of Seattle and Puget Soundkeeper 2019).

Groundwater

Hydrogeologic Setting. Average depth to groundwater at Base Seattle ranges from 8 to 14 feet (Pacific Groundwater Group 2016). Recharge to the water table aquifer originates as precipitation in uplands and unpaved areas off-site. Given the proximity of Base Seattle and surrounding Terminals 46 and 30 to the Elliott Bay shoreline, there is subsurface mixing between fresh and saline waters that ebb and flow with the tides. Paving and impervious surfaces at Base Seattle prevent any substantial groundwater recharge within the boundary of the Base.

Groundwater Quality. The Department of Ecology tracks cleanup sites that have confirmed or suspected contamination and could potentially harm people or the environment, pursuant to the State Model Toxics Control Act. Department of Ecology-listed sites with groundwater contamination within the proposed Base Seattle boundary or on adjacent Terminals 46 and 30 are listed in Table 3.3-2 (also see Appendix O). Of the three recorded groundwater contamination sites within or in proximity to the Base Seattle boundary, two are classified as "cleanup started" by the Department of Ecology. These are the Federal Warehouse Site (former location of General Service Administration warehouse between Building 7 and Building 2 Annex) and the Flint Ink site (vicinity of MITAGS). The GATX Tank Storage Terminal is also classified as "cleanup started," but it is being actively monitored.

Environmental evaluations have been conducted on Terminal 46 for the removal of underground storage tanks (UST) that held petroleum products. The Port of Seattle's initial investigation found that groundwater onsite contained benzene, diesel, gasoline, and other petroleum products below cleanup levels (Department of Ecology 2011).

Environmental evaluations have also been conducted at Terminal 30 and cleanup related to the site's prior use as a bulk fuel terminal. Primary contaminants identified in groundwater from that property include total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs) including benzene, and PAHs. The Port of Seattle has constructed an Air Sparge/Soil Vapor Extraction system as a cleanup remedy to reduce the total level of contamination of groundwater at Terminal 30. Ongoing monitoring of groundwater wells indicate that concentrations of groundwater contaminants have decreased since the system became operational and vapor extraction cleanup activities began (Port of Seattle 2021).

Floodplains

Base Seattle and the adjacent waterfront facilities are subject to a substantial range of tides. The tide fluctuates approximately 8.5 feet between mean high water (MHW) and mean low water (MLW) and up to 11.4 feet between mean higher high water (MHHW) and MLLW. The Federal Emergency Management Agency (FEMA) has designated a "Zone VE (Elevation 14 Feet)" for the in-water portion of Base Seattle. This flood zone designates the area as a coastal flood zone that has a velocity hazard (i.e., wave action) but does not extend inland past the existing shoreline at Base Seattle and the surrounding properties. The upland portion of Base Seattle and surrounding properties including existing Base Seattle buildings, the MITAGS, the Belknap, and BNSF Railway properties, and Jack Perry Memorial Park are all located outside the FEMA 1-percent Flood Hazard Zone, or the 100-year floodplain, and are classified by FEMA as "Zone X." Additionally, Terminals 30 and 46 are adjacent to, but outside of, any 100-year floodplain. Tsunami flooding could occur at Base Seattle in the event of a high magnitude earthquake within the region (refer to Section 3.2, *Geologic Resources*).

Figure 3.3-1 Stormwater Map

Existing Facilities

1. Base Admin
2. Exchange
3. Industrial Shops and Gym
4. CG Sector Puget Sound
5. Museum
6. UPH / Galley
7. Warehouse
10. ANT-Seattle Shops
12. Magazine
14. Hazmat Pharmacy
19. Security Gate / Access Gate
20. Secondary Access Point

Stormwater Map

FIGURE
3.3-1

Table 3.3-2 Department of Ecology Contaminated Groundwater Sites in and around Base Seattle

Ecology Contamination Site Name	Location	Metals	PCBs	Non-Halogenated Solvents	PAH	Benzene	Diesel	Gasoline	Petroleum - Other	Petroleum-Unspecified	Pesticides	Phenolic Compounds	Status
Federal Warehouse	Base Seattle	S	S	S	S	C	C	C	C		S		Cleanup Started
Flint Ink Building	Vicinity of MITAGS	-	-	-	-	-	-	-	C		-		Cleanup Complete
GATX Tank Storage Terminal	Vicinity of MITAGS	C	-	C	C	-	-	-	-	C	-		Cleanup Started
Terminal 46	Terminal 46	-	-	-	-	B	B	B	B	-	-	B	Cleanup Started
Terminal 30	Terminal 30				C	C		C		C			Cleanup started

Note: S – Suspected, C – Confirmed Above Cleanup Levels, B – Below Cleanup Levels
Source: Department of Ecology 2021

3.3.4 Environmental Consequences of the Action Alternatives

Impacts on water resources associated with the three principal components that would be common to all three action alternatives are described here. Sections 3.3.4.1 through 3.3.4.3 provide a description of impacts that are unique to each action alternative and divided between upland and in-water locations. Base Seattle and any land acquired under each alternative is considered a potential source of contaminants to surface waters where contaminants could flow via stormwater (i.e., Elliott Bay and the Duwamish River) and to groundwater at the site. In-water and upland work locations could result in impacts to surface waters through spills directly to Elliott Bay and the Duwamish River. Upland work locations could result in impacts to groundwater through spills or increased runoff directly to the subsurface during periods where currently covered soils are exposed when impervious surfaces are temporarily removed.

Land Acquisition

Based on the purely transactional nature of land acquisition, this component of the proposed modernization would have no potential to directly impact water resources. There would be no change in use of surface waters or groundwater or alteration of discharges from the land to surface waters or percolation to groundwater such that the quantity or quality of these water resources would be altered. Further, the land acquisition of neighboring properties would not directly include development within a floodplain.

Construction

Upland Construction. Under any of the three action alternatives, staging and construction support activities would have the potential to result in short-term, adverse impacts on surface water and groundwater quality. Throughout the duration of construction, hazardous materials would be stored and used within Base Seattle and any acquired property. The storage, maintenance, and fueling of construction equipment could result in the accidental release of petroleum, oils, and lubricants (POL), or other hazardous materials, that could runoff to surface waters or percolate to groundwater. Hazardous

wastes would also be generated throughout the duration of construction activities (e.g., used oil and other construction materials (see Section 3.11, *Hazardous Materials and Wastes*). An SPCC Plan would be required for individual construction projects as appropriate to establish procedures to avoid or respond to any accidental releases of hazardous materials or wastes during construction (see Appendix E). The procedures in the SPCC Plan would ensure regular inspection of vehicles and equipment, designation of equipment fueling locations, and require spills occurring on land would be cleaned up immediately with no chance of migration to adjacent waterways or percolate to groundwater.

As described further in Section 3.11, *Hazardous Materials and Wastes*, demolition activities could disturb hazardous building materials (e.g., asbestos, lead-based paint [LBP]). If handled or stored improperly, such materials could be released into the surrounding waters and have a direct, adverse impact on water quality. All hazardous materials and wastes at Base Seattle would be managed under the Hazardous Waste Management Model (COMDTINST M16478.1B; see Appendix E). The Coast Guard would be required to comply with all federal, state, and local laws and regulations regarding the handling, temporary storage, and disposal of hazardous building materials.

Ground disturbing activities required under any of the alternatives—including excavation, grading, trenching, and installation of stone columns—could result in exposure of soils that were previously covered by impervious surfaces as well as potentially contaminated soils. It is assumed that any necessary CERCLA removal action would occur prior to installation of stone columns. Ground disturbing activities under the three action alternatives would be similar in type while the scale would slightly in proportion to the change in size of Base Seattle. Temporary removal of impervious surfaces would permit increased percolation of surface flows directly into the groundwater. This would potentially include any contaminants that surface flows collect as they move across the Base Seattle surface. Auguring for installation of stone columns would expose groundwater to direct runoff that could carry contaminants for the duration that individual locations are exposed before being recovered by paving. All ground stabilization options (i.e., stone columns or grouting) would alter or solidify in the subsurface and potentially alter the flow or quality of the groundwater at Base Seattle.

If contaminated soils are encountered during ground disturbing activities, they would be tested and managed in accordance with applicable laws and regulations including, if required, disposal within a Class I hazardous waste landfill. The Coast Guard would ensure the implementation of dust abatement ECMs to avoid loose soil leaving the site and/or entering any waterways (see Section 3.5, *Air Quality*). Appendix E provides details on these ECMs. Construction activities that disturb one or more acres would be required to prepare and implement a SWPPP. As part of compliance with this SWPPP, construction sites would be required to implement sediment, erosion, and pollution prevention control measures. The plan would also include ECMs for minimizing and containing dust, debris, fuels, or other potentially hazardous materials from entering adjacent surface waters during construction. The Coast Guard would work closely with the Port to ensure its stormwater management systems are separated from Port activities and stormwater management requirements.

Overall, upland construction would result in minor impacts on water quality (both surface water and groundwater) in the short-term. Surface water impacts would be indirectly caused by ground-disturbing activities that would increase potential runoff to surface waters and potential for spills that could wash pollutants to surface waters via stormwater or uncontrolled movement of fugitive dust. Direct groundwater impacts would be caused by the combination of increased potential for spills, and temporarily increased potential for contaminants percolating to groundwater in areas where impervious surfaces are temporarily removed during construction activities. Additional groundwater impacts would

result from ground-stabilizing activities such as installation of stone columns, which could alter groundwater flow, or injection of stabilizing grouting, which could alter groundwater flow or chemistry. These impact-driving issues would be controlled, to the extent practicable, through the implementation of the various measures as listed in Appendix E to prevent exceedances of water quality standards, ensuring that impacts to surface water or groundwater quality from upland construction would be minor.

In-Water Construction. All three action alternatives include in-water construction activities to rehabilitate portions of Terminal 46. Because construction details for this proposed work is not known at this time (i.e., number and type of piles to support decking, duration of construction activities, installation of sheet piles to stabilize shoreline), likely impacts on water resources cannot be fully predicted at this time. Rehabilitation of Areas 1 and 3 of Terminal 46 would include the removal of creosote-coated timber piles, which would be replaced with either concrete or composite piles. Creosote is considered a contaminant that adversely affects water quality and removal of creosote-treated timber piles is typically considered a beneficial effect on water quality.

Pile installation at Terminal 46 would potentially result in localized suspension of bottom sediments, which may adversely affect water quality in the East Waterway or Elliott Bay by temporarily increasing turbidity and decreasing dissolved oxygen, an ongoing 303(d) water quality issue (see Table 3.3-1). Increased turbidity can affect water quality because it reduces the ability for light to enter the water. Light contributes to the health of a water body by driving natural processes such as photosynthesis that releases oxygen into the water and the atmosphere. As the sediment in a turbidity plume settles back to the bottom, it may also cover bottom-dwelling species, which may leave the area if they are mobile, or may be cut off from access to light if they are immobile/photosynthetic. The natural decay of organic matter in marine sediment consumes dissolved oxygen in the water may be accelerated when disturbed, which reduces oxygen's availability for use by organisms such as fish, plankton, and plants. Reduced dissolved oxygen associated with reduced underwater light would be short-term and restricted geographically from the Base Seattle waterfront to the point where the turbidity plume would re-settle to the bottom. The magnitude of this impact would be short term and consistent with other activities that regularly occur in the Puget Sound.

Disturbance of the bottom sediments during rehabilitation of Terminal 46 may also release hazardous chemicals or other contaminants, including listed 303(d) contaminants, that settled previously and were trapped within the local sediments (see Table 3.3-1), including areas of contamination that may be in or in proximity to HISS OU 10. Generally, the size and shape of turbidity plumes that would be generated are difficult to quantify because of variability in naturally occurring conditions, such as wind and currents, type of piles that would be installed, and type of pile driving equipment used. It is not possible at present to estimate the scale and duration of the adverse water quality impacts resulting from in-water pile installation work at Terminal 46. This work is however common and consistent with other activities that regularly occur in Puget Sound. As described in Section 2.4, for purposes of this analysis, it is assumed that this work would not require removal of contaminated sediments under a separate CERCLA action directed by USEPA prior to implementation. Therefore, adverse water quality impacts associated with the Action would be minor.

Long-term Operations

Stormwater runoff would continue to be generated from rain events that result in sheetflow over the impervious surfaces, including paved roadways, parking lots, and building rooftops. Stormwater runoff can collect pollutants that degrade the quality of adjacent waterways. Base Seattle's proposed

modernization would include improvement, upgrade, and/or replacement of all existing stormwater systems. This would result in a modernized system that is fully compliant with current stormwater management regulations and can better limit stormwater flows into Elliott Bay via point sources. As described in Section 3.3.3, *Affected Environment*, Base Seattle currently meets USEPA's no exposure exclusion and therefore does not require a NPDES/MS4 permit.

Modernization activities would not result in an increase of impervious surfaces within Base Seattle or the adjacent acquired properties because nearly all lands are currently covered with paving or other impervious surfaces. Operational activities would remain consistent with the types of activities currently conducted at Base Seattle, with some increase associated with increasing operational support activities (i.e., vessel maintenance). Improvement, upgrade, or replacement of aging infrastructure would reduce the potential for leaks or failures of the existing stormwater management system. Although design details and updated stormwater management plans have not yet been completed, the Coast Guard would work with the Port and City to ensure separate stormwater flows and management needs are met. The Coast Guard anticipates that the Base would continue to meet USEPA's no exposure exclusion.[3]

Following construction, current types of Coast Guard operations would continue unchanged at Base Seattle, including implementation of SPCC measures, but would increase in area and frequency to accommodate increased vessel maintenance and sustainment activities across additional berths. These increased activities would result in increased risks for spill and leaks of petroleum or other hazardous materials directly to waterways, transported indirectly via stormwater, or absorbed into the local groundwater. There would also be an increase in total personnel, which would result in an increased number of vehicles at the Base, as well as an increased number of vehicles and equipment used for facility operations. These vehicles could cause accidental releases of petroleum or other hazardous materials that could be transported to adjacent waterbodies via stormwater or absorbed into the groundwater. Spills and other releases would be limited by proper maintenance, inspection, and operation of government owned equipment, as well as implementation of the existing SPCC Plan. In the event of an accidental release, cleanup would take place, booms and other spill containment equipment kept on hand would be deployed immediately, and the source of the release would be determined and secured.

Proposed improvements under any of the three action alternatives would be implemented outside of the boundaries of the 100-year floodplain and while additional personnel would be stationed at Base Seattle, none would be located in any designated floodplain. As described previously, the upland portion of the Base is adjacent to Zone VE, a coastal flood zone containing additional hazards associated with storm waves. Because no increase to impervious surfaces is proposed and redevelopment would include use of drainage control measures (see Appendix E), no increase in sheet runoff or flooding is anticipated. The final design of the proposed improvements would also account for long-term sea level rise projections in the region by including the use of tsunami-resilient first floors (i.e., elevated or unoccupied) in proposed new buildings (see Appendix E).

[3] Under the conditional no-exposure exclusion (40 CFR §122.26[g]), operators of industrial facilities subject to stormwater regulations have the opportunity to certify to a condition of "no exposure" if their industrial materials and operations are not exposed to stormwater.

3.3.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Direct and indirect, adverse impacts on water quality during upland construction activities would be similar to those described above. Thus, impacts are expected to be short-term and minor.

Pursuant to EO 11988, Alternative 1 would not: (1) have a high probability of loss of human life; (2) have substantial, encroachment-associated costs or damage; or (3) cause adverse impacts on natural and beneficial floodplain values. Therefore, no impacts on floodplains would occur.

Overall, impacts on water resources resulting from implementation of Alternative 1 are expected to be short-term and confined to construction activities as there would be no permanent change to existing over-water coverage and associated shading effects (e.g., reduced light). These direct impacts are expected to be adverse during construction resulting from upland and underwater sediment disturbance and increased runoff into surface waters. Implementation of a SWPPP (see Appendix E) would also ensure that indirect sediment and contaminant input to surface waters from upland areas would be limited to the extent practicable. Implementation of the SPCC would ensure that spills are cleaned up and spilled pollutants wound be prevented from entering surface water or groundwater to the extent practicable. Because the structural design of the wharf area at the southern end of Terminal 46 adjacent to Slip 36 is not yet known, the scale of effects related to water quality from disturbed underwater contaminated sediments cannot be fully predicted. It is assumed that exceedances of water quality standards, including identified 303(d) impairments, may occur. Measurable impacts on pollutant concentrations would not exceed applicable standards, regulations, and guidelines. If any contamination is found that warrants a removal action, it would occur prior to Alternative 1 implementation.

Overall, Alternative 1 work may result in short-term, indirect, adverse impacts on surface water quality by disturbing contaminated underwater sediments or decreasing dissolved oxygen may contribute a minor amount to ongoing 303(d) impairments of surface waters under the CWA. Given that the work being completed would most likely occur after any necessary CERCLA action is completed (see Chapter 4, *Cumulative Effects*), the short-term impacts on surface water quality from in-water work are considered not significant. Therefore, pursuant to NEPA and the CWA, no significant impacts would occur under Alternative 1.

3.3.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

Short-term, direct and indirect, adverse Impacts from in-water construction to surface waters under Alternative 2 would be the same as under Alternative 1. With regard to in-water construction activities at Terminal 30, the configuration, design, and extent of the construction, and potential impacts to water resources to create Piers 35E/F are unknown at this time but are expected to be implemented, in part, under a future CERCLA action (see Section 2.4 and Chapter 4, *Cumulative Effects*).

Similar to Alternative 1, Alternative 2 would not: (1) have a high probability of loss of human life; (2) have substantial, encroachment-associated costs or damage; or (3) cause adverse impacts on natural and beneficial floodplain values. Therefore, no impacts on floodplains would occur.

Overall, Alternative 2 work may result in short-term, indirect, adverse impacts on surface water quality by disturbing contaminated underwater sediments or decreasing dissolved oxygen may contribute a minor amount to ongoing 303(d) impairments of surface waters under the CWA. Given that the work being completed would most likely occur after any necessary CERCLA action is completed (see Chapter 4, *Cumulative Effects*), the short-term impacts on surface water quality from in-water work are

considered not significant. Therefore, pursuant to NEPA and the CWA, no significant impacts would occur under Alternative 2.

3.3.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

Short-term, direct and indirect, adverse impacts on water quality during upland construction activities would be identical to those described above for Alternative 2 and would only vary by total area of ground disturbance.

In-water construction under Alternative 3 would the same as under Alternatives 1 and 2, and short-term impacts to surface waters are expected to be same as those Alternatives. With regard to in-water construction activities at Terminal 30, the configuration, design, and extent of the construction, and potential impacts to water resources, to create Pier 35E are unknown at this time but are expected to be implemented, in part,under a future CERCLA action (see Section 2.4 and Chapter 4, *Cumulative Effects*).

Similar to Alternatives 1 and 2, Alternative 3 would not: (1) have a high probability of loss of human life; (2) have substantial, encroachment-associated costs or damage; or (3) cause adverse impacts on natural and beneficial floodplain values. Therefore, no impacts on floodplains would occur.

Overall, Alternative 3 work may result in short-term, indirect, adverse impacts on surface water quality by disturbing contaminated underwater sediments or decreasing dissolved oxygen may contribute a minor amount to ongoing 303(d) impairments of surface waters under the CWA. Given that the work being completed would most likely occur after any necessary CERCLA action is completed (see Chapter 4, *Cumulative Effects*), the short-term impacts on surface water quality from in-water work are considered not significant. Therefore, pursuant to NEPA and the CWA, no significant impacts would occur under Alternative 3.

3.3.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, there would be no changes related to land acquisition, construction, demolition, renovation, or long-term operations at Base Seattle. As such, there would be no displacement of functions or associated changes in stormwater discharge or water quality on Terminal 46, Terminal 30, or any of the other proposed acquired properties. Stormwater management commitments at the Port properties would remain unchanged. Nevertheless, it is expected that water quality would continue to improve at the Port following the continuing remediation efforts (see Section 3.11, *Hazardous Materials and Wastes*). There would be no temporary construction-related activities associated with Base Seattle's modernization. As such, there would be no construction-related exposure of underlying soils, potential for polluted stormwater runoff, or accidental spills associated with the proposed Base Seattle modernization.

Under the No-Action Alternative, stormwater management would be addressed similar to existing conditions. The existing stormwater system would not be improved and would require maintenance and repair on a regular basis, given the system's age. Without the proposed repair, upgrades, or replacement activities, the ongoing potential for leaks and/or failures of the existing stormwater management system would remain. Accidental spills would be handled in a similar manner to existing conditions. Accidental releases of petroleum and other related products from vehicles and equipment would be limited by proper maintenance, inspection, and operation, as well as implementation of the SWPPP and/or SPCC Plan. Accidental releases would be reported according to existing requirements. Therefore, implementation of the No-Action Alternative would have no change to operational impacts on surface water.

Therefore, implementation of the No-Action Alternative would result in long-term adverse impacts on surface water quality from accidental spills. With regular maintenance and repair of the existing stormwater system, as needed, no significant impacts would occur.

3.3.6 Comparison of Alternatives

Alternative 1 would result in the greatest area of temporary upland disturbance and, therefore, the greatest potential for construction-related impacts on surface water quality resulting from disturbance of the land surface due to potential spills, and escape of fugitive dust or runoff of newly exposed contaminated sediments to adjacent surface waters The difference in effects on surface water quality resulting from upland construction across the alternatives would be very small and would not have a measurable change in surface water quality through the implementation of ECMs.

Similar to surface water, Alternative 1 and its greatest area of upland ground disturbance would have the greatest potential impact on groundwater quality at Base Seattle. Alternative 1 would likely expose the largest area of soils previously covered by impervious surfaces and temporarily uncovered during construction activities which would allow increased groundwater percolation, and potential for quality impacts, during upland construction. Similar to surface water quality, the difference would be relatively small and would not have a measurable change in groundwater quality through the implementation of ECMs.

In-water work across all three action alternatives would be the same at Terminal 46 and there would be no difference in potential impacts to water resources between the action alternative. The three action alternatives would have the potential for adverse and beneficial impacts on surface water resources of Elliott Bay that would not occur under the No-Action Alternative. Beneficial impacts would result from the removal of creosote-treated timber piles under Area 3 of Terminal 46. Adverse impacts would result from the potential for spills directly to Elliott Bay during in-water construction work or indirectly from short-term disturbance of bottom sediments that would abate as sediment falls out of suspension.

Therefore, of the three action alternatives and the No-Action Alternative, Alternative 2 has the greatest potential to result in short-term, adverse impacts that would most likely not exceed water quality standards pursuant to the CWA.

All of the action alternatives would comply with EO 11988 regarding development within and conservation of floodplains, and no impacts on floodplains would occur. The No-Action Alternative would also result in no impacts on floodplains because no activities or development within floodplains would occur.

Table 3.3-3 Comparison of Alternatives for Water Resources

Comparison of Alternatives for Water Resources Impacts	
Alternative 1	No significant impact
Alternative 2	No significant impact
Alternative 3	No significant impact
No-Action Alternative	No impacts.

3.3.7 Environmental Conservation Measures

Short-term, potentially significant impacts on water resources are expected to occur under each of the action alternatives. The Proposed Action would include implementation of measures (e.g.,

implementation of a SWPPP) that would serve to avoid or minimize adverse temporary or operational impacts to the extent practicable. For further details regarding these measures including how they would be implemented, see Appendix E.

3.4 Transportation

Summary of Findings

The Proposed Action, Action Alternatives, and No-Action Alternative would not result in increases in traffic volumes or delays to levels that impair a roadway's functionality, exceedance of a roadway's handling capacity, or substantial and permanent changes to roadway accessibility. No significant impacts on transportation are expected to occur under any of the Action Alternatives and the No-Action Alternative.

3.4.1 Background

Traffic refers to the movement of vehicles and other means of transportation along and adjacent to roadways. Transportation facilities that serve Base Seattle and the surrounding areas include roadways, public transit, rail, pedestrian and bicycle networks, and marine-related systems (e.g., Washington State Ferries). This transportation analysis also includes discussion of parking at Base Seattle.

3.4.2 Approach to Analysis

Roadway transportation conditions are evaluated using several factors, including number of lanes, width of lanes, roadway gradient, obstructions, vehicle volumes, and other physical characteristics of the roadway network. Other variables that are commonly evaluated to determine a roadway's operational effectiveness include delay, the average duration a vehicle is stopped; queuing, the number of vehicles stopped on a roadway; and level of service, a measure of the efficiency of a roadway or intersection based on performance measures. Traffic delays, queuing, and level of service are indicators of a roadway's functionality. They are not indicators of the level of safety of a roadway but do indicate a level of potential annoyance for roadway users. Accordingly, high delay/queuing rates and poor level of service indicate a greater potential for roadway congestion or delayed commute times. For the purposes of this analysis, Annual Average Daily Traffic (AADT) counts were used to analyze the transportation conditions near Base Seattle. Delay, queueing, and level of service data for transportation facilities were not available.

AADT is a measure of the average number of vehicles that travel on a section of roadway in a given day. WSDOT gathers AADT data through a combination of Permanent Traffic Recorders that collect data constantly throughout the year; short duration counts derived through the application of seasonal, day of week, and axle correction factors; and special purpose counts conducted to obtain traffic information for specific projects (WSDOT 2019). The Federal Highway Administration (FHWA) regulates highways and highway operations. Highway and street operations in Seattle are also regulated and implemented by WSDOT and SDOT. The Puget Sound Regional Council is responsible for transportation planning in Seattle and the surrounding region. The Coast Guard is responsible for managing streets and pavement on Base Seattle. Regulatory policies and procedures related to transportation and roadways are included in Appendix F, *Summary of Regulatory Requirements*.

Local and regional transportation facilities considered in this analysis include roadways, freight routes, pedestrian and bicycle networks, and public transit. Base Seattle transportation facilities considered in this analysis include roadways, pedestrian and bicycle networks, and parking. The transportation study area consists of Base Seattle and extends south along Alaskan Way South/East Marginal Way South to the Terminal 30 entrance, north to Pioneer Square (Yesler Way), and east to 4th Avenue. This analysis addresses select roads within Pioneer Square (i.e., Yesler Way, 1st Avenue South, 4th Avenue South, South Jackson Street, and Alaskan Way South) and within the Seattle Stadium District (i.e., South Jackson Street, South Atlantic Street/Edgar Martinez Drive, Alaskan Way South, 1st Avenue South, and 4th Avenue South). The transportation study area also includes parts of major throughfares, such as Interstate (I-) 5, State Route (SR) 99, and I-90, that support Base Seattle-related traffic.

Impacts were estimated by evaluating how the proposed Base Seattle modernization program and anticipated increases in personnel could affect traffic volume on transportation facilities within the transportation study area. Anticipated increases in personnel traffic volumes were estimated using the conceptual construction and personnel sequence shown in Figure 2.5-1. This impact analysis considers the capacity of the transportation facilities within the transportation study area, and the compatibility of the proposed modernization program with existing conditions and estimated future traffic volumes. Adverse transportation impacts could occur if the proposed Base Seattle modernization program resulted in increased traffic volumes or delays to levels that impair a roadway's functionality; exceedance of a roadway's handling capacity; or substantial and permanent changes to roadway accessibility.

The proposed Base Seattle modernization program would include land-side construction activities within the footprint of Base Seattle and the proposed acquired properties. There are no rail lines within Base Seattle; therefore, impacts on freight and passenger rail services are not anticipated, and rail transportation facilities are not discussed further.

In-water construction would consist of dredging, installation of piles, and sediment stabilization within and directly adjacent to Slip 36, the southern portion of Terminal 46, and Pier 35. Construction would not occur in the primary navigable channel of the Duwamish Waterway or Elliott Bay. In addition, Coast Guard cutters would be moored outside of the navigable channel and would not affect vessel transit patterns or the functionality of the channel. Therefore, impacts on in-water transit routes used for freight vessel traffic in the Duwamish Waterway and Elliott Bay are not anticipated, and in-water transit routes and vessel traffic are not discussed further.

In this PEIS, impacts from projected increases in traffic levels are assessed using the best available quantitative data derived from existing AADT and traffic data provided by WSDOT, SDOT, and the Coast Guard; construction assumptions; and personnel arrival estimates. Impacts were assessed qualitatively where quantitative data could not be used or was not available. The analysis of construction-related transportation impacts considered activities that would result in one-time physical changes to Base Seattle and/or acquired properties, as generated by various construction equipment (i.e., backhoes, dozers, cranes) or construction activities. Long-term operational transportation impacts considered only ongoing Coast Guard operations at Base Seattle and the anticipated commuting activity. For the purposes of this analysis, it was assumed Coast Guard personnel maintain a typical work schedule (i.e., Monday through Friday, excluding federal holidays).

3.4.3 Affected Environment

Regional Transportation

Base Seattle is within the Seattle metropolitan area, which is made up of the most diverse and concentrated collection of transportation facilities and resources in Washington and where heavy traffic is known to be an issue. Downtown Seattle also has the highest concentration of employers and entertainment venues in the State, including two major professional sports stadiums: Lumen Field and T-Mobile Park. The Base is bordered by major traffic thoroughfares to the east, Port of Seattle cargo shipping terminals to the north (Terminal 46) and south (Terminal 30), and the Duwamish Waterway to the west. The transportation study area consists of Base Seattle and extends south along Alaskan Way South/East Marginal Way South to the Terminal 30 entrance, north to Pioneer Square (Yesler Way), and east to 4th Avenue. The transportation study area also includes major thoroughfares such as I-5, SR 99, and I-90.

Surface Transportation. Base Seattle is served by the following network of local and regional roadways and major traffic thoroughfares:

- I-90, connecting Base-oriented traffic to I-5, with eastbound and westbound ramps at Edgar Martinez Drive and 4th Avenue South
- SR 99, which is a tolled tunnel under downtown Seattle to the north and a limited-access facility to the immediate south, with exit and entrance ramps at the intersections of South Royal Brougham Way/South Dearborn Street and Alaskan Way South
- Alaskan Way South/East Marginal Way South, which runs along the Seattle waterfront immediately east of Base Seattle and provides access to the Base Seattle Main Entry Control Point (ECP), Colman Dock Ferry Terminal, and Terminals 30 and 46
- South Atlantic Street/Edgar Martinez Drive, which connects Alaskan Way South and SR 99 to I-90 at 4th Avenue South

The intersection of Alaskan Way South with South Atlantic Street handles nearly all Base Seattle commuter traffic. In addition, its west leg serves the Port of Seattle's Terminal 46 facility, where freight containers access the terminal by truck. In general, once Base Seattle commuter trips oriented to I-5 and I-90 pass 4th Avenue South (east of Base Seattle), they no longer affect local streets near the Base. The estimated 2019 AADT on roadway segments near Base Seattle is indicated in Figure 3.4-1. Roadway capacity data are included in Table 3.4-1. As of 2019, there are no roadways within the study area for which traffic exceeds the roadway's capacity.

Table 3.4-1 2019 AADT for Local and Regional Roadways

Facility	Cross Section	2019 AADT[1]	Daily Capacity[2]
I-90 Eastbound On Ramp	2-Lane Undivided Freeway	39,400	23,150 to 53,700
I-90 Westbound Off-Ramp at Edgar Martinez Drive	2-Lane Undivided Freeway	25,000[3]	23,150 to 53,700
SR 99 Tunnel	4-Lane Divided Freeway	69,500	46,300 to 107,400
SR 99 Between Southbound On & Off Ramps	2-Lane Undivided Freeway	9,100	23,300 to 53,700
SR 99 Southbound On Ramp	2-Lane Undivided Freeway	11,100	8,900 to 18,300
SR 99 Southbound Off Ramp	2-Lane Undivided Freeway	9,200	8,900 to 18,300
SR 99 Northbound Off Ramp	2-Lane Undivided Freeway	10,500	8,900 to 18,300
Alaskan Way South	2-Lane Undivided Street	9,100	8,900 to 18,300
South Atlantic Street/Edgar Martinez Drive	4-Lane Undivided Street	29,000	18,600 to 36,800
South Jackson Street	4-Lane Undivided Street	17,300	18,600 to 36,800

1st Avenue South	4-Lane Undivided Street	24,000	18,600 to 36,800
4th Avenue South	4-Lane Undivided Street	33,900	18,600 to 36,800

References: SDOT 2020, WSDOT 2020, TRB 2016, Spack 2017
Notes:
[1]All volumes represent a combined total for both directions unless the volume is on a ramp, as indicated.
[2]Roadway capacities estimated using the Transportation Research Board's *Highway Capacity Manual*.
[3]Represents 2020 data, as 2019 AADT data for this facility were not available.

Personnel traveling from areas north of Seattle to Base Seattle have an average travel time of up to 20 minutes (15.2 miles from Lynwood to Seattle via I-5). Personnel traveling from areas south of Seattle have an average travel time that varies from 19 minutes (13 miles from SeaTac Airport to Seattle via I-5) to 22 minutes (13.5 miles from Renton to Seattle via I-405 and I-5). Personnel living east of Seattle have an average travel time between 12 and 17 minutes from Bellevue to Seattle (10.2 to 10.6 miles) via I-405, SR 520, I-90, and I-5 (WSDOT 2021b). Traveling either north or south from outside of King County increases travel times significantly, with a 69-minute morning travel time from Federal Way and an 89-minute morning travel time from Everett. To reduce time spent commuting, some personnel arrive at Base Seattle very early in the morning before heavy traffic.

Alaskan Way South, along Base Seattle's eastern boundary, is a local surface arterial that provides access along the Seattle waterfront and serves as the primary transportation corridor for the Port of Seattle. The road connects with South Atlantic Street at the northeast corner of Base Seattle and both streets connect local traffic to major roadways such as I-5, I-90, and SR 99. A large portion of traffic along Alaskan Way South in the vicinity of Base Seattle is composed of trucks transporting containers between I-5, I-90, and the Terminal 46 and Terminal 30 container yards. Traffic approaching and leaving Colman Dock Ferry Terminal, north of Terminal 46, also use Alaskan Way South. Because ferry traffic primarily occurs at the ferry terminal north of Terminal 46, and the entrance and exit ramps for I-5, I-90, and SR 99 are south of Terminal 46, truck traffic is largely separated from ferry traffic on Alaskan Way South. During periods of peak ferry-related congestion, ferry traffic can become intermixed with truck traffic. This conflict is aggravated periodically by heavy traffic from events at Lumen Field and T-Mobile Park in the Stadium District.

Lumen Field is two blocks from Base Seattle on the northeast corner of 1st Avenue South and South Royal Brougham Way and hosts up to 10 professional football games per year between August and January, 20 professional soccer games per year between March and October, and other events (e.g., concerts), generally during evenings and on weekends (Alliance for Pioneer Square 2021). Event traffic related to spectators arriving at the Stadium District for evening games at Lumen Field typically occurs between 5 p.m. and 8 p.m. Because events at Lumen Field generally occur outside of normal working hours, Lumen Field does not typically generate large event traffic that overlaps with Base Seattle commuter traffic, as peak commuter departure times occur between 1:30 and 3:00 p.m. (Lumen Field 2022, Coast Guard 2021). In addition, Base Seattle traffic volumes are reduced substantially on weekends, and therefore, do not noticeably affect weekend event-related traffic.

T-Mobile Park is one block from Base Seattle on the southeast corner of 1st Avenue South and South Royal Brougham Way and hosts over 80 baseball games per year along with other events (e.g., concerts, school graduations), generally in the afternoons and evenings (Alliance for Pioneer Square 2021). These include 50 to 60 weeknight baseball games between March and October. Spectators for weeknight games typically travel to the park prior to the start of a game, adding additional traffic on area roadways during the evening peak traffic period. Specific data on attendance trends for T-Mobile Park were not available; however, it is reasonable to assume most attendees travel to games with two or more people

Figure 3.4-1 2019 AADT for Roadways near Base Seattle

2019 AADT for Roadways near Base Seattle

FIGURE
3.4-1

in a single vehicle or may use transit, as opposed to traveling alone in a personal vehicle. Despite rideshare and transit use, and most attendees arriving after gates initially open, baseball games produce higher-than-usual vehicular traffic on local roadways and very high pedestrian traffic at primary intersections. Between 2011 and 2021 (excluding 2020), attendance for regular season Mariners home games averaged approximately 26,500 spectators per game (ESPN 2021). Pedestrian traffic prior to home games is highest at the home plate gate, at the northeast corner of the Edgar Martinez Drive and 1st Avenue South intersection. Spectator entrances open as early as two hours prior to home games. Spectators may arrive to the area earlier and transit on foot through the Stadium District, or Pioneer Square to the north of the Stadium District, prior to entering T-Mobile Park. At the time of this analysis, detailed vehicle and pedestrian data for event-related traffic were not available.

T-Mobile Park offers event parking in three parking garages including Mariners Garage on Edgar Martinez Drive (approximately 2,000 parking spots), Lumen Field Garage on South Royal Brougham Way (approximately 2,000 parking spots), and Union Station Garage on 4th Avenue South (approximately 1,000 parking spots), offering a total of more than 5,000 parking spaces. Lumen Field offers on-site parking for more than 3,000 total vehicles in two parking garages (i.e., the Lumen Field Parking Garage [approximately 2,000 spots] and the Union Station Parking Garage [approximately 1,000 spots]), plus approximately 580 spots in the Lumen Field North Lot, a surface parking lot just north of the stadium. The Lumen Field Garage is open only for events at Lumen Field and T-Mobile Park. The Lumen Field North Lot is open only for events at Lumen Field. The Mariners Garage is open only for events at T-Mobile Park. Privately operated lots in the area provide an additional 8,000 parking spaces for spectators. The Union Station Garage and privately operated lots are used for general parking in addition to parking for events at Lumen Field and T-Mobile Park. There are no event-specific parking areas along Alaskan Way South near Base Seattle or Terminal 46. To minimize conflicts between event-related traffic and trucks traveling to and from Terminal 46, the entrance to Terminal 46 was moved from South Royal Brougham Way to South Atlantic Street in 2011 (SDOT 2011). South Atlantic Street/Edgar Martinez Drive offers direct access to I-5 and I-90 from Alaskan Way South and the current Terminal 46 entrance. I-90 eastbound, with ingress just east of the stadiums, does not typically experience congestion because its two lanes are somewhat evenly distributed to I-5 to the north, I-5 to the south, and I-90 to the east. Although the arrival period for event-related traffic within the Stadium District may overlap with the evening commute period for Base Seattle traffic prior to weeknight games, event-related traffic arriving to the stadiums will travel toward the area while Base Seattle commute traffic leaving the Base will travel away from the area, resulting in the low likelihood of overlapping traffic.

Freight. The City of Seattle *Freight Master Plan* identifies Alaskan Way South as a Major Truck Street, which indicates that it accommodates a significant amount of freight movement and connects to and from major freight traffic generators, such as seaports and rail yards (SDOT 2016a). The estimated AADT for truck traffic only on Alaskan Way South/East Marginal Way South in 2019 was approximately 1,500 trucks (WSDOT 2022). According to WSDOT's *2021 Freight and Goods Transportation System Update*, Alaskan Way South/East Marginal Way South is classified as a T-2 truck corridor, which means the roadway accommodates between 4 and 10 million freight tons annually and is therefore considered a high-volume truck corridor (WSDOT 2021d). The roadway provides connections from Port of Seattle shipping and intermodal facilities, including Terminals 30 and 46. Alaskan Way South serves as the dedicated route for oversized and overweight vehicles between the City's Industrial District south of Downtown Seattle and the Interbay industrial area north of Downtown Seattle. Freight traffic on Alaskan Way South includes regional truck trips and local commercial truck trips in addition to Port-related truck trips. Major Truck Streets near Base Seattle providing east-west connections from major

roadways (e.g., I-5, I-90, SR 99) to Alaskan Way South include South Royal Brougham Way and South Atlantic Street/Edgar Martinez Drive. SR 99 is also considered a Major Truck Street. The City of Seattle *Freight Master Plan* indicates that all arterial streets in the City may be used by freight, although arterials are not subjected to the same criteria for street design, traffic management, pavement design, and repair as Major Truck Streets (SDOT 2016a).

Vehicular access to Base Seattle may be restricted by rail and Port-related freight traffic in the area. Trucks associated with cargo operations at Terminals 30 and 46 and nearby rail yards may park along Alaskan Way South in front of Building 7 and block access to South Massachusetts Street and the Main ECP. In addition, congestion along South Massachusetts Street at the Main ECP may be worsened by vehicular and pedestrian traffic associated with the MSST boat maintenance area and the St. Martin de Porres homeless shelter in Building 7. Truck volumes in Seattle typically peak in the morning and stay relatively constant until the end of the evening rush hour period. This varies from non-truck volumes, which typically have a distinct morning and afternoon peak. The generally high overall truck traffic throughout the day is likely a result of trucks taking advantage of lower mid-day congestion levels combined with the large number and variety of freight-generating industries in Seattle that operate throughout the day. While high truck volumes are relatively constant throughout the day, sporadic periods of further heightened truck traffic near Base Seattle may occur. This heightened traffic may be attributed to periodic surges of export and import commodities at Port of Seattle facilities or delays on Major Truck Streets in the area from construction or vehicular accidents within the area. Additional traffic delays near Base Seattle may result from trucks and trains traveling to and from the Seattle International Gateway Intermodal Facility, a nearby railyard, which runs parallel to Alaskan Way South/East Marginal Way South, east of Terminal 30 and the southeast portion of Base Seattle. Travel times and intersection delays on Alaskan Way South and east-west Major Truck Streets near Base Seattle are anticipated to be the same for freight traffic as for general-purpose traffic (SDOT 2016a).

Pedestrian, Bicycle, and Transit Facilities. Pedestrian facilities near Base Seattle include a sidewalk on the west side of Alaskan Way South and the Portside Trail, which extends north from Base Seattle to South Atlantic Street, and the Elliott Bay Trail, which extends north from the Portside Trail. Bicycle facilities available near Base Seattle include proximal roadways, sidewalks along the west side of Alaskan Way South and along east-west streets, dedicated bicycle lanes on either side of Alaskan Way South/East Marginal Way South, and the Portside and Elliott Bay Trails. The Portside and Elliott Bay Trails allow for two-way, off-street use by all types of nonmotorized users and provides pedestrian and bicycle access to the Colman Dock Ferry Terminal, approximately 1 mile north of Base Seattle. Pedestrian volumes near Base Seattle are generally highest during the summer months and higher on weekend days rather than on weekdays. For both weekdays and weekends, the majority (80 percent) of pedestrian activity along the waterfront occurs during daytime hours. Bicyclists use bicycle facilities near Base Seattle for commuting and recreation, especially during the summer months. Data suggest that many bicyclists using Alaskan Way South are commuting to and from work. Accordingly, bicycle volumes are higher during the week than the weekend, and morning and evening bicycle volumes are similarly high (SDOT 2016b).

Transit service near Base Seattle is provided by King County Metro, Sound Transit, and Community Transit, which provide bus, streetcar, and commuter rail services. The nearest King County Metro stop to Base Seattle is east of the Base at the intersection of 1st Avenue South and South Atlantic Street, an approximate 0.6-mile walk. King County Metro also offers stops from several rapid bus lines at the intersection of Alaskan Way South and Columbia Street, an approximate 1-mile walk to the north of Base Seattle. This stop provides access to Colman Dock (King County Metro, 2021). Community Transit

provides bus service between communities in Snohomish County and downtown Seattle, with many routes terminating near Yesler Way and South Jackson Street between 2nd and 5th Avenues, an approximate 1.3-mile walk to the northeast of Base Seattle (Community Transit, 2019). The Sound Transit bus and light rail services primarily run parallel to 2nd and 4th Avenues with a stop for both services, approximate 0.5-mile walk to the east of Base Seattle (Sound Transit, 2021). Overall, the closest transit services are between a 0.6- and 1.3-mile walk from Base Seattle, or between a 15- and 30-minute walk for pedestrians.

The Colman Dock Ferry Terminal is accessed via Alaskan Way, approximately 1 mile north of Base Seattle. Washington State Ferries supports an average of 23.4 million riders (14 million in 2020) with a fleet of 21 auto-passenger vessels traveling between Seattle and surrounding neighborhoods. The terminal north of Base Seattle offers state ferry services across the Puget Sound to Bainbridge Island and Bremerton west of Seattle (WSDOT 2021c). Other marine transit services operating from Colman Dock include the King County Water Taxi, which operates three vessels with services between the Downtown Seattle waterfront (Pier 50); Seacrest Park in West Seattle; and Vashon Island (King County 2021). In addition, Kitsap Transit operates a weekday passenger-only fast ferry service from Pier 54, just north of Colman Dock, connecting Downtown Seattle with Bremerton, Kingston, and Southworth to the west (Kitsap Transit 2021). The Base Seattle piers and vessels moored within the berthing area at Piers 36 and 37 do not affect the navigation of vessels within the Duwamish Waterway or Elliott Bay (U.S. Coast Guard 2006).

Base Seattle personnel opting to use public transit to access Base Seattle may use a series of ferry, passenger rail, and bus services. The Colman Dock Ferry Terminal (1 mile north) and King Street Station (1.3 miles north/northeast) are the closest ferry and rail services to Base Seattle. From there, personnel could choose to walk, cycle, or drive to the Main ECP at Base Seattle, or take the bus to the nearest stop, which is approximately 0.2 mile east at the intersection of 1st Avenue South and South Atlantic Street and is serviced by King County Metro.

Base Seattle Transportation and Parking

Base Access. Vehicles access Base Seattle via South Massachusetts Street, which runs west from Alaskan Way South to the Main ECP at the southwestern corner of Building 7. On average, 760 single occupant vehicles, 25 vanpools, and 72 pedestrians arrive daily at Base Seattle through the Main ECP (Coast Guard 2021). Peak commuter arrival times at the Main ECP occur between 5:45 and 7:30 a.m., and peak commuter departure times occur between 1:30 and 3:00 p.m. Generally, a.m. commuter traffic at the Main ECP is greater than p.m. commuter traffic (Coast Guard 2021). The Main ECP also serves as the commercial gate for the Base and is used by trucks for deliveries. Vehicular access to Base Seattle may be restricted by rail and Port-related freight traffic in the area. Trucks associated with cargo operations at Terminals 30 and 46 and nearby rail yards may park along Alaskan Way South in front of Building 7 and block access to South Massachusetts Street and the Main ECP. A secondary gate may be made available, as needed.

Commute Trip Activity. The typical existing population on Base Seattle is 1,140 personnel, which includes Base personnel, personnel assigned to cutters, and personnel at collocated units. Decommissioning of cutters prior to the arrival of PSCs or other major cutters however is expected to reduce total personnel counts to as low as 800, which is uncharacteristically low and a temporary condition and does not provide an accurate representation of Base Seattle population. For the purposes of this analysis, 1,140 personnel were used to represent the existing Base Seattle population. Approximately 7 percent of personnel reach Base Seattle without a car (presumably by walking or

cycling), approximately 15 percent use vanpools, and the remaining personnel (78 percent) drive alone in their personal vehicles. A breakdown of Base Seattle commuter activity is provided in Table 3.4-2. In total, Base Seattle commuters generate 918 vehicle round trips per day. Existing contractor personnel add 223 vehicle round trips per day. When accounting for both arriving and departing trips, Base Seattle generates up to 2,282 one-way trips per day (1,840 Base Seattle personnel one-way trips plus 446 contractor personnel one-way trips) (Coast Guard 2021).

Table 3.4-2 Base Seattle Commute Trip Activity[1]

Commute Type	Percent Base Seattle Personnel	Number of Base Seattle Personnel	Vehicle Round Trips Generated per Day	Vehicle One-way Trips Generated per Day
Walking/Cycling/Transit	7	80	0[2]	0[1]
Vanpool	15	171	29[3]	58[2]
Personal Vehicle	78	889	889	1,778
Total	100	1,140	918	1,836

Source: Coast Guard 2021

Notes:

[1] Data represent distribution of personnel as of 2021 and was used as a representative distribution to predict distribution of personnel in the future. In reality, active duty personnel assigned Base Seattle rotate routinely, every few years, and future commute trip activity may be different from the 2021 data shown.

[2] Walking/cycling/transit trips do not contribute to total vehicle trips.

[3] Assumes six personnel per vanpool. One vanpool equates to one vehicle trip.

Commute trips for Base Seattle are distributed to the surrounding local and regional roadway network. Figure 3.4-2 shows the directional distribution for Base Seattle commute trips based on employee zip code data. The following key assumptions were used to determine commute trip distribution for Base Seattle personnel.

- Personnel would commute using shortest-distance routes
- Kitsap County residents would likely be more attracted to ferry usage
- Local resident commuters (i.e., commuters destined for central Seattle zip codes) and commuters destined for the Colman Dock Ferry Terminal would use surface streets rather than interstate freeways to avoid costs associated with tolls or avoid potential congestion on freeways used by commuters reaching zip codes outside the city
- Local resident commuters and commuters destined for central Seattle zip codes or the ferry terminal would use Alaskan Way South immediately east of the Main ECP and would move onto other local streets outside of the transportation study area
- Non-local commuters (i.e., commuters destined for zip codes outside of the City of Seattle) would use interstate freeways (e.g., I-5, I-90, SR 99) to reach their destination

Parking. Parking in Base Seattle is required for 100 percent of government-owned vehicles and equipment, and 80 percent of privately-owned vehicles. Existing parking on Base Seattle consists of 641 parking spaces to accommodate government-owned vehicles, equipment, and privately-owned vehicles. Parking is considered to be limited, supporting less than 50 percent of parking required for equipment and the 1,140 Base Seattle personnel. The lack of available parking required for government-owned vehicles, equipment, and privately-owned vehicles at Base Seattle has resulted in a substantial deficiency. To alleviate some of the deficiency, much of the available land area at Base Seattle has been dedicated to surface parking; nevertheless, parking continues to be considerably inadequate. The Coast Guard cannot lease private property for parking of privately-owned vehicles. In addition, using available

land area on Base Seattle for parking decreases the available space required for equipment laydown areas, flex space, maneuver areas, dockside access, and security standoff. Base Seattle operations and on-site vehicle circulation are restricted by the current parking configuration, which impinges on work areas, and displaces pedestrian walkways, outdoor amenities, and building access, resulting in inefficient operations (U.S. Coast Guard 2006).

Parking spaces at Base Seattle are primarily in outdoor lots. The first floor of Building 7 is used for parking boats and boat trailers, operational vehicles, and some privately owned vehicles. Trailer parking is available within the southwest portion of the Base near Buildings 10 and 12. In addition, Base Seattle leases approximately 1 acre of land southwest of Building 7 (i.e., Belknap Property) from the Port of Seattle for government-owned vehicle parking and equipment that cannot be accommodated on-site. The existing configuration of surface parking areas at Base Seattle does not allow buildings to meet security-related standoff distance criteria from parked vehicles (U.S. Coast Guard 2006). The lack of available space for security standoff distances has resulted in Base Seattle to be considered an unsecure installation susceptible to outside threats.

Inadequate parking availability at Base Seattle is often accommodated by free 24-hour parking on surface streets in the vicinity. Street parking immediately adjacent to Base Seattle is unreliable and does not remedy Base Seattle's parking requirements. To reduce incompatibility between the existing parking configuration and Base Seattle operations, a more efficient parking configuration with additional land for laydown areas and flex space is required.

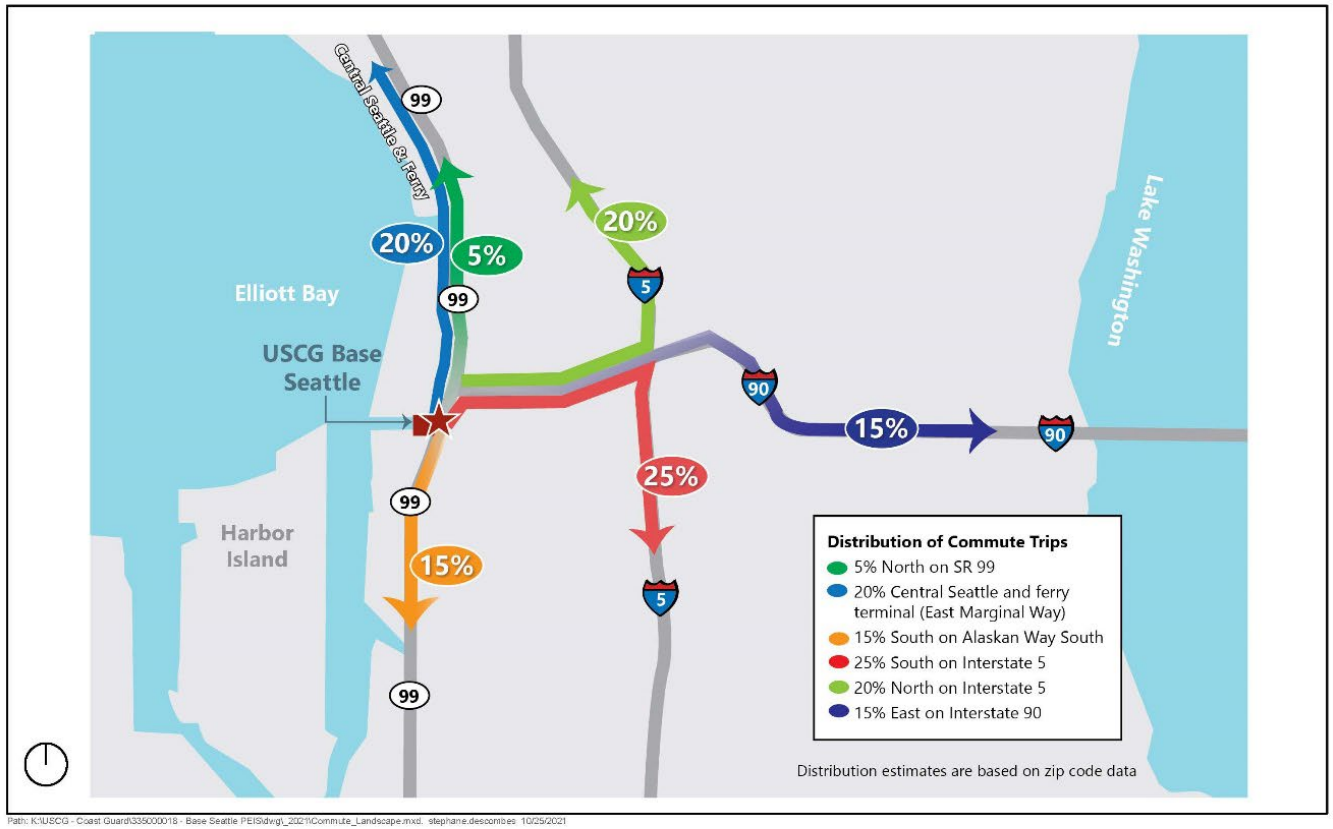
Parking at Base Seattle is required to accommodate 80 percent of privately-owned vehicles, including vehicles parked for long-term deployment. Currently, long-term parking is not reliably available at Base Seattle. Long-term cutter crew parking is provided off-site, approximately 43 miles north of Seattle, at the Navy's Family Support Complex in Marysville, Washington, near Naval Station Everett. The Navy's Family Support Complex parking area is a fenced lot with approximately 1,500 parking spaces. The drive time between Base Seattle and the long-term lot is approximately one hour in non-rush hour traffic.

Pedestrian, Bicycle, and Transit Facilities. The pedestrian and bicycle facilities at Base Seattle are limited. Crosswalks are included throughout the Base to accommodate pedestrians, along with sidewalks along the perimeter of a few buildings. There are no dedicated bicycle facilities, such as dedicated bicycle lanes or multi-use trails, at Base Seattle. In addition, Base Seattle provides transportation to and from the long-term deployment parking area at the Navy Family Support Complex.

3.4.4 Environmental Consequences of the Action Alternatives

This analysis includes consideration of long-term operational traffic increases following full program buildout, projected to be 2032, as wells as expected future traffic volumes at least 20 years from baseline conditions, in accordance with typical transportation analyses. Expected future traffic volumes were based on estimated 2045 forecasts, derived from current and historic traffic volume data published by WSDOT and SDOT, previous traffic studies within or near the transportation study area, and population and employment growth trends. A horizon year of 2045 is consistent with the Puget Sound Regional Council estimated travel demand forecasts based on land use projections that use a planning horizon of approximately 20 to 30 years. Recent transportation studies by SDOT and WSDOT, including the South Lake Union Transportation Study and the studies conducted for the Burke-Gilman Trail Missing Link Project and Alaskan Way Viaduct Replacement, with traffic projections based in part on Metropolitan Planning Organization modeling, were reviewed to determine an appropriate average annual traffic growth rate for the Base Seattle transportation study area.

Figure 3.4-2 Base Seattle Commute Trip Distribution



Base Seattle Commute Trip Distribution

FIGURE 3.4- 2

Land Acquisition

Acquisition of property within Terminal 46 and/or Terminal 30 could result in the displacement of Port activities, including freight traffic. The Port of Seattle would maintain the South Atlantic Street entrance to Terminal 46 and the East Marginal Way South entrance to Terminal 30. Operations at Terminal 46 and/or Terminal 30 however may decrease due to reduced terminal size, resulting in less freight traffic on nearby roadways, such as Alaskan Way South. The Port of Seattle may decide to relocate displaced operations to other nearby Port properties, resulting in increased freight traffic on other local roadways. These impacts on traffic would be unknown until such relocation has been determined. If the potential remains for significant, adverse impacts on a roadway's handling capacity, intersection or roadway function, or roadway accessibility after relocation has been determined by the Port, a separate evaluation of transportation impacts would be necessary.

Construction

No construction activities would occur beyond Base Seattle's footprint and the proposed acquired properties. In addition, parking displaced by construction activities, such as parking for boats operational vehicles from renovation or demolition of Building 7, would be relocated to acquired property within Terminal 46 and/or Terminal 30. Therefore, impacts on local and regional transportation would be related primarily to roadway traffic. It is not anticipated that waterside Port of Seattle freight operations or other marine facilities, such as passenger ferries, would be impacted during the construction period. Congestion related to freight operations at Terminals 30 and 46 however could be impacted by increased construction traffic.

Initial staging and construction support activities would involve heavy haul truck trips necessary to transport construction equipment and materials to Base Seattle. Depending on the delivery schedule, this may involve temporary rerouting of traffic (e.g., along Alaskan Way South). As described in the ECMs provided in Appendix E, the construction contractor would be responsible for preparing and implementing a Traffic Management Plan that would establish clear traffic routing and minimize detours.

Table 3.4-3 describes the anticipated traffic from construction, demolition, rehabilitation, and renovation associated with the proposed Base Seattle modernization program. Additional construction traffic, including daily commutes to and from Base Seattle for construction crews, as well as material delivery and demolition debris hauling, would increase the number of vehicles on local and regional roadways, such as I-5, I-90, SR 99, and Alaskan Way South. Daily construction worker commutes to and from Base Seattle would increase the number of one-way vehicle trips between Seattle and surrounding communities. Construction workers would typically travel to and from the area during peak morning and afternoon hours, which would add additional traffic on typical commuter routes. This construction commute traffic would be oriented toward Base Seattle during morning commute times, and away from Base Seattle during evening commute times. Therefore, construction-related traffic is unlikely to affect large event traffic associated with weekday events at Lumen Field or T-Mobile Park, for which traffic is oriented toward the Stadium District prior to and during evening commute times.

Additional traffic from construction would be minimal when compared with the AADT of local and regional roadways, such as Alaskan Way South and South Atlantic Street/Edgar Martinez Drive, which accommodate 9,200 vehicles and 29,000 vehicles, respectively (see Figure 3.4-1). As such, construction vehicles and daily construction worker commutes would represent only a small increase (between 0.01 and 5.2 percent) when compared with daily traffic volumes, and it is not anticipated that the additional

Table 3.4-3 Daily Construction Traffic Associated with the Proposed Action

Year	Construction Workers per Day	Construction Vehicles per Day	Total Daily One-Way Construction Vehicle Trips
2023	0	0	0
2024	34	11	90
2025	35	41	152
2026	30	19	98
2027	46	21	134
2028	180	33	426
2029	158	79	474
2030	88	50	276
2031	39	25	128
2032	6	5	22
2033	0	0	0

Notes: Values are approximate and represent the average daily construction traffic for a given year. The proposed construction period occurs from January 2024 through January 2032.

construction traffic would cause these roadways to exceed their operational capacity. Vehicle traffic from construction crews, delivery of material, and removal of debris, would be directed to the Main ECP, which, when combined with usual Base Seattle personnel traffic, may cause congestion along Alaskan Way South and inbound queuing delays during peak morning traffic periods.

Each of the alternatives would include implementation of ECMs included in Appendix E. As described previously, construction contractors would be responsible for preparing and implementing a Traffic Management Plan that would establish clear traffic routing and minimize detours. To reduce potential delays, construction-related vehicles could travel to and from Base Seattle during non-peak hour volumes. Further, construction equipment delivered during the initial staging and construction support phase would be kept on-site for the duration of construction activities, resulting in relatively few additional trips. No construction activities would take place along roadways used for public transit services. Transit services using Alaskan Way South or other local roadways that would be used by construction traffic could experience minor traffic delays during peak traffic periods. Any increases in traffic on local and regional roadways from construction activities would be temporary and would cease following the construction period. For further details regarding the ECMs that would be implemented to reduce potential impacts on transportation, see Appendix E.

Additional vehicles from construction crews traveling to, from, and within Base Seattle; delivery of materials to construction areas; and removal of debris would cause an increase in on-Base traffic. Construction traffic would compose a small to moderate percentage of the total Base traffic when compared with existing conditions and would likely be localized to the Main ECP and staging areas. Crews would park vehicles and equipment in spaces localized to construction areas and would not likely transit throughout Base Seattle during the workday, which could reduce potential on-Base congestion. It is not anticipated that construction traffic would affect the capacity of on-Base roadways. Increases in construction traffic at Base Seattle may increase the rate of deterioration for select roadways used by construction vehicles. Heavy construction vehicles such as dozers, loaders, and cranes, would however remain within a project site for the duration of construction activities, which would minimize impacts to on-Base and off-Base roadways. As construction vehicles would primarily travel between individual project sites on the Base, on-Base roadway surfaces would be reconstructed, as necessary.

Long-term Operations

The number of personnel at Base Seattle is expected to exceed baseline conditions (i.e., 1,140 personnel) in approximately 2026, and is expected climb to 1,900 personnel over the following seven years. The personnel loading sequence would coincide with the construction phase from 2024 through 2032. During this period, greater short-term impacts on local and regional roadways from the combined levels of construction and operational traffic could result. Table 3.4-4 summarizes the combined construction and operational one-way vehicle trips associated with both the construction phase and the personnel loading sequence. When considering the existing traffic levels (i.e., 2019 AADT) and handling capacity of local roadways with the distribution of the Base-related traffic throughout the region, the combined daily commute trips during the construction period would not cause local and regional roadways to function beyond their operational capacity, as identified in Table 3.4-1.

Table 3.4-4 Combined Construction and Operational One-Way Traffic Throughout the Proposed Modernization Program and Homeporting Sequence

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Cutters	3	3	3	3	3	4	6	6	6	6	7[1]	8[1]
Base Seattle Population	1,140[2]	825	825	1,000	1,150	1,300	1,450	1,550	1,550	1,450	1,800	1,900
Base Seattle Contractor Personnel	223	223	223	223	223	223	706	706	706	706	706	706
Base Seattle Daily One-Way Vehicle Trips[3,4]	2,282	1,774	1,774	2,056	2,298	2,539	3,747	3,908	3,908	3,747	4,850	4,946[5]
Construction Workers	0	0	34	35	30	46	180	158	88	39	6	0
Construction Daily One-Way Vehicle Trips[6,7]	0	0	90	152	98	134	426	474	276	128	22	0
Total Daily One-Way Trips	2,282	1,774	1,864	2,208	2,396	2,673	4,173	4,382	4,184	3,875	4,872	4,946

Notes:
[1] Surrogate years of 2032 for cutter 7 and 2033 for cutter 8 were used to represent potential additional cutter homeporting.
[2] Base population prior to decommissioning current cutters.
[3] Values assume all Base Seattle personnel and contractor personnel would travel to and from the Base daily. Long-term deployment parking is not considered.
[4] Values preserve existing modal distribution for Base Seattle personnel: 7 percent non-single occupancy vehicle (i.e., pedestrian, bicycle, and transit), 15 percent vanpool (at 6 personnel per vanpool), and 78 percent single occupancy vehicle commuters. Modal distribution was not applied to contractor personnel.
[5] Following the construction period, vanpools would not be used. Values assume vanpool commuters would travel via single occupancy vehicle following the construction period (i.e., starting in 2033), resulting in a new modal distribution of 7 percent non-single occupancy vehicle (i.e., pedestrian, bicycle, and transit) and 93 percent single occupancy vehicle commuters.
[6] Values assume all construction personnel would travel to and from Base Seattle daily in their personal vehicles. Potential construction-related pedestrian, bicycle, and transit commuters are not considered.
[7] Includes construction workers commutes and other construction-related trips such as material and equipment delivery.

Following the proposed Base Seattle modernization program, the Base population could reach as many as 1,900 personnel by 2032, an increase of approximately 760 personnel (approximately 67 percent). Up to 706 additional contractors would also be employed at the Base at one time for hull, mechanical, and electrical system work on cutters. The additional contractor personnel would bring the Base population to 2,606 personnel, which is more than double Base Seattle's existing population. Increases in Base personnel would add additional traffic on local and regional roadways, including Alaskan Way South.

Vanpools would no longer be used following the construction period; therefore, the modal distribution for commuters following the construction period was estimated to be 7 percent non-single occupancy vehicle (i.e., pedestrian, bicycle, and transit) and 93 percent single occupancy vehicle. The existing temporal and spatial commute patterns for Base Seattle personnel (excluding contractors) are expected to persist into the future. This translates to an increase from 2,282 one-way vehicle trips per day under existing conditions (1,364 vanpools and cars entering and exiting Base Seattle), to 4,946 one-way vehicle trips per day (2,473 cars entering and exiting Base Seattle), an increase of approximately 2,664 total daily one-way vehicle trips. The number of vehicle trips assumes six cutters would be berthed at the Base at one time, with two in drydock service; however, this scenario would occur only two or three times per year for a duration of two to three days at a time. Although the presence of 8 cutters at Base Seattle would be rare and this maximum use is unlikely to occur, it represents a worst-case analysis scenario. New Base Seattle personnel that are assigned to a major cutter would access the Base for long-term deployment parking and would not contribute to the number of daily vehicle trips to and from Base Seattle while at sea. In addition, dockside Base Seattle and contractor personnel would not often reach the maximum estimated total. The analysis of operational daily personnel vehicle trips shown in Table 3.4-5 assumes all personnel, regardless of if deployed on a major cutter, and the maximum potential contractor personnel, would commute daily to and from Base Seattle, and therefore, presents a conservative analysis of daily vehicle trips.

Long-term increases in traffic volumes were estimated using the expected Base Seattle personnel long-term population estimates timeline and AADT estimates for 2045 (see Figure 3.4-3). Note that once Base Seattle commute trips oriented to I-5 and I-90 pass 4th Avenue South (east of Base Seattle), they no longer affect local streets near the site. Trips oriented to local streets are expected to distribute primarily via: (1) Alaskan Way north of South Atlantic Street; (2) 1st Avenue South; (3) 4th Avenue South; (4) South Jackson Street; and (5) Yesler Way. The City of Seattle contains a robust street grid, providing a number of ways to travel between a wide range of destinations. Because of the wide range of potential destinations within Seattle and the robust street grid just north of the Base, it is impractical to estimate the daily traffic on each street in the transportation study area. The percent increase in daily traffic from such commuters are captured in the “other local streets”.

As a result of the increase in commute activity, some roadway facilities would see associated increases in daily traffic. Additional vehicles on roadways would result in relatively low percent traffic increases, as shown in Table 3.4-5. It is not expected that traffic increases from the additional Base Seattle personnel, when combined with estimated 2045 AADT volumes, would cause these roadways to function beyond their operational capacity.

The timeline of arrival for other major cutters and the timing of future traffic increases are notional and subject to change. To address the potential for traffic increases from the Proposed Action, the Coast Guard would enter into a memorandum of agreement with WSDOT to establish procedures for developing and implementing a traffic management program to manage Base-related traffic, especially during periods when commute activity is high, such as when all homeported cutters are moored at the Base, which would occur two or three times per year for two to three days at a time. The memorandum of agreement may also establish traffic management procedures to address potential traffic conflicts during event-related traffic at Lumen Field and T-Mobile Park.

Table 3.4-5 Traffic Changes from Base Seattle Personnel Increases

Facility	Base Seattle Commute Trip Distribution (percent)	2045 AADT	New Base Seattle One-Way Commute Trips[1,2,3]	New AADT (2045 AADT + New Base Seattle Commute Trips)	Percent Increase
SR 99 Tunnel	5	83,300	133	83,433	0.2
SR 99 South, via Alaskan Way S.	15	10,900	400	11,300	3.7
South Atlantic Street/Edgar Martinez Drive	60	34,800	1,598	36,398	4.6
Other local streets	20	Varies	533	Varies	N/A
Total	100	N/A	2,664	N/A	N/A

Notes:
[1] Values assume all Base Seattle personnel and contractor personnel would travel to and from the Base daily. Long-term deployment parking is not considered.
[2] Following the construction period, vanpools would not be used. Values assume vanpool commuters would travel via single occupancy vehicle following the construction period (i.e., starting in 2033), resulting in a new modal distribution of 7 percent non-single occupancy vehicle (i.e., pedestrian, bicycle, and transit) and 93 percent single occupancy vehicle commuters.
[3] Values represent the additional commute trips (2,665 one-way trips) that would result from the Proposed Action when compared to baseline conditions (2,281 one-way trips).

A portion of the additional personnel may choose to commute via the ferry system; however, it is unlikely the potential additional ridership would translate to additional ferry trips or changes to the existing ferry schedule. Therefore, long-term operations at Base Seattle would not impact waterside ferry and freight operations within the Duwamish Waterway and Elliott Bay. In addition, increased daily Base Seattle commute trips by walking and cycling, estimated at 80 per day, are not expected to result in capacity constraints on nearby sidewalks, bicycle lanes, or multi-use path facilities.

Base Seattle is unlikely to affect large event traffic associated with weekday or weeknight events at Lumen Field or T-Mobile Park. This is because Base Seattle traffic would be oriented away from Base Seattle and the Stadium District during evening commute times, as personnel travel home after completion of the workday. Further, Base Seattle traffic would not affect traffic associated with weekend events, because commuter traffic associated with Base Seattle is largely reduced on weekends.

Less than one half of the acquired property would be used for parking and vehicle circulation, which would address the deficiency in the existing parking and circulation configuration, resulting in direct, beneficial impacts. Under each action alternative, parking, circulation, and flexible use space would be provided in expanded areas to meet Base Seattle requirements while reducing congestion and improving traffic and materials movement within the Base footprint. It is anticipated that the new parking areas would be sufficient to accommodate the Base Seattle parking requirements (i.e., 100 percent of parking required for government-owned vehicles and equipment and 80 percent of parking required for privately-owned vehicles) for additional personnel that would be stationed at Base Seattle, and long-term parking at the Navy Support Complex in Marysville, Washington, would no longer be needed.

The additional Base Seattle personnel and contractors would more than double the total number of personnel accessing the Base daily, which could cause additional congestion on local roadways. Additional personnel assigned to a major cutter would, however, use the Base for long-term deployment parking and would not contribute to the number of daily vehicle trips to and from Base Seattle. The replacement of the current Main ECP and addition of a regularly used secondary ECP is expected to be more efficient and would increase security processing, reducing the potential for vehicle queuing during morning commute times on Alaskan Way South. The secondary ECP and queueing lanes would be sited within property

Figure 3.4-3 2045 AADT for Roadways near Base Seattle

2045 AADT for Roadways near Base Seattle

FIGURE
3.4-3

acquired at Terminal 46, reducing the potential for queueing on South Atlantic Street. The secondary ECP would also accommodate commercial deliveries to Base Seattle, reducing the intermixing of vehicle and truck traffic on South Massachusetts Street and lowering the potential for congestion. If a traffic study is completed, it would be used to inform the design and placement of the new secondary ECP to reduce potential congestion on South Atlantic Street to the maximum extent practicable. Further, a traffic study would inform the design and replacement of the Main ECP to reduce queueing delays and potential congestion on Alaskan Way South.

3.4.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Impacts on local and regional transportation under Alternative 1 would be identical to those described above. Acquisition of Terminal 46 property would displace some of the current and/or future cargo storage operations in the area, which may decrease Terminal 46 operations due to reduced terminal size and result in less freight traffic on nearby roadways, such as Alaskan Way South. Acquisition of a portion of Terminal 46 under Alternative 1 would not eliminate port operations entirely. The Port of Seattle may decide to relocate displaced operations to other nearby Port properties, resulting in increased vehicular freight traffic on other local roadways. These indirect impacts on traffic would be unknown until such relocation has been determined.

No construction would occur beyond Base Seattle's footprint or the proposed acquired properties. Construction activities and associated vehicle trips would be identical to those described above, which, under Alternative 1, would result in short-term, direct, adverse impacts. Construction-related traffic would be temporary and would cease following completion of construction activities. Additionally, major infrastructure projects would be phased to occur during a 3-year period when minimal personnel are present on the Base, which would reduce potential on-Base traffic increases.

Operational vehicle trips to and from Base Seattle would more than double following the proposed modernization program, resulting in long-term, direct, adverse impacts. This increase in commute activity is expected to result in increased daily traffic on local roadways. As demonstrated by the relatively low percent traffic increases shown in Table 3.4-5, increases in local traffic would not cause roadways to function beyond their operational capacity (see Table 3.4-1), and adverse impacts on these roadways would be minor to moderate.

The implementation of Alternative 1 would not result in increases in traffic volumes or delays to levels that impair a roadway's functionality, exceedance of a roadway's handling capacity, or substantial and permanent changes to roadway accessibility. Pursuant to NEPA, no significant impacts on transportation would be expected under Alternative 1.

3.4.4.2 Alternative 2 – Modernization with Additional Land at Terminals 30 and 46

Land acquisition would displace some of the operations at Terminals 30 and 46, and displace or eliminate operations at the MITAGS property and Jack Perry Memorial Park, resulting in decreased freight and vehicle traffic on area roadways. Acquisition of portions of Terminals 30 and 46 under Alternative 2 would not eliminate port operations entirely. As described for Alternative 1, the Port of Seattle may decide to relocate displaced operations to other nearby Port properties, resulting in increased vehicular freight traffic on other local roadways. These indirect impacts on traffic would be unknown until such relocations have been determined.

Implementation of Alternative 2 would result in a slightly reduced area for construction as compared to Alternative 1. Therefore, construction-related traffic and associated impacts on local, regional, and Base Seattle transportation would be reduced slightly under Alternative 2. Construction activities and associated vehicle trips under Alternative 2 would be identical to those described for Alternative 1.

Impacts from the projected increase in Base Seattle personnel following the proposed modernization program would be identical to those described for Alternative 1. Increases in commuter activity is expected to result in increased daily traffic on local roadways. As described for Alternative 1, increases in local traffic would not cause roadways to function beyond their operational capacity (see Tables 3.4-1 and 3.4-5), and direct, adverse impacts on these roadways would be minor to moderate.

As described for Alternative 1, implementation of Alternative 2 would not result in increases in traffic volumes or delays to levels that impair a roadway's functionality, exceedance of a roadway's handling capacity, or substantial and permanent changes to roadway accessibility. Pursuant to NEPA, no significant impacts on transportation would be expected under Alternative 2.

3.4.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

Impacts on local and regional transportation under Alternative 3 from land acquisition would be similar to those described for Alternative 1 and Alternative 2.

The area of disturbance under Alternative 3 (44.8 acres), would be slightly greater compared to Alternative 2 (43.5 acres) and slightly reduced compared to Alternative 1 (50.1 acres). Compared to Alternative 1, this would result in a slight reduction in the scope of construction activities. Therefore, associated construction-related impacts on local and regional transportation, as well as Base Seattle transportation and parking, would be slightly reduced, as compared to Alternative 1.

As described for Alternative 1 and Alternative 2, implementation of Alternative 3 would increase the Base personnel count and associated daily vehicle trips to and from the Base. Increases in local traffic would not cause roadways to function beyond their operational capacity (see Tables 3.4-1 and 3.4-5), and direct, adverse impacts on these roadways would be minor to moderate.

As described for Alternatives 1 and 2, implementation of Alternative 3 would not result in increases in traffic volumes or delays to levels that impair a roadway's functionality, exceedance of a roadway's handling capacity, or substantial and permanent changes to roadway accessibility. Pursuant to NEPA, no significant impacts on transportation would be expected under Alternative 3.

3.4.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, land acquisition; construction, demolition, rehabilitation, and renovation activities; and long-term expanded operations at Base Seattle would not occur. Therefore, while traffic levels in the region would be expected to continue to increase due to ongoing population growth, displacement of operations at Terminals 30 and 46 and other surrounding properties, construction activities and associated increases in vehicle trips, and increased Base Seattle operational traffic would not occur. As such, existing transportation facilities and traffic volumes would remain as described in Section 3.4.3, *Affected Environment,* and estimated 2045 AADT volumes are as presented in Figure 3.4-3.

3.4.6 Comparison of Alternatives

All action alternatives would result in acquisition of Port of Seattle property, which may affect Port operations and result in decreased traffic on roadways proximal to Base Seattle, such as Alaskan Way South. Short-term, adverse impacts associated with construction-related traffic may be reduced slightly under Alternatives 2 and 3 due to the reduced area of disturbance. All long-term, adverse impacts associated with Base Seattle's expanded operation would remain the same across all of the alternatives. Alternatives 1, 2 and 3 would result in short-term, direct, moderate, adverse impacts and long-term, direct, minor to moderate, adverse impacts on transportation. The number of vehicle trips used to assess impacts on transportation assumes six cutters would be berthed at the Base at one time, with two in drydock service. Although this maximum use is unlikely to occur, it represents a worst-case analysis scenario. The No-Action Alternative would not result in increases in traffic levels at and from Base Seattle. Pursuant to NEPA, alternatives 1, 2 and 3 would not result in significant impacts on transportation.

Table 3.4-6 Comparison of Alternatives for Transportation

Comparison of Alternatives for Transportation Impacts	
Alternative 1	No significant impacts.
Alternative 2	No significant impacts.
Alternative 3	No significant impacts.
No-Action Alternative	No impacts.

3.4.7 Environmental Conservation Measures

Each of the alternatives would include the implementation of ECMs. Some of these measures have been identified above (e.g., Traffic Management Plan) and their implementation would serve to avoid or minimize any adverse temporary or operational impact on transportation and parking. Additional measures include scheduling construction traffic during non-peak hours and keeping construction equipment and vehicles on-site for the duration of independent construction projects. Further details regarding implementation and compliance with these measures are provided in Appendix E. To address adverse impacts, the Coast Guard would consider flexible work schedules and telework arrangements for Base Seattle personnel in suitable positions to minimize commuter traffic and reduce or eliminate the need for daily commuter parking.

3.5 Air Quality

Summary of Findings

The Proposed Action and its Action Alternatives are exempt from the General Conformity Rule because there would be no direct or indirect emissions in nonattainment or maintenance areas. Any emissions would be *de minimis* (i.e., of minimum impact). Therefore, no significant impacts on air quality would be expected.

3.5.1 Background

Air quality contributes to the health and wellness of people and the environment and is typically considered within an airshed. An airshed is defined as an area where air circulation is determined by geographical location and other physical features (e.g., topography) that affect temperature as well as wind speed and direction (USEPA 2021a). In addition to natural factors, air quality within an airshed is affected by human sources, including stationary sources (e.g., industrial development) and mobile sources (e.g., passenger vehicles, heavy duty trucks). Air quality in urban areas is a function of several factors, such as the quantity and type of pollutants emitted locally and regionally as well as the transport rate of those pollutants.

Criteria Air Pollutants

USEPA has established National Ambient Air Quality Standards (NAAQS) for six common air pollutants (i.e., criteria pollutants). These air pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter equal to or less than 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$) in diameter, and lead (Pb). The NAAQS represent the maximum levels of background pollution that are considered safe for the purposes of protecting public health and welfare. The Clean Air Act (CAA) Amendments of 1990 require that federal agency activities conform to the State Implementation Plan (SIP) with respect to achieving and maintaining attainment of NAAQS.[4]

Hazardous Air Pollutants

Hazardous air pollutants (HAP) are those pollutants that are known or suspected to cause cancer or other serious health effects or adverse environmental effects. Most HAPs originate from human-made sources, including mobile sources (e.g., cars, trucks, buses), stationary sources (e.g., factories, refineries, power plants), and indoor sources (e.g., some building materials and cleaning solvents) (USEPA 2021c). Examples of HAPs include benzene, which is found in gasoline, and methylene chloride, which is used as a solvent and paint stripper. Other examples include asbestos and heavy metals such as cadmium, mercury, chromium, and lead compounds.

In total, USEPA regulates 187 HAPs under the National Emissions Standards for Hazardous Air Pollutants (NESHAP) program. Emitters are considered "major" sources if they emit 10 or more tons per year (tpy) of any of more than 150 HAPs, or 25 tpy or more of any combination of HAPs. Smaller emitters are considered "area" sources when they emit less than 10 tpy of any single HAP.

[4] An area is designated in attainment when it is in compliance with NAAQS. Nonattainment means that an area has too much of one or more criteria air pollutants and the area must reduce emissions to reach or attain the official, health-based limits for that pollutant.

3.5.2 Approach to Analysis

This analysis considers existing air quality conditions within the Salish Sea airshed (see Figure 3.5-1) and assesses whether the Proposed Action or any of its alternatives would result in a contribution to a violation of NAAQS.

The USEPA General Conformity Rule ensures that the actions taken by federal agencies do not interfere with a state's plans to attain and maintain national standards for air quality. The rule requires that conformity analyses be performed to demonstrate that federal actions do not:

- Cause or contribute to any new violation of any NAAQS in the area,
- Interfere with provisions in the SIP for maintenance or attainment of any NAAQS,
- Increase the frequency or severity of any existing violation of any NAAQS, or
- Delay timely attainment of any NAAQS, any interim emission reduction goals, or other milestones included in the SIP.

Emissions of criteria air pollutants from federally sponsored, approved, or funded activities in areas that do not meet the NAAQS are considered *de minimis* if they are below established thresholds (40 CFR §93.153).[5] If these activities are expected to produce emissions greater than the *de minimis* thresholds, the responsible federal agency would be required to comply with the USEPA General Conformity Rule. If the air basin is attainment for all criteria pollutants, conformity analysis is not required. All *de minimis* thresholds are calculated in tons per year. The analysis considers the maximum area of ground disturbance and the maximum construction activity for each phase of the project. For purposes of this analysis, it is estimated that construction and personnel numbers at Base Seattle would peak 2028. For example:

- Fugitive dust is based upon the maximum amount of ground disturbance since it would result in the greatest release of fugitive dust.
- Criteria pollutant emissions are area calculated for the most intensive year of activity (2028) during the entire construction program.
- Operational emissions are calculated based upon the last year when commuting and operations are at full capacity.

Additionally, given the total duration of the construction program, the analysis also considers the overlap of construction emissions with operational emissions (see Table 3.5-5).

3.5.3 Affected Environment

Regional Setting

Air quality within the Salish Sea airshed is generally affected by temperature differences and winds from the Pacific Ocean and circulation patterns across the Straits of Georgia and Juan de Fuca and the Puget Sound (see Figure 3.5-1). Air quality within the Salish Sea airshed is monitored at 13 air monitoring stations, the closest to Base Seattle are the Seattle Duwamish and Seattle South Park stations.

[5] The phrase *de minimis* means "of minimum impact." The USEPA has defined *de minimis* thresholds for criteria air pollutants, which indicate that there would be no significant contamination of an air mass.

Figure 3.5-1 Salish Sea Airshed

PEIS	Salish Sea Airshed	FIGURE 3.5-1

The greater Seattle-Tacoma area, which is located within the Salish Sea airshed, is in attainment for all criteria pollutants. The airshed was previously designated as nonattainment for O_3, CO, and PM_{10} (USEPA 2021b). Maintenance levels have been achieved and the 20-year maintenance period has been completed.

Port of Seattle/Northwest Seaport Alliance Emissions

The Puget Sound Maritime Emissions Inventory quantifies maritime-related emissions and compares emissions levels against previous inventories (Starcrest Consulting Group, LLC 2018). The inventory includes data from major Puget Sound ports, the Washington State ferry system, regional rail operators, Port-related petroleum facilities, and other non-military vessel operators. The Port of Seattle includes four container terminals that cover more than 500 acres. Hundreds of trucks transit the Port each day, moving cargo to rail lines or other destinations (Port of Seattle 2016). These terminal operations contribute to annual criteria air pollutant emissions at the Port.

The most recent inventory for the Port was prepared in 2016. It was updated in 2018 to provide new information on cargo volumes and allocation of emission sources between the Port of Seattle and NWSA. This inventory determined that air emissions in 2016—including criteria air pollutants and HAPs—were lower than levels inventoried in 2005 (Starcrest Consulting Group, LLC 2018). Emissions from vessels, locomotives, cargo-handling equipment, heavy-duty vehicles, and fleet vehicles were reduced by between 25 percent (NO_x) and 96 percent (SO_2). Much of the emissions reductions were due to significant, voluntary investments in cleaner equipment, vessels, trucks, and fuels by the Port, the maritime industry, and government agencies, along with efforts to improve operational efficiency. As a result, air quality at the Port has improved over this time period.

Base Seattle Emissions

Stationary source emissions at Base Seattle are primarily pier-side infrastructure that supports homeported vessels at berth, such as emergency generators. Additional stationary source emissions are associated with HVAC and other utilities usage associated with shore-side infrastructure, including the 10 existing buildings on Base. Mobile source emissions associated with Base Seattle are generally related to support equipment on Base, vehicular trips in support of Base operations, and commute trips by Base personnel. Additional mobile source emissions associated with operation of vessels, including the major cutters and small boats, may occur both within the air basin (small boats and transiting cutters) and outside the air basin (cutter operations).

3.5.4 Environmental Consequences of the Action Alternatives

Land Acquisition

Property acquisition under any of the alternatives would result in the displacement of existing Port operations, such as cargo storage, transport, and related services. These displaced functions would either be eliminated or relocated elsewhere within Port property. If these functions were to be eliminated, associated operational emissions (e.g., mobile source emissions associated with the transport of cargo containers) would also be eliminated. If these functions were relocated, there would be changes in long-term mobile source emissions (e.g., associated with the change in distance that trucks would be required to travel in order to transfer cargo containers). It is highly likely that existing Port functions would be relocated elsewhere within the Port. Emissions associated with the relocated functions would remain within the airshed and any changes in emissions would be negligible.

Construction

Criteria air pollutant emissions would occur as a result of construction, demolition, rehabilitation, and renovation activities associated with the proposed modernization of Base Seattle. Emissions would fluctuate throughout the construction phase, with emissions peaking during construction events (see Tables 3.5-1 through 3.5-5).

Emissions would begin with mobilization, staging, and construction support activities. Construction traffic, including export of demolition debris, delivery of materials, and construction worker commutes, would increase the number of vehicles transiting on local and regional roadways. Criteria air pollutant emissions from these construction activities would however remain well below *de minimis* thresholds (see Table 3.5-1).

HAPs could also be generated during staging and construction support activities as a result of the generation, use, and storage of hazardous materials and wastes. Such hazardous materials and wastes, however, would be in limited quantities and in compliance with all applicable federal, state, and local laws, regulations, and guidance, as necessary. Issues related to asbestos and other hazardous building materials are addressed in detail in Section 3.11, *Hazardous Materials and Wastes*.

Table 3.5-1 Maximum Estimated Annual Construction Worker Commute and Construction-related Heavy Haul Truck Trip Emissions (2028) (tons per year)

Activity	Mileage	VOCs (tpy)	CO (tpy)	NO_x (tpy)	SO_x (tpy)	PM (tpy)
Heavy Haul Truck Trips	2,176,000	1.3	8.2	8.4	<0.1	0.6
Construction Worker Commute Trips	1,480,000	0.4	3.1	0.3	<0.1	0.1
Total	**-**	**1.7**	**11.3**	**8.7**	**<0.1**	**0.7**
de minimis thresholds	-	100	100	100	100	100

Note: See Appendix J for mileage assumptions, emissions factors, and relevant references.

Fugitive dust would be generated during facility construction activities, including from demolition of pavements and sidewalks, seismic stabilization, and other excavation and grading activities. Fugitive dust emissions generated by such activities can vary substantially depending on levels of activity, specific operations, and prevailing meteorological conditions. The standard dust emission factor for general, non-residential construction activity is conservatively estimated at 0.42 tons of PM_{10} generated per acre per month of activity (USEPA 2006). Per procedures documented in the National Emissions Inventory (USEPA 2006), $PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions (see Table 3.5-2) and would be similar across all action alternatives.

The USEPA National Emissions Inventory documentation assumes that emissions resulting from construction-related activities are uncontrolled. Fugitive dust resulting from demolition and grading activities can be reduced through the implementation of standard dust minimization practices, including regularly watering exposed soils and soil stockpiling as noted in ECMs listed in Appendix E. When properly implemented, these dust minimization measures—estimated in Table 3.5-2—can reduce dust generation by up to 50 percent (USEPA 2006).

Table 3.5-2 Maximum Annual Fugitive Dust Emissions (2028) (tons per year)

Maximum Disturbed Area per Year	PM_{10} Emissions (tpy)	$PM_{2.5}$ Emissions (tpy)	Total Fugitive Dust Emissions (PM_{10} and $PM_{2.5}$) (tpy)	Potential Fugitive Dust Emissions with Implementation of ECMs (tpy)
14.75 acres	74.3	7.4	81.8	40.9
de minimis thresholds				100

Note: See Appendix J for mileage assumptions, emissions factors, and relevant references.

The use of heavy construction equipment for landside construction activities and in-water construction activities at Terminal 46 would also generate short-term increases in criteria air pollutant emissions (see Table 3.5-3). Criteria air pollutants associated with heavy construction equipment would be similar to those found in most common construction activities. Even with conservative assumptions (e.g., all heavy equipment in operation for 8 hour per day, 5 days per week, 12 months per year; refer to Chapter 2, *Description of Proposed Action and Alternatives*), criteria pollutant emissions would remain below *de minimis* thresholds.

Heavy construction equipment is in operation currently within the airshed and may be redistributed from other project to support of the proposed construction, demolition, rehabilitation, and renovation activities at Base Seattle. As such, these emissions may not necessarily constitute new sources of emissions in the air basin.

Table 3.5-3 Annual Heavy Construction Equipment Emissions in 2028 (tons per year)

	Hours of Operation per Year	VOCs (tpy)	CO (tpy)	NO_x (tpy)	SO_x (tpy)	PM (tpy)
Total Annual Heavy Construction Equipment Emissions	1,920	1.0	5.3	6.3	<0.1	0.3
de minimis thresholds	-	100	100	100	100	100

Note: The heavy construction equipment emissions quantified in Table 3.5-3 are associated with the hours of equipment operation and independent of the specific location of these activities.
See Appendix J for mileage assumptions, emissions factors, and relevant references.

Long-term Operations

The replacement of existing facilities at Base Seattle with new and expanded facilities would support existing and programmed operations as well as an associated increase in personnel. As described in Chapter 2, *Description of Proposed Action and Alternatives*, the Base population could reach as many as 1,903 assigned personnel and 706 contract personnel by 2032 (i.e., an increase of approximately 763 personnel). While the emissions associated with increased personnel and overall development footprint on Base would increase, the replacement of outdated facilities at Base Seattle would likely offset or reduce the total operational emissions.

In accordance with applicable laws and regulations, Coast Guard policy (Coast Guard 2014), and Coast Guard guidance (Coast Guard 2020), the Coast Guard would include design elements in construction projects to improve resiliency and sustainability of future facilities. The Coast Guard would conduct construction in accordance with The Guiding Principles for Sustainable Federal Buildings and Associated Instructions (CEQ 2020) or applicable guidance at the time of construction. The Guiding Principles

provide agencies with a means to meet statutory provisions relating to high-performance sustainable buildings. The guiding principles ensure federal buildings:

- Employ integrated design principles,
- Optimize energy performance,
- Protect and conserve water,
- Enhance the indoor environment,
- Reduce the environmental impact of materials,
- Assess and consider building resilience.

In addition, in accordance with EO 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, and its accompanying Federal Sustainability Plan, the Coast Guard would target the following objectives in the redevelopment of Base Seattle:

- Net-zero emissions operations by 2050 (65% greenhouse gas [GHG] reduction from 2008 levels by 2030),
- 100% carbon pollution-free electricity (CFE) by 2030 (50% on a 24/7 basis),
- Net-zero emissions buildings by 2045 (50% reduction by 2032),
- 100% net-zero emission vehicle acquisition by 2035 (100% light-duty acquisitions by 2027),
- Net-zero emissions procurement by 2050,
- Climate resilient infrastructure and operations, and
- Climate and sustainability-focused workforce.

All actions pursuant to the objectives of the Guiding Principles must be consistent with applicable laws and regulations and are subject to the availability of appropriations or other authorized funding.

Because the Coast Guard is only in the programmatic level of planning for Base Seattle modernization, it has not initiated detailed design for any future construction projects. In seeking to meet the objectives of the guiding principles, future planning and designs may consider a wide range of design features and compliance with evolving guidance and EOs in place at the time (see Section 3.10, *Utilities and Public Services*). These design features would result in overall improvements to building and operational efficiencies, which would result in an overall reduction in emissions associated with long-term operations of the Base.

In addition, infrastructure improvements would provide shore-side power for all homeported cutters, eliminating the need for cutters to operate their engines while in port, and reducing vessel emissions. Vessels would only be required to operate engines—and generate emissions—during arrival and departure and while undergoing maintenance activities.

To the extent applicable, all new and modified emissions sources would be approved in a Puget Sound Clean Air Agency Notice of Construction Application. Unless conditions change (e.g., the region's air quality ceases to be in attainment or if USEPA lowers thresholds significantly to require minor sources of emissions to apply for Title V permits), it is unlikely that new or renovated facilities would require Title V operating permits administered by the Department of Ecology. For attainment areas, such as greater Seattle-Tacoma, new sources would obtain a Prevention of Significant Deterioration (PSD) permit from the Department of Ecology that limits criteria air pollutant emissions to a maximum allowable increase.

Operations and associated personnel could result in a build-out Base population of up to 1,903 assigned personnel and up to a maximum of 705 contract personnel. This represents a conservative estimate of the Base population given that hundreds of Coast Guard personnel may be out to sea at any given time and therefore would not be commuting daily to the Base. Emissions estimates associated with vehicle trips are shown in Table 3.5-4.

Table 3.5-4 Annual Personnel Commute Emissions in 2033 (tons per year)

Activity	Mileage	VOCs (tpy)	CO (tpy)	NOx (tpy)	SO_x (tpy)	PM (tpy)
Total Increase in Commute Trips at Completion of the Program (FY 2033)	31,260,000	7.9	65.9	5.9	0.2	2.5
de minimis thresholds	-	100	100	100	100	100

Note: See Appendix J for mileage assumptions, emissions factors, and relevant references.

Given that construction activities would occur concurrently with regular Base operations, emissions from these different activities, as shown in Tables 3.5-1 through 3.5-4, would occur simultaneously. Table 3.5-5 aggregates the emissions from the different sources construction and operational activities. As shown in Table 3.5-5, total emissions are not anticipated to exceed *de minimis* thresholds.

Table 3.5-5 Total Annual Emissions including Construction and Operations at Base Seattle (tons per year)

Activity	VOCs (tpy)	CO (tpy)	NOx (tpy)	SO_x (tpy)	PM (tpy)
Construction-related Commutes and Heavy Haul Truck Trips (see Table 3.5-1)	1.7	11.3	8.7	<0.1	0.7
Maximum Annual Fugitive Dust Emissions (see Table 3.5-2)	-	-	-	-	40.9
Annual Heavy Construction Equipment Emissions (see Table 3.5-3)	1.0	5.3	6.3	<0.1	0.3
Coast Guard Personnel Commute Trip Emissions (see Table 3.5-4)	7.9	65.9	5.9	0.2	2.5
Total	**10.6**	**82.5**	**20.9**	**0.2**	**44.4**
de minimis thresholds	100	100	100	100	100

Note: See Appendix J for mileage assumptions, emissions factors, and relevant references.

3.5.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

The implementation of Alternative 1 would result in the displacement of cargo storage operations within Terminal 46. These displaced functions would either be eliminated or relocated elsewhere within Port property. If displaced, there would be a consequent reduction in emissions in the airshed from reduced port activities. If relocated, these uses would still occur within the airshed and therefore would not result in any measurable change in regional air quality related to stationary or mobile source emissions.

Short-term, adverse impacts on stationary and mobile source emissions would be similar to those described above. The construction-related emissions described above are based on conservative construction-related vehicle assumptions, heavy construction equipment usage, and maximum areas of

disturbance during construction for the projected maximum year of 2028. Specific construction activities under Alternative 1 would fit within these assumptions and therefore, criteria air pollutant emissions would not exceed *de minimis* thresholds (see Tables 3.5-2 through 3.5-5).

Long-term operational impacts would also be similar to those described above. While the overall development footprint on Base Seattle would be increased, the replacement of outdated facilities on Base would reduce or partially off-set overall stationary source emissions. Increases in assigned personnel and contract personnel would result in an increase in mobile source emissions associated with vehicle commutes. Operational emissions would however remain below *de minimis* thresholds.

The implementation of Alternative 1 would not be expected to cause or contribute to any new violation of any NAAQS in the area, interfere with provisions in the SIP for maintenance or attainment of any NAAQS, increase the frequency or severity of any existing violation of any NAAQS, or delay timely attainment of any NAAQS, any interim emission reduction goals, or other milestones included in the SIP.

Pursuant to the CAA, a Conformity Determination is not required for Alternative 1, because all direct and indirect emissions in nonattainment and maintenance areas would not exceed applicable *de minimis* levels. Pursuant to NEPA, Alternative 1 would have no significant impacts on air quality.

3.5.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

The implementation of Alternative 2 would result in Coast Guard acquisition of one berth at Terminal 46 and a portion of Terminal 30, resulting in the displacement of Port functions and emissions associated with these functions. These changes in emissions would be similar to that described for Alternative 1. The additional relocation of functions at the MITAGS property under Alternative 2 would likely also be within the Port, or to a nearby site, but would likely remain within the airshed.

Short-term adverse impacts on stationary and mobile source emissions would be similar to those described above for the Proposed Action. While Alternative 2 would include the development of two new berths at Piers 35E/F, work would include typical construction for waterfront facilities. As described in Section 2.4, *Proposed Action*, the extent of a CERCLA action that would have to occur prior to any pier construction is not currently known. Nevertheless, the construction-related emissions described for the Proposed Action are based on conservative construction-related vehicle assumptions, heavy construction equipment usage, and maximum areas of disturbance during construction. Specific construction activities under Alternative 2 would fit within these assumptions and therefore, criteria air pollutant emissions would not exceed *de minimis* thresholds during the maximum year of activities in 2028 (see Tables 3.5-2 through 3.5-5).

Long-term operational impacts would also be similar to those described above for the Proposed Action. While the overall development footprint on Base Seattle would be increased, the replacement of outdated facilities at the Base would reduce or partially off-set overall stationary source emissions. Increases in assigned personnel and contract personnel would result in an increase in mobile source emissions associated with vehicle commutes. Operational emissions however would remain below *de minimis* thresholds.

Implementation of Alternative 2 would not cause or contribute to any new violation of any NAAQS in the area; interfere with provisions in the SIP for maintenance or attainment of any NAAQS; increase the frequency or severity of any existing violation of any NAAQS; or delay timely attainment of any NAAQS, any interim emission reduction goals, or other milestones included in the SIP.

Pursuant to the CAA, a Conformity Determination is not required for Alternative 2, because all direct and indirect emissions in nonattainment and maintenance areas would not exceed applicable *de minimis* levels. Pursuant to NEPA, Alternative 2 would have no significant impacts on air quality.

3.5.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

The implementation of Alternative 3 would result in the acquisition of a portion of Terminal 46, as well as the MITAGS property, and the displacement of these functions and emissions associated with these functions. These changes in emissions would be similar to that described for Alternative 1.

Short-term adverse impacts on stationary and mobile source emissions would be similar to those described for Alternatives 1 and 2. Alternative 3 would include the development of one new berth at Pier 35. As described for Alternative 2, development of this berth would include typical construction for waterfront facilities. The extent of a CERCLA action that would likely occur prior to any pier construction is not currently known. Nevertheless, the construction-related emissions described for the Proposed Action are based on conservative construction-related vehicle assumptions, heavy construction equipment usage, and maximum areas of disturbance during construction. Specific construction activities under Alternative 3 would fit within these assumptions and therefore, criteria air pollutant emissions would not exceed *de minimis* thresholds within the maximum projected year of 2028 (see Tables 3.5-2 through 3.5-5).

Long-term operational impacts would also be similar to those described for Alternatives 1 and 2. While the overall development footprint on Base Seattle would be increased, the replacement of outdated facilities on the Base would reduce or partially off-set overall stationary source emissions. Increases in assigned personnel and contract personnel would result in an increase in mobile source emissions associated with vehicle commutes. Operational emissions would however remain below *de minimis* thresholds.

Implementation of Alternative 3 would not cause or contribute to any new violation of any NAAQS in the area; interfere with provisions in the SIP for maintenance or attainment of any NAAQS; increase the frequency or severity of any existing violation of any NAAQS; or delay timely attainment of any NAAQS, any interim emission reduction goals, or other milestones included in the SIP.

Pursuant to the CAA, a Conformity Determination is not required for Alternative 3, because all direct and indirect emissions in nonattainment and maintenance areas would not exceed applicable *de minimis* levels. Pursuant to NEPA, Alternative 3 would have no significant impacts on air quality.

3.5.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, there would be no changes related to land acquisition, construction, demolition, renovation, or long-term operations at Base Seattle. As such, there would be no changes in existing emissions at the Port of Seattle related to the displacement of functions on Terminal 46, Terminal 30, or any of the other proposed acquired properties. No temporary construction-related emissions associated with Base Seattle modernization would occur. Existing facilities and infrastructure would continue to have emissions and remain unimproved from current conditions. No upgrades to enable energy efficiency or reduce emissions would be implemented at Base Seattle, resulting in a missed opportunity to implement sustainability measures and minor, adverse impact. Vehicle trips would remain the same with no change in emissions. It is expected that air quality would continue to improve at the Port following the trend in emissions reductions from 2005 to 2016.

3.5.6 Comparison of Alternatives

All of the alternatives, including the No-Action Alternative, would result in *de minimis* emissions. The difference in criteria pollutant emissions across the alternatives would not have a measurable change in effects within the airshed. Similarly, none of the alternatives would change the airshed's attainment status. Under the No-Action Alternative, existing facilities and infrastructure would remain unimproved from current conditions. No upgrades to enable energy efficiency or reduce emissions would be implemented, resulting in a missed opportunity to implement sustainability measures. Therefore, pursuant to the CAA and NEPA, the Proposed Action is exempt from the General Conformity Rule, because there would be no reasonably foreseeable direct or indirect emissions in nonattainment or maintenance areas, and there would be no significant impacts on air quality.

Table 3.5-6 Comparison of Alternatives for Air Quality Resources

Comparison of Alternatives for Air Quality Resources Impacts	
Alternative 1	No significant impacts.
Alternative 2	No significant impacts.
Alternative 3	No significant impacts.
No-Action Alternative	No significant impacts.

3.5.7 Environmental Conservation Measures

Each of the alternatives would include the implementation of ECMs. Although no significant impacts to air quality have been identified, some of these measures are standard construction measures (e.g., standard dust minimization practices, including regularly watering exposed soils and soil stockpiling) and their implementation would serve to avoid or further minimize any adverse temporary or operational impacts. These ECMs would apply to all of the action alternatives. See Appendix E for further details regarding these measures and how they would be implemented.

3.6 Biological Resources

Summary of Findings

The action alternatives have the potential to cause direct and indirect adverse effects. The upland activities are likely to have only minimal impacts on biological resources. Details for future in-water activities are not available at this time, nor is it known what species or habitats may be federally protected in the area where in-water work occurs. Therefore, the analysis of in-water work is bound by what is known about future in-water work to rehabilitate or build piers and mitigations measures necessary to reduce impacts, while acknowledging that the best available science may evolve such that future analysis is going to be necessary. Given these caveats, the species most likely to be affected by future in-water work are marine mammals (southern resident killer whale [SRKW], harbor porpoise) that occur within the area and Chinook salmon that migrate through the area. Critical habitat for SRKWs and Chinook salmon occurs in the area, along with essential fish habitat (EFH) for salmon and groundfish. Impacts on in-water habitats would be addressed through Endangered Species Act (ESA) Section 7 consultations, EFH consultations, and applications for authorizations under the Marine Mammal Protection Act (MMPA). The Coast Guard will work with USFWS on any impacts on MBTA species that may occur from in-water activities. The impacts of upland activities are not considered significant. The impacts of future in-water activities are not considered significant because Coast Guard is committed to working with the Services to minimize impacts and follow any measures required as a result of consultations and/or authorizations. No impacts to biological resources, either adverse or beneficial, would result from the No-Action Alternative.

3.6.1 Background

Biological resources have both a physical (habitat) and biological (species) component. The physical component is composed of the waters, lands and air in the areas where the actions would occur and the adjacent areas where impacts of the action would occur. The physical component includes various habitat community types. Some habitats are protected under federal law (e.g., critical habitat) because they are important for the continued survival of species. The biological component is composed of all animal and plant species in the habitat. Some species are also protected under federal law (e.g., Endangered Species Act [ESA] listed species) because they are in danger of becoming endangered or going extinct or are protected by international agreements (e.g., Migratory Bird Treaty Act [MBTA]). Biological resources that may be impacted by the action are diverse and include both terrestrial (on land) and aquatic (in water) communities. Marine mammals are federally protected under the Marine Mammal Protection Act (MMPA). In addition, some habitats are considered Essential Fish Habitat (EFH) under the Magnuson-Stevens Fisheries Conservation and Management Act (MSA) or may be designated critical habitat under the ESA.

Terrestrial biological resources include plants and animals that occur within the typical urban Seattle upland habitat. Aquatic biological resources include plant and animal species that occur within the adjacent lower Duwamish River and Elliott Bay. The occurrence and abundance of many species can vary throughout the year (e.g., breeding birds) and from year to year (e.g., salmon returns).

3.6.2 Approach to Analysis

This analysis evaluates the potential impacts on all biological resources resulting from activities associated with the action alternatives. The analysis considers both the context and intensity of each impact to determine whether actions taken under any of the alternatives meet the threshold for significance.

Biological resources that may be affected by the action alternatives were identified first by defining the potential area of impact, or Action Area. As defined by the ESA, an Action Area identifies the geographic extent of a project based on direct and indirect physical, biological, or chemical effects associated with each of the proposed project elements. It is also may include the extent of any interrelated and interdependent activities. The federal ESA considers interrelated and interdependent activities to be consequences of a proposed action that would not occur but for the action and are reasonably certain to occur. Using this standard, an Action Area may extend beyond the footprint of an action and include affected areas. Affected areas are areas where effects of the action may impact biological resources. For example, an activity such as pile driving has a small spatial footprint, but the sound and vibrations from the pile driving may impact biological resources outside the spatial footprint.

For this analysis, the extents of the affected areas are calculated consistent with the ESA requirements. The information used and method for deriving the extent of the Action Areas under each action alternative is provided in the "Action Areas" discussion below.

Once the Action Areas were defined, biological resources that could be present within the Action Areas were determined. Information regarding the biological resources with the potential to occur in the Action Areas is based on, but not limited to, existing NEPA documentation, Incidental Harassment Authorizations within Elliott Bay, and standard regulatory agency developed documents/records (e.g., IPAC, Protected Resources App).

The components of the project with the potential to cause environmental impacts were then compared against the list of biological resources identified within the Action Areas to determine if adverse impacts to those species or habitats could occur.

For a wildlife species to be affected, they must be exposed (directly or indirectly) to an impact causing element, or stressor. They then must have a response when considered in context of the environment. For example, the noise from construction (stressor) is heard by a bird at its nesting site (exposure). This noise may be loud enough to cause the bird to fly away and abandon its nest (response). If the area is already noisy and the bird has become accustomed to urban landscape sounds (e.g., cars, industrial activities), the bird is less likely to fly away than a bird not acclimated to the urban landscape. Therefore, the response is likely to be less severe. Similarly, for a habitat to be affected, it must be both exposed to an impact causing element and have a response. For example, sediment suspension (stressor) could reduce sunlight in a nearshore habitat where aquatic vegetation occurs (exposure) resulting in reduced growth (response).

When evaluating the degree of potential impacts on biological resources, the project setting must be considered. Potential impacts can vary according to the:

- importance (i.e., legal, commercial, recreational, ecological, or scientific), or legal status, of the resource (i.e., impacts on a federally threatened or endangered species are more critical than impacts on a common species with a stable population),

- proportion of the resource that would be affected relative to its occurrence in the region and across its entire range,
- sensitivity of the resource to proposed activities (i.e., likelihood of the resource responding to a stressor), and/or
- duration of the adverse ecological effect on the resource. This can mean either the length of time the stressor continues to impart an impact on a species (e.g., project construction noise lasting one year) or the length of time the resulting impact affects an individual or population (e.g., permanent hearing loss resulting from project construction noise).

Some biological resources identified as having a chance to occur in the Action Areas are federally protected under the ESA, Marine Mammal Protection Act (MMPA), Migratory Bird Treaty Act of 1918 (MBTA), and/or the Bald and Golden Eagle Protection Act (BGEPA). Each of these federal Acts make it unlawful for the "take" of species protected under them. The term "take" is defined under each federal Act slightly differently. Incidental take is further classified to mean the unintentional, but not unexpected, take which results from a federal action but is not the purpose of the action. The analysis evaluates whether, and how, the alternatives would result in incidental take, as defined under each applicable federal law.

Take does necessarily correlate with significance of the impact. The evaluation of take in this assessment is merely a way to determine compliance with the laws and used to form the basis for whether consultations, permitting processes, or authorizations are required. For example, actions taken under the alternatives are evaluated to determine the resulting impacts on marine mammals. Consistent with the requirements of the MMPA, there is an evaluation of whether any actions under the different alternatives would constitute harassment (i.e., a form of take under the MMPA) and thus require special authorization from NMFS under the MMPA. If impacted marine mammals are also listed as threatened or endangered, then ESA consultation would also be required. For ESA-listed species and critical habitats; if adverse effects from actions under any of the alternatives are predicted but can be minimized or avoided through implementation of ECMs, mitigation measures, and/or measures provided by USFWS and NMFS; then the impacts are not likely to rise to the level of significance under NEPA.

The federal ESA defines take as meaning: "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct". The ESA prohibits "take" of ESA listed species but includes methods for allowing some take for specific federal actions as long as consultations are conducted and the federal action does not jeopardize listed species or adversely modify or destroy critical habitat. Meeting this standard requires the lead federal agency to analyze the effects of the action on species and critical habitats. Under the ESA, for an action to be considered not likely to adversely affect species or critical habitats, all impacts must be insignificant (i.e., so small they cannot be meaningfully measured, detected, or evaluated), discountable (i.e., extremely unlikely to occur), or wholly beneficial (positive effects with no associated negative). The federal action must receive the concurrence of the Services (NMFS and/or USFWS) before an action can proceed. Otherwise, a federal action is deemed "likely to adversely affect" a threatened or endangered species. This law also prohibits the "destruction or adverse modification" of critical habitat. This phrase is defined as "a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species" (50 CFR §402.02).

When a federal agency determines that an action is "likely to adversely affect" a species and/or critical habitat, formal consultation with the USFWS and/or NMFS is required. During the formal consultation process, the USFWS and/or NMFS determine whether the effects of the action would jeopardize the

continued existence of a federally listed threatened or endangered species and/or adversely modify or destroy critical habitat. If the action does not result in jeopardy or adverse modification/destruction of critical habitat, the Services issues their biological opinion (BO) with an incidental take statement that exempts the take from ESA prohibitions. The BO would include Reasonable and Prudent Measures and Terms and Conditions that the federal agency undertaking the action must comply with for the action to be lawful and consistent with the ESA. In some instances, a federal action may result in jeopardy to ESA listed species and/or adverse modification or destruction of critical habitat. In these instances, the Services will issue Reasonable and Prudent Alternatives (RPAs) to the proposed action to avoid jeopardy. The federal action agency must comply with the RPAs to be in compliance with the ESA. If the Federal agency cannot comply with the RPAs, the ESA does provide a method for appealing the RPA.

The word take is defined under the federal MMPA as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal". Harassment is defined as:

- Level A Harassment: includes "any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild".
- Level B Harassment: includes "acts that have the potential to disturb (but not injure) a marine mammal or marine mammal stock in the wild by disrupting behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering".

Incidental take of a marine mammal protected under the MMPA may be allowed through issuance of authorization (letter of authorization [LOA]or incidental harassment authorization [IHA]) depending upon the type of harassment and length of the federal action. There are processes for issuance of authorization, and federal agencies must adhere to all mitigation measures and reporting requirements issued by USFWS or NMFS with the MMPA authorization.

The federal MBTA defines take to mean pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt any of these actions, against any migratory bird, or any part, nest, or egg of such birds. Currently the incidental take of birds protected under the MBTA is prohibited. The MBTA however provides a process that allows take of protected species under specific conditions. The USFWS published an advance notice of proposed rulemaking (86 FR 54667, October 4, 2021) of their intent to develop in system for permitting incidental take of birds protected on the MBTA. When/if this process is in place, Coast Guard will follow all necessary procedures for permits, as necessary and applicable.

The federal BGEPA defines take to mean "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" a bald eagle (*Haliaeetus leucocephalus*) or golden eagle (*Aquila chrysaetos*). The term "disturb" is further defined to mean: "to agitate or bother to a degree that causes or is likely to cause…1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior". The BGEPA has a permitting process that allows for limited incidental take of bald or golden eagles.

3.6.3 Action Areas

The proposed expansion and modernization program includes three possible action alternatives. The Project area for each action alternative includes the current Base Seattle property and all properties that would be acquired under that alternative (i.e., Terminal 46, Terminal 30, MITAGS, BNSF Railway, Jack Perry Memorial Park, and Belknap). It also includes the footprint of all work to be conducted in the adjacent waterway under that alternative.

Biological impacts would occur during the construction and long-term operations phases. For the purpose of analyzing impacts on biological resources, the construction component is divided into upland activities and in-water work. The plans for upland construction are more definitive and similar in their impacts under all three alternatives, but the scope of in-water work activities varies depending upon the chosen alternative. Alternative 1 assumes that the Coast Guard would conduct an approximately 1 for 1 replacement of piles in areas 1-4 of Terminal 46. The extent and specific in-water construction activities at Piers 35 E and F under Alternatives 2 and 3 cannot be determined at this time. This is because some of the in-water activities (e.g., pile removal at Pier 35) would likely be conducted under a separate CERCLA removal action. Please refer to Chapter 4. *Cumulative Impacts* for discussion of impacts from this action together with potential CERLA removal actions at Piers 35 E and F.

Upland Action Areas. Upland construction activities are scheduled to begin in the second quarter of 2026 and continue through the first quarter of 2032. Airborne noise would likely have the most far-reaching effect on terrestrial biological resources because sound waves have the ability to travel beyond property boundaries. The extent of the effects from noise associated with this component of the program is based on the distance measured from the piece of construction equipment anticipated to generate the highest decibel (dB) level relative to 20 microPascals (re 20 µPa: the unit of measure associated with airborne noise).

The Action Area boundaries were calculated based on information provided in Section 3.6.4 to extend to the point at which the noise would fall below the behavioral disturbance threshold for federally protected birds (i.e., 90 dB re 20 µPa). That distance was determined to be 281 feet from the source (see Table 3.6-5 in Section 3.6.5) using a common noise diminishing equation adapted with an airborne sound transmission factor. This distance was applied at the property boundaries so that it would offer a conservative analysis of impacts. The distance accounts for project activities generating noise up to, and including, the boundary for each action alternative (Figures 3.6-1 to 3.6-3).

In-Water Action Area. One in-water project associated with the expansion and modernization program includes the rehabilitation of Areas 1-4 of the Terminal 46 wharf. These in-water rehabilitation activities would occur under all three action alternatives but are not anticipated to begin until the second quarter of 2030. Therefore, to better inform the decision-maker and the public, a preliminary in-water Action Area (Action Area 4) has been developed based on assumptions made regarding the activities required to rehabilitate the Terminal 46 wharf.

The reasonable assumptions included within the analysis include the following:

1) Maximum replacement of piles, decking, and infrastructure would be a 1:1 ratio.
2) Area 1: remove 95 14- to 16-inch creosote treated timber pilings and replace with approximately 85 24-inch concrete pilings, and replace 3,800 square feet of decking and related infrastructure.
3) Area 2: replace approximately 1,900 18- to 20-inch concrete piles and 150,000 square feet of decking and related infrastructure.
4) Area 3: remove 250 14- to 16-inch creosote treated timber pilings and replace with approximately 225 24-inch concrete pilings, and replace 10,000 square feet of decking and related infrastructure.
5) Area 4: replace 54 18- to 20-inch concrete piles and 6,000 square feet of decking and related infrastructure.

Similar to the upland Action Areas, noise is likely to have the most far-reaching effect on aquatic biological resources. The in-water Action Area was determined to extend to the point at which the noise would fall below the lowest behavioral disturbance threshold for federally protected species. The lowest threshold was determined to be 120 dB_{RMS} relative to 1 microPascal (re 1 µPa: the unit of measure associated with underwater noise) (see Section 3.6.4). It is based on the disturbance level set by NMFS for marine mammals in response to continuous noise. Therefore, the Action Area 4 boundary was calculated to be a distance of 18,307 feet (5,580 meters) away from the piece of in-water construction equipment anticipated to produce the highest continuous noise dB level (see Table 3.6-6). This distance was generated using a noise equation adapted with an underwater sound diminishing transmission factor.

The in-water Action Area (Figure 3.6-4) associated with rehabilitation of the Terminal 46 wharf would be the same under all three alternatives, because Areas 1, 2, 3, and 4 of the terminal wharf requiring rehabilitation are included in each property acquisition scenario. To generate a conservative analysis, the Action Area calculations did not factor in sound dampening mitigations. In addition, ambient in-water noise has been reported near the Colman Dock ferry terminal in Elliott Bay at an average level of 123 dB_{RMS} re 1 µPa (Laughlin 2011, as referenced in NMFS and USFWS 2013). This background level is above the behavioral disturbance noise threshold of 120 dB_{RMS} re 1 µPa. Therefore, once plans are finalized and mitigation measures have been determined, the size of the in-water Action Area may be reduced in size upon consultation with NMFS and USFWS.

Depending on the chosen alternative, there may be additional in-water actions performed. If Alternatives 2 or 3 are chosen, construction activities associated with Piers 35E/F would require in-water work elements not associated with the Alternative 1. The extent of in-water effects associated with Piers 35E/F cannot be defined at this time because certain preliminary aspects of the pier work may be covered under the separate CERCLA removal action (e.g., removal of existing pilings, sediment removal). The extent of effects associated with the additional in-water pier work required under Alternatives 2 and 3 is however not anticipated to extend past the currently calculated in-water Action Area delineated for the Terminal 46 wharf rehabilitation work (i.e., Action Area 4). This is because the decibel levels are not expected to exceed those anticipated for the work at Terminal 46. In addition, land formations surrounding the East Waterway would not allow for the transmittal of underwater sound further south, despite the more southerly location of proposed Piers 35E/F.

3.6.4 Affected Environment

Base Seattle and the potentially acquired properties (i.e., Terminal 46, Terminal 30, Jack Perry Memorial Park, MITAGS, BNSF Railway, Belknap) are located along the southeastern shore of Elliott Bay and along the East branch of the lower Duwamish River, also known as the East Waterway. Shoreline and deepwater habitats within the East Waterway have been highly modified by over a century of urban and industrial development. This development resulted in replacement of approximately 9.3 miles of meandering river with 5.3 miles of straightened channel. The straightening involved dredging navigation channels; filling shallow habitat, such as marshes and mud flats; and armoring nearly all of the shorelines with dikes, levees, bulkheads, and other man-made structures (King County 2001). The USACE continues to maintain the navigation channels through periodic dredging.

Figure 3.6-1 Alternative 1 Action Area (Action Area 1)

Alternative 1 Project Area
Alternative 1 Action Area
USCG Base Seattle

Alternative 1 Action Area (Action Area 1)

FIGURE
3.6-1

Figure 3.6-2 Alternative 2 Action Area (Action Area 2)

Alternative 2 Action Area (Action Area 2)

FIGURE
3.6-2

Figure 3.6-3 Alternative 3 Action Area (Action Area 3)

Alternative 3 Project Area
Alternative 3 Action Area
USCG Base Seattle

Alternative 3 Action Area (Action Area 3)

FIGURE
3.6-3

Figure 3.6-4 Terminal 46 Wharf Rehabilitation Project In-Water Action Area (Action Area 4)

Terminal 46 Wharf Rehabilitation Project
In-Water Action Area (Action Area 4)

FIGURE
3.6-4

The Project area contains, and is surrounded by, industrial/commercial properties, railroads, ports, and busy urban streets. As is typical for this type of urban environment, the program parcels are nearly completely covered with impervious surfaces, including buildings, parking lots, bulkheads, wharfs, and piers (Figure 3.6-5). As a result, there is no natural upland habitat available within the Project area. Because the Project area is so highly industrialized, the Base and surrounding properties are not likely to support large populations of terrestrial wildlife.

Terrestrial habitat is largely paved (pictured above).

Elliott Bay and the East Waterway are included as part of the Puget Sound watershed (hydrological unit code [HUC] 17110019). The remainder of the lower Duwamish River south of the East Waterway is included as part of the Duwamish watershed (HUC 17110013) (State of Washington 2022). The salt content in Elliott Bay generally ranges from 12 to 31 parts per thousand (ppt), depending upon the freshwater inputs from the Duwamish River and the time of year (King County 2017). Ocean salt content is usually above 35 ppt. Therefore, the waterways within Action Area 4 qualify as an estuary (i.e., a mixture of fresh water and salt water). The East Waterway channel bottom is composed primarily of silty sands and sandy silts deposited from the Duwamish/Green River basin (Port of Seattle 2014). The project waterfront areas (i.e., Base Seattle, Terminal 30, and Terminal 46) are contained within the boundaries of the CERCLA removal action.

The urban environment surrounding the Project area is subject to typical ambient (i.e., background) noise from a busy harbor environment. Sources of airborne noise may include horns, heavy truck noise, aircraft, and construction activities. Underwater noise from ferries, cruise ships, container ships, and other marine vessels can include the engine, propeller, acoustic devices (e.g., horns, sonars), and the interaction of waves with the vessel's hull (NMFS and USFWS 2013). Noise modeling from a nearby site indicated an ambient airborne noise level of 78 dB re 20 µPa (SDOT 2017). Ambient in-water noise has been reported within Elliott Bay at an average level of 123 dB_{RMS} re 1 µPa (Laughlin 2011, as referenced in NMFS and USFWS 2013).

General Terrestrial Resources

The following sections provide a general summary of the common terrestrial species and upland habitat associated with Action Areas 1, 2, and 3.

General Terrestrial Species. The following species are not intended to be inclusive of every species that has the potential to occur within the upland Action Areas. Instead, they are provided as a sample of some of the typical plants, birds, mammals, and invertebrates that have been identified in the area, or those anticipated to be present, which are not federally protected. Amphibians and reptiles are not expected to occur within the upland Action Areas.

Figure 3.6-5 Current Approximated Vegetation Coverage

PEIS	Current Approximated Vegetation Coverage	FIGURE 3.6-5

Terrestrial plants growing within the Project area boundaries are species that are typically found in urban environments such as weeds or common landscape trees, shrubs, or short grasses scattered around existing buildings, parking areas, roadways, or shorelines. The only properties in the Project area that contain substantial landscape vegetation include Base Seattle, Terminal 30, and Jack Perry Memorial Park (Figure 3.6-5). The plant species that have been positively identified within the upland Action Areas include the butterfly bush [*Buddelia* sp.], alder [*Alnus* sp.], and madrone [*Arbutus menziesii*]). The madrone and two species of alder are designated as native Seattle tree species under the City of Seattle's Department of Planning and Protection Directors Rule 16-2008.

Birds that use urban landscape plantings for foraging or resting, or those that would use buildings for nesting sites, are likely to be present within the three upland Action Areas. Since landscape plantings and building structures are only present within the Base Seattle, Terminal 30, MITAGS, and Jack Perry Memorial Park properties, it would likely limit the presence of most birds to these four properties. Species such as the European starling (*Sturnus vulgaris*), song sparrow (*Melospiza melodia*), house finch (*Haemorhous mexicanus*), house sparrow (*Passer domesticus*), American robin (*Turdus migratorius*), and American crow (*Corvus brachyrhynchos*) have been documented within the southwest portion of inner Elliott Bay (USACE 1994). Other common shore birds and sea birds to the Puget Sound area would also be expected, such as gulls (e.g., glaucous-winged gull [*Larus glaucescens*]) and ducks (e.g., bufflehead [*Bucephala albeola*]). Many sea birds may be found resting or foraging on the water within the upland Action Areas, and they would not use the land for breeding or nesting.

There are a number of bird species that are considered a Bird of Conservation Concern that may occur in the area. These include black oystercatcher, black swift, black turnstone, Cassin's auklet, Clark's glebe, evening grosbeak, lesser yellowlegs, marbled godwit, olive-sided flycatcher, Rufous hummingbird, short-billed dowitcher, tufted puffin, western grebe. The presence of these species is dependent on time of year, with most more commonly occurring in the spring and summer (USFWS, 2022). Other common bird species are great blue heron, black brant, bufflehead, common goldeneye duck, green heron, least sandpiper, pigeon guillemot, belted kingfisher, common loon, red-billed gull, surf scoter, common merganser, double-crested cormorant, horned grebe. Raptors that may occur in the area seasonally include peregrine falcon, Cooper's hawks, merlins, and osprey. Bald eagles may be year round residents, but numbers generally fluctuate throughout the year with higher abundance in the spring and summer. Diving bird species, e.g., pigeon guillemots, auklets, surf scoters, "fly" underwater in search of food and thus may be more susceptible to acoustic impacts than terrestrial or other sea birds, but impacts are expected to be minimal since the majority of time is spent at the surface.

Mammalian use of Base Seattle and the adjacent acquisition properties would be limited to those species that have adapted to living in areas affected by frequent human disturbance. Rodents, such as the Norway rat (*Rattus norvegicus*), black rat (*Rattus rattus*), or house mouse (*Mus musculus*) are the mammalian species most likely to be found nesting in buildings or other manmade structures within the upland Action Areas. This would likely limit the presence of mammals to predominantly Base Seattle and the MITAGS property. Although the river otter (*Lontra canadensis*) does not use the upland portion of the Action Areas, they may be found foraging in the adjacent Action Area waterways. Despite their similarities to the sea otter (*Enhydra lutris*), the river otter is not federally protected under the federal MMPA.

There are also numerous ground dwelling and flying terrestrial invertebrates that have the potential to be present within the three upland Action Areas. More common species that may occur in such an urban environment include ants, flies, spiders, and moths. Like birds, they are most likely to use urban

landscape plantings and building structures for foraging and nesting. Some invertebrates however live underground (ground-dwelling).

General Terrestrial Habitat. The only terrestrial habitat available in or near the Project area includes urban landscape plantings scattered around existing buildings, parking lots, or along nearby roadsides and railroad tracks. Intermittent shoreline grasses, shrubs, or ruderal (i.e., disturbed area) weeds are also present. As stated above, the only properties that contain substantial landscape plots include Base Seattle, Terminal 30, and Jack Perry Memorial Park (Figure 3.6-5). The closest unmodified terrestrial habitat is approximately 0.8 mile to the east of Base Seattle and is associated with Dr. Jose Rizal Park and the Mountains-to-Sound Greenway Trail. None of the upland habitat present within Action Areas 1, 2, or 3 is federally protected as critical habitat.

General Aquatic Resources

The following section provides a general summary of the common aquatic species associated with Action Area 4. All aquatic habitat in Action Area 4 is protected under the federal ESA and MSA and is described further in the Federally Protected Habitat section below.

General Aquatic Species. The following species list is not intended to be inclusive of every species that has the potential occur within Action Area 4. Instead, they are provided as a sample of some of the typical fish and aquatic invertebrates that have been identified or are anticipated to be present in the area and are not federally protected. Submerged aquatic vegetation (SAV) is not mapped by the Washington Department of Natural Resources (WDNR) as being present near the Project area (WDNR 2022). Previous site surveys confirmed the lack of marine vegetation in the current vessel berthing area at Base Seattle (Coast Guard 2001). Therefore, aquatic plant species are not anticipated to be present in or near the Terminal 46 wharf rehabilitation footprint.

The Elliott Bay/Duwamish River estuary serves as important habitat for many fish species belonging to multiple classes or ecological guilds within the estuarine ecosystem. This is based upon discrete in-situ parameters such as feeding behavior, habitat preferences, niche quality. The presence and abundance of different fish species may vary depending on time of year and oceanographic conditions. In 2016, the warm water off the west coast of the U.S. caused large areas of higher than normal sea surface temperatures and sighting of typically warm water species in the Puget Sound. Ocean conditions can also affect the survival rates of salmon and thus influence returns. Shiner perch (*Cymatogaster aggregata*) were documented as the most dominant species in the lower Duwamish River (3,446 individuals counted) in a survey conducted in August and September of 2017 (LDWG 2018). Other notable species included English sole (*Parophrys vetulus*), longfin smelt (*Spirinchus thaleichthys*), Pacific cod (*Gadus macrocephalus*), starry flounder (*Platichthys stellatus*), and staghorn sculpin (*Artedius lateralis*). Overall, 21 different fish species were identified during this study. Additional fish species reported in the general vicinity but not identified in 2017 include dogfish (*Squalidae* sp.), hake (*Merluccius productus*), tomcod (*Microgadus proximus*), and walleye pollock (*Theragra chalcogramma*) (Meyer et al. 1981). Fishes found in Puget Sound also include a variety of sharks (e.g., dogfish and six-gill), skates, herring, sardines, anchovy, trout, many species of rockfish, and sculpin. See Pietsch and Orr, 2015 for additional details. Action Area 4 also includes a Washington StateState identified and regulated octopus reserve near Alki Beach (WAC 220-33-180(2)(c)).

Less is known regarding the aquatic invertebrates residing within Elliott Bay and the lower Duwamish River. Such communities can vary widely in an estuarine system (U.S. Coast Guard 2006). Artificial landforms, such as pilings and docks, often attract unique benthic communities. Invertebrate species

common in these areas include anemones (*Monactis* spp.), sea stars (*Pisaster ochraceus* and *Pycnopodia helianthoides*), tubeworms (e.g., *Eudistylia vancouveri*), and sponges (*Halichondria panicea*) (Kozloff 1993, LDWG 2018). Other invertebrates that may be present within the intertidal zone (i.e., area submerged during high tide and exposed during low tide) include barnacles, mussels, several types of snails, shrimp, and sea squirts. Some of the larger invertebrates harvested commonly within the lower Duwamish River include crabs, such as red rock crab (*Cancer productus*), Dungeness crab (*Metacarcinus magister*), and slender crab (*Metacarcinus gracilis*); clams, such as eastern softshell clam (*Mya arenaria*) and cockles (*Cardiidae* spp.); mussels; and spot prawn (*Pandalus platyceros*) (Windward Environmental, LLC 2016, Public Health – Seattle and King County n.d.). The most dominant invertebrate species collected in the 2017 Lower Duwamish Waterway Group (LDWG) study included 845 individual unidentified shrimp and 773 graceful crabs (*Metacarcinus gracilis*) (LDWG 2018). There are over 1,800 taxa of benthic infaunal invertebrates in Puget Sound, as described in the Washington State Department of Ecology's Marine Sediment Monitoring Program. A full list of marine invertebrates can be found in Kozloff (1974).

Previous sampling conducted at Slip 27, located south of Terminal 30 within the East Waterway of the Duwamish River, identified more than 100 species of invertebrates, of which 21 were classified as juvenile salmon prey (Taylor et al. 1999, U.S. Coast Guard 2006).

Federally Protected Resources

There are several federal, state, and local laws, rules, and/or guidelines that have been established to help protect the most vulnerable species, species during certain critical life stages, and critical species habitat. The federal ESA, MMPA, BGEPA, MBTA, and MSA are the applicable federal laws affording protection to specific biological resources anticipated to be present within the Action Areas. Appendix F provides a comprehensive summary of these and other relevant laws and regulations for which the proposed modernization program has been evaluated.

State and Federally Protected Species. Table 3.6-1 provides a list of protected species that have the potential to occur, and are expected to occur, within the Action Areas throughout the duration of the expansion and modernization program at Base Seattle. The table includes both their current federal and State of Washington listing status, as well as the frequency of occurrence within the Action Areas. Detailed life histories for the species listed in Table 3.6-1 are presented in Appendix M.

The list was developed by reviewing information provided by USFWS on their IPaC website (USFWS 2022), the NOAA Fisheries Protected Resources App (NOAA Fisheries 2022a), the NOAA Fisheries Species Directory pages (NOAA Fisheries 2022b), and other available online sources. In May and June 2021, official species and habitat requests were submitted to the USFWS, NMFS, and WDFW. An updated request was submitted to USFWS in March 2022. Copies of the species requests and concurrence (where received) are included in Appendix H.

Many marine mammal species have been observed in Puget Sound including various species of beaked whales, large whales (Bryde's and fin whales), false killer whales and pilot whales, and numerous dolphin species (e.g., bottlenose, Risso's, striped) (Gaydos and Pearson, 2011). None of these are considered commonly occurring in the Action Areas. Any species that may occur in the greater Seattle or Puget Sound region but are not listed below (e.g., fin whales [*Balaenoptera physalus*]), are assumed to be either absent or extremely rare in the Action Areas. The absence of marine mammals, for example, has been confirmed through recent documentation for Elliot Bay (City of Seattle 2021a, City of Seattle 2021b).

Many bird species may occur in the action areas, in water, especially in Action Area 4. Some terrestrial bird species are also likely to occur, as described above. Using the results of the iPac output and other resources on bird species in the Puget Sound area, dozens of birds protected under the MBTA may occur in the area at various times of the years. The impacts on birds are expected to vary based upon their natural history. For convenience, bird species are grouped into broad categories to evaluate, such as diving (all alcids), shoreline (heron, cormorants), gulls and terns (associated with water and land), raptors (generally terrestrial, but will fish on water), and song birds (sparrows and finches which are solely terrestrial).

Any species that was identified as having the potential to occur by the USFWS in their March 2022 correspondence noted above, but are not expected to occur due to lack of suitable habitat, are not presented below because project activities would not result in direct or indirect effects for those species. Detailed life histories for these species, however, are presented in Appendix M to document the reasoning for exclusion.

Table 3.6-1 Protected Species Within the Action Areas and Their Status, Occurrence, and Applicable Federal Laws of Protection

Species	Federal Status	State Status[a]	Occurrence	Applicable Action Area(s)	Time of Year Expected	Applicable Federal Law
Birds*						
Marbled murrelet (Brachyramphus marmoratus)	T	E	Uncommon	1, 2, 3 and 4	Year-round	ESA MBTA
Bald eagle (Haliaeetus leucocephalus)	NL	NL	Expected to Occur	1, 2, and 3	Year-round	MBTA BGEPA
Fish						
Bull trout (*Salvelinus confluentus*)	T	C	Expected to occur	4	Year-round	ESA
Chinook salmon, Puget Sound ESU (*Oncorhynchus tshawytscha*)	T	NL	Expected to occur	4	August to November (Adults) April to July (Juveniles)	ESA
Steelhead trout, Puget Sound DPS (*Oncorhynchus mykiss*)	T	C	Expected to occur	4	Year-round	ESA
Bocaccio, Puget Sound/Georgia Basin DPS (*Sebastes paucispinis*)	E	NL	Rare	4	March to October	ESA
Yelloweye rockfish, Puget Sound/Georgia Basin DPS (*Sebastes ruberrimus*)	T	NL	Rare	4	Year-round	ESA
Marine Mammals						
Killer whale, Southern Resident DPS (*Orcinus orca*)	E	E	Common fall and winter, Uncommon rest of year	4	September to May, but may be year-round	ESA MMPA
Killer whale, Transient Stock	NL	NL	Expected to occur	4	Year-round	MMPA

Species	Federal Status	State Status[a]	Occurrence	Applicable Action Area(s)	Time of Year Expected	Applicable Federal Law
Humpback Whale, Mexico DPS (*Megaptera novaeangliae*)	T	E	Uncommon	4	Year-round	ESA MMPA
Humpback Whale, Central America DPS	E	E	Uncommon	4	Year-round	ESA MMPA
Humpback whale, Hawaii DPS	NL	NL	Uncommon	4	Year-round	MMPA
Gray whale, Eastern North Pacific Stock (*Eschrichtius robustus*)	NL	NL	Uncommon	4	March to May	MMPA
Minke whale (*Balaenoptera acutorostrata*)	NL	NL	Rare	4	Year-round	MMPA
Harbor seal (*Phoca vitulina*)	NL	NL	Expected to occur	4	Year-round	MMPA
Northern elephant seal (*Mirounga angustirostris*)	NL	NL	Rare	4	November to March	MMPA
California sea lion (*Zalophus californianus*)	NL	NL	Expected to occur	4	Year-round	MMPA
Steller sea lion (Eastern DPS) (*Eumetopias jubatus*)	NL	NL	Uncommon	4	Year-round	MMPA
Dall's porpoise (*Phocoenoides dalli*)	NL	NL	Uncommon	4	Year-round	MMPA
Harbor porpoise (*Phocoena phocoena*)	NL	C	Expected to occur	4	Year-round (May to June peak)	MMPA
Long-beaked common dolphin (Delphinus capensis)	NL	NL	Uncommon	4	Year-round	MMPA
Bottlenose dolphin (Tursiops truncatus)	NL	NL	Uncommon	4	Year-round	MMPA

Notes:
DPS = Distinct Population Segment T = Threatened
ESU = Evolutionarily Significant Unit E = Endangered
C = Candidate NL = Not Listed
*Due to the number of MBTA bird species in the area, unless a bird species is protected under another law (ESA, BGEPA, etc.), it is not included within this table.
a = Status for species listed as threatened, endangered, or sensitive within the State of Washington by the WDFW.
Sources: NOAA Fisheries 2022a, NOAA Fisheries 2022b, USACE and WDFW 2016, WDFW 2020, U.S. Coast Guard 2006, Tetra Tech, Inc. 2012, WDFW 2022, City of Seattle 2021a, City of Seattle 2021b

Federally Protected Habitat. All nearshore and deepwater aquatic habitat within Action Area 4 has been designated as critical habitat for certain threatened and endangered species. Critical habitat is designated by USFWS and NMFS and is protected under the federal ESA. Table 3.6-2 presents a list of the federally protected species with critical habitat mapped within Action Area 4 as well as the total extent of their critical habitat coverage. Figure 3.6-6 depicts the designated critical habitat mapped within the Project area for these species. The physical and biological features associated with each species' designated critical habitat are included in Appendix M.

Table 3.6-2 Critical Habitat Mapped Within the Action Areas

Species	Critical Habitat	Total Amount of Critical Habitat for the Species
USFWS Jurisdiction		
Bull trout	Designated in Action Area 4 (nearshore only)	19,729 linear miles of streams; 763 square miles of reservoirs and lakes
NMFS Jurisdiction		
Chinook salmon, Puget Sound ESU	Designated in Action Area 4 (nearshore and deepwater)	All marine, estuarine, and river reaches accessible to listed Chinook salmon in Puget Sound (includes South Sound, Hood Canal, and North Sound to the international boundary)
Steelhead trout, Puget Sound DPS	Designated in Action Area 4 (deepwater only)	2,031 linear miles of freshwater and estuarine habitat
Bocaccio, Puget Sound/Georgia Basin DPS	Designated in Action Area 4 (deepwater only)	590 square miles of nearshore habitat; 414 square miles of deepwater habitat
Yelloweye rockfish, Puget Sound/Georgia Basin DPS	Designated in Action Area 4 (deepwater only)	414 square miles of deepwater habitat
Killer whale, Southern Resident DPS	Designated in Action Area 4 (nearshore and deepwater)	15,910 square miles of marine habitat

*Although Action Areas 1, 2, and 3 include marine waters of Puget Sound, all activities would occur on land and therefore not affect in-water critical habitat. Only the future actions planned and described in Action Area 4 would affect in-water critical habitat.

The nearshore habitats (between 0 and -45 feet MLLW) within Action Area 4 are federally protected as critical habitat for the bull trout, Chinook salmon, and southern resident killer whale (SRKW). This habitat has been significantly modified from natural conditions and is composed largely of piers and wharfs. Bulkheads have also been established to maintain structural stability. The overwater wharf structures within the Project area are composed typically of concrete decks and supported by thousands of concrete or timber pilings. Timber pilings have been treated with creosote to prevent damage by wood-boring marine organisms. Creosote contains hazardous chemicals such as polycyclic aromatic hydrocarbons (PAHs), phenols, and creosols. Nearshore habitat present under each wharf is anticipated to be primarily an open silty sand or sandy silt bottom with no presence of aquatic plants due to lack of sunlight penetration. A small section of the current Base Seattle property (approximately 0.4 acres), located south of the small boat lift, contains nearshore intertidal habitat that is not shaded by wharf or pier structures. The area has also been modified from its natural state because the banks are armored with riprap (i.e., rock material) for stabilization.

Federally protected deepwater habitat elevations within Action Area 4 range between -45 and -55 feet MLLW into the central navigation channel. These areas are federally protected as critical habitat for the Chinook salmon, SRKW, steelhead trout, bocaccio, and yelloweye rockfish. Deepwater habitat is anticipated to be primarily open silty sand or sandy silt bottoms with no aquatic plants anticipated due to the depth of water, intermittent dredging, and constant churning of the sediment bottom from ship propellors.

The East Waterway and Elliott Bay are also designated as Essential Fish Habitat (EFH) by NMFS and managed under the following three fishery management plans (FMP):

- Pacific Coast Salmon FMP,
- Pacific Coast Groundfish FMP, and
- Coastal Pelagic Species FMP.

As shown in Table 3.6-3, the estuarine waters within Action Area 4 is also a Habitat Area of Potential Concern (HAPC) for groundfish and Pacific coast salmon. A HAPC is an area within EFH that is considered high priority areas for conservation, management, or research due to their importance to the ecosystem in which they are found. HAPCs are a discrete subset of EFH.

Although eelgrass (*Zostera marina*) and kelp beds are scattered throughout the nearshore areas in Elliott Bay, the closest mapped eelgrass bed within Action Area 4 is located approximately 2.0 miles to the west along Alki Beach Park. The closest mapped kelp beds occupy nearshore areas approximately 0.32 miles north of Terminal 46. There are no mapped surfgrass (*Phyllospadix* spp.) areas within Action Area 4 (WDNR 2022). Although SAV is an element that is common to HAPCs for groundfish and salmon, it is not anticipated, or currently found, within the Project area footprint.

3.6.5 Environmental Consequences of the Action Alternatives

The analysis within this PEIS focuses specifically on the biological resources that are expected to occur within the defined Action Areas and, therefore, have the potential to be affected by project components. Table 3.6-4 presents a summary of the project elements that have the potential to cause direct adverse impacts to biological resources under all three action alternatives.

Land Acquisition

The land acquisition component would not result in any changes to land use or result in physical alterations to the properties acquired under each action alternative. Although the purchase of adjacent lots would result in the eventual displacement of existing personnel, equipment, and operations on these properties, these features would be replaced by Base personnel, equipment, and operations over time.

Overall, the acquisition of adjacent properties would have no impact (i.e., no effect) on biological resources, including those protected under the ESA, MBTA, BGEPA, or MSA.

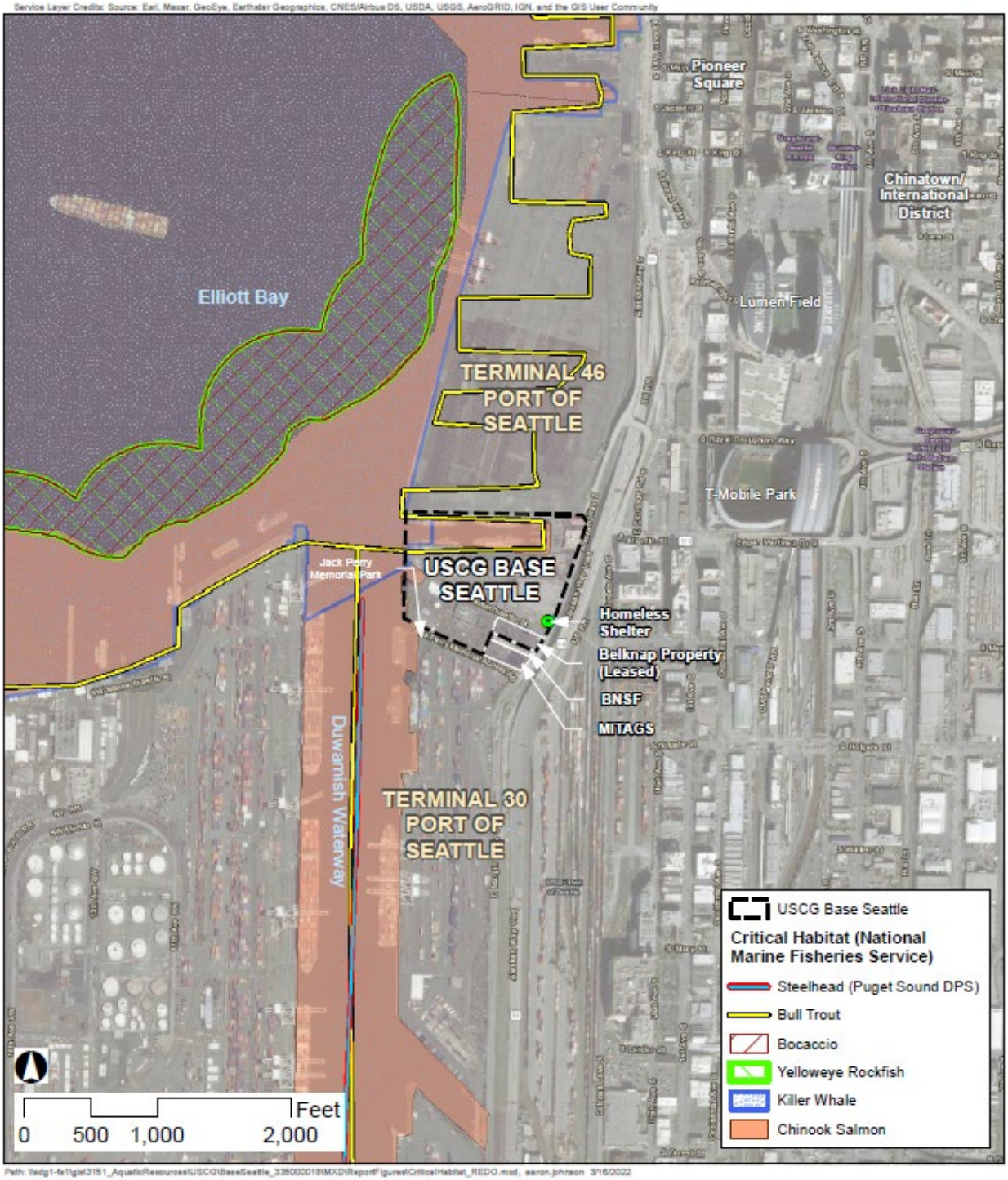
Construction

The construction component is composed of both upland activities and in-water work elements. The impact mechanisms, associated stressors, and anticipated impacts on biological receptors resulting from each phase are described separately below.

Upland Construction. Upland construction activities (i.e., clearing and grading, installation of seismic stabilization measures, use of power tools and heavy equipment, and the storage or stockpiling of soil/construction materials) may result in the following stressors that have the potential to adversely impact various wildlife species and habitats present within the Action Areas:

- Airborne noise/ground vibration,
- Terrestrial vegetation removal,
- Land equipment movement, and
- Exposure to hazardous chemicals/runoff.

Figure 3.6-6 Critical Habitat on or Near Base Seattle



PEIS	Critical Habitat On or Near Base Seattle	FIGURE 3.6-6

Table 3.6-3 List of EFH Factors and HAPC for Species Protected Under the Federal MSA

Species FMP	HAPC	EFH Factors	Features Present in Action Area 4
Groundfish (includes over 100 species)	Estuaries Canopy Kelp Seagrass Rocky Reefs	All waters less than 3,500 meters (11,483 feet) deep upstream and landward to the point where ocean-derived salts measure less than 0.5 ppt during average annual flow Seamounts in depths greater than 3,500 meters deep Areas designated as HAPCs which are not included in the above criteria	EFH waters less than 3,500 meters with ocean-derived salts measured at 12 to 31 ppt Estuary HAPC Specific Area of Interest in Washington = waters and sea bottoms located in state waters, shoreward from the three-nautical mile boundary of the territorial sea (i.e., exclusive economic zone [EEZ] to the MHHW
Pacific Coast Salmon (includes Chinook salmon, coho salmon [*Oncorhynchus kisutch*], and pink salmon [*Oncorhynchus gorbuscha*)]) and chum salmon (*Oncorhynchus keta)*	Complex channels and floodplain habitats Thermal refugia Spawning habitat Estuaries Marine and estuarine SAV	Estuarine and marine EFH = all coastal waters from the extreme high tide line within state territorial waters to the EEZ Freshwater EFH = watersheds known to currently or historically be inhabited by managed salmon species	Estuarine and Marine EFH Estuary HAPC
Coastal Pelagic Species (includes northern anchovy [*Engraulis mordax*], Pacific sardine [*Sardinops sagax*], Pacific mackerel [*Scomber japonicus*], jack mackerel [*Trachurus symmetricus*], and krill)	None listed	All estuarine and marine waters from the shoreline along the coast of CA, OR, and WA offshore to the limits of the EEZ, and above the thermocline where sea surface temperatures range between 10 and 26 degrees Celsius (°C).	EFH waters ranging between 10 and 26°C from June to November (SeaTemperature.org 2022).

Airborne Noise/Ground Vibrations. Airborne noise is the most far-reaching program-related stressor associated with upland construction activities. Airborne noise and ground vibrations above background levels are likely to result from various project activities, including excavation and grading, seismic stabilization of the property, and the use of power tools and heavy equipment for the demolition, construction, and renovation of buildings. These stressors have the potential to impact the following biological resources with the capability of being exposed (i.e., terrestrial receptors that have a sense of hearing and touch) within the boundaries of the upland Action Areas:

- Terrestrial birds (including bird species protected under the federal MBTA, BGEPA, and ESA),
- Terrestrial mammals , and
- Terrestrial invertebrates.

Marine mammals protected under the federal MMPA that haul-out onto land (i.e., seals and sea lions) would not be exposed to airborne noise for a long enough period of time to be impacted (i.e., only during surface breathing intervals), because there are no haul-out sites documented in or near the upland Action Areas (see Figure 3.6-7).

Project activities would occur along a busy industrial waterway that is routinely subject to airborne noise and ground vibrations generated from human activities. Ambient noise modeling conducted for a nearby site reported noise levels ranging up to 78 dB. This value is considered the airborne background noise level for this project. Noise levels generated as a result of upland construction activities may reach as high as 105 dB measured at 50 feet from the source (Table 3.6-5). All airborne noise levels described in this section are referenced to 20 µPA. See Section 3.9.4 for more information and references regarding these values.

Noise can impact a species by inducing physical injury (e.g., hearing loss) and/or causing behavioral disturbances. Noise threshold levels have been established for some species based on both injury and anticipated behavioral effects. Peak sound levels that are reported as causing injury in birds are above 140 dB (Dooling and Popper 2007). Although most man-made sounds are not intense or persistent enough to cause physical harm to terrestrial mammals, studies have shown that noise levels above 120 dB can cause damage to their ears (Slabbekoorn et al. 2018, Noise Quest 2022). Noise levels that may cause injury to terrestrial invertebrates have not been well studied. These animals are expected to react more to the vibrations caused by sound than by the intensity of the noise itself (Raboin 2021). Therefore, the maximum noise level of 105 dB generated by upland construction activities is not anticipated to physically harm any biological resources. As a result, only behavioral reactions are anticipated.

The marbled murrelet has an established behavioral noise impact threshold of 90 dB. This level is considered the benchmark for the onset of behavioral changes for all terrestrial species. Based on the expected maximum airborne noise level of 105 dB, the distance sound would travel to render a noise level below the 90 dB threshold was calculated to be 281 feet (see Table 3.6-5). This distance is the basis for upland Action Areas boundaries being set at 281 feet from the property boundaries.

Behavioral responses to sound and vibrations may be highly variable, diverse, and complicated depending on the situation. Responses can range from subtle changes in behavior (e.g., startling or waking from a resting state) to more dramatic changes in activities (e.g., stop foraging, discontinue feeding young, or displacement from a nest) (NMFS 2019a, Raboin 2021). For some terrestrial invertebrates, changes in ground vibrations can potentially lead to reduced food ingestion rates or missing vital information between individuals, such as an alert of a predatory species in the area (Wu and Elias 2014).

Based on the urban industrial landscape, most terrestrial species that occur within the upland Action Areas are expected to be accustomed to airborne noise and ground vibrations associated with upland construction activities. Therefore, these animals would experience no impact. Certain individuals may however not be acclimated to ambient background noise. The expected behavioral response from these individuals is movement away from the Action Area to similar nearby habitat. They are expected to either remain in their new location or return to the selected alternative's Action Area shortly after the upland construction component is finished.

Table 3.6-4 Summary of Potential Direct Adverse Impacts on Biological Resources

Potential Stressors	Potentially Impacted Resources	Associated Impact Causing Element(s)[a]	Expected Response to Potential Stressor(s)	Maximum Impact Analysis	Impact Length	Impact Type	Reasoning
Upland Construction							
Land Equipment Movement	General Terrestrial Species (Birds, Mammals, and Invertebrates only)	1, 2, and 3	Animals may avoid equipment.	Minor	Short-Term (Approximately 6 years)	Direct	The project is located within industrialized parcels currently subject to many vehicular/mechanical movements. Terrestrial animals may be acclimated to living with such distractions. Birds, mammals, and flying invertebrates have the ability to move away from the equipment to avoid being struck. Although some ground dwelling invertebrate individuals may be lost, they are common species and the viability of their population would not be impacted. Vehicles would be restricted to existing roads/paths, parking areas, and authorized construction areas.
	Federally Protected Species (MBTA-, and BGEPA-listed Birds only)			No take under the MBTA or BGEPA			The project is located within industrialized parcels currently subject to many vehicular/mechanical movements. Birds protected under the federal MBTA/BGEPA have the ability to move away from land equipment to avoid being struck. Some ground dwelling invertebrates may be lost, but this would have no effect bird species likely to be at the site because there is no indication of birds foraging on these species. In addition, nesting bird surveys would be conducted to avoid disturbing birds protected under the MBTA/BGEPA and activities would be planned to avoid known bird nesting seasons. Vehicles would be restricted to existing roads/paths, parking areas, and authorized construction areas. The federal ESA-listed marbled murrelet would not be affected as it would not occur on land within the Action Areas.
Removal of Terrestrial Vegetation	General Terrestrial Resources	1 and 2	Animals may relocate to a nearby area that has similar vegetation available that can provide the same benefits. Plants have no way to respond.	Minor	Short-Term (Approximately 6 years)	Direct	The permanent loss of some existing landscape habitat, including individual trees/shrubs/grasses, would occur. They are common species and would be replaced with new landscape plantings. The use of only native plants may be incorporated into the landscape design. The introduction of invasive or non-native weeds may also be mitigated. Nesting bird surveys would be conducted to avoid removing active nests. If nests must be removed, the Coast Guard would follow MTBA requirements and ensure the nests are not active. New landscape designs may have long-term benefit of creating improved habitat quality over existing conditions
	Federally Protected Species (MBTA- and BGEPA-listed Birds only)		Animals may relocate to a nearby area that has similar vegetation available that can provide the same benefits.	No take under the MBTA or BGEPA			The permanent loss of some existing landscape trees/shrubs/grasses would occur. They are common species and be replaced with new landscape plantings. The use of only native plants may be incorporated into the landscape design. The introduction of invasive or non-native weeds may also be minimized through implementation of ECMs. Nesting bird surveys would be conducted prior to tree/shrub removal to avoid removing nests or disturbing birds protected under the MBTA/BGEPA. New landscape designs may have long-term benefit of creating improved habitat quality over existing conditions. The federal ESA-listed marbled murrelet would not be affected as it does not use the type of terrestrial habitat present within the upland Action Areas.
Airborne Noise/ Ground Vibrations	General Terrestrial Species (Birds, Mammals, and Invertebrates only)	1, 2, and 3	Animals may avoid loud equipment.	Minor	Short-Term (Approximately 6 years)	Direct	Project activities to occur along a busy industrial waterway that is routinely subject to human activities that generate noise and vibrations. Terrestrial animals present within the selected alternative's Action Area may be accustomed to these disturbances and/or may move to areas outside the noise disturbance threshold area. Surveys would be conducted for the presence of nesting birds. Airborne noise is not anticipated to reach the level of causing physical injury.
	Federally Protected Species (MBTA-, BGEPA-, and ESA-listed Birds only)			No take under the MBTA or BGEPA; NLAA the marbled murrelet under the ESA			Project activities to occur along a busy industrial waterway that is routinely subject to human activities that generate noise and vibrations. Federally protected species present within the selected alternative's Action Area may be used to these disturbances and/or may move to areas outside the noise disturbance threshold area. These movements would not significantly disrupt important behaviors, such as feeding, resting, or sheltering. Responses would also not disrupt nesting, reproduction, or rearing young behavior for two reasons 1) the closest nesting habitat for the marbled murrelet is >27 miles away and 2) surveys would be conducted for the presence of nesting migratory birds. Airborne noise is not anticipated to reach the level of causing physical injury.
Exposure to Hazardous Chemicals/ Runoff	General Terrestrial and Aquatic Resources	1, 2, 3, and 4	Animals may avoid contaminated areas.	Minor	Short-Term (Approximately 6 years)	Direct	Project activities to occur in an urban environment that is subject to many hazardous waste sources. Hazardous soils/construction debris/chemical spills (e.g., grout) would be removed as soon as possible in accordance with all applicable federal, state, and local laws. Exposed soil may be temporarily covered with plywood, sheet metal, or similar material to reduce the likelihood of exposure. An SPCC Plan would be prepared to ensure that land-based spills would not migrate to landscape areas with vegetation. Runoff to the adjacent waterway would be minimized through implementation of a SWPPP. Federal CWA) permits would be obtained. No reduction of water quality is anticipated.

Potential Stressors	Potentially Impacted Resources	Associated Impact Causing Element(s)[a]	Expected Response to Potential Stressor(s)	Maximum Impact Analysis	Impact Length	Impact Type	Reasoning
Upland Construction							
Exposure to Hazardous Chemicals/ Runoff	Federally Protected Species	1, 2, 3, and 4	Animals may avoid contaminated areas.	No take under the MBTA, BGEPA or MMPA; NLAA birds, fish or marine mammals under the ESA	Short-Term (Approximately 6 years)	Direct	Project activities to occur in an urban environment which is subject to many hazardous waste sources. Hazardous soils/construction debris/chemical spills (e.g., grout) would be removed as soon as possible in accordance with all applicable federal, state, and local laws. Exposed soil may be temporarily covered with plywood, sheet metal, or similar material to reduce the likelihood of exposure. Runoff to the adjacent waterway would be minimized through implementation of a SWPPP. Federal CWA permits would be obtained. No reduction of water quality is anticipated.
	Federally Protected Critical Habitat and EFH		No expected response.	NLAA			Runoff to the adjacent waterway would be minimized through implementation of a SWPPP. No measurable reduction of water quality is anticipated. Federal CWA permits would be obtained. No changes in water quantity, salinity, temperature, sediment composition, etc. would occur.
In-Water Construction							
Pile Driving/Removal	General Aquatic Species	5	Animals may avoid turbid areas.	Minor	Sediment Suspension: Short term (Approximately 1 Year); Habitat Loss: Long-Term	Direct	Pile driving/removal can result in sediment suspension (short-term) and loss of aquatic habitat which have the potential to impact aquatic species through sediment deposition, reduced ability to forage, and exposure to underlying hazardous chemicals. Most aquatic species however have the ability to move to nearby estuarine habitat outside the sediment plume. Low numbers of less-mobile aquatic invertebrates are expected in or near the T-46 wharf rehabilitation footprint. Although some individual invertebrates may be lost, they are common species, and the viability of their population would not be impacted. No SAV is expected. Sediment plumes are likely to be less than 300 feet in radius from each pile. In-water project elements are anticipated to occur after the CERCLA removal of contaminated sediments associated with the East Waterway are complete. Mitigation measures would also be implemented as needed.
	Federally Protected Aquatic Species (ESA-, and MMPA-listed species only)			Incidental take for marine mammals under the MMPA[a]; LAA marine mammals and fish under the ESA[b]			Pile driving/removal can result in sediment suspension and the loss of nearshore critical habitat and EFH (see below) and have the potential to impact federally protected fish and marine mammal species through sediment deposition, reduced ability to forage, and exposure to underlying hazardous chemicals. These species have the ability to move to nearby estuarine habitat outside the sediment plumes. In addition, in-water project elements are anticipated to occur after the CERCLA removal action is complete. Mitigation measures would be employed for federally protected species to minimize impacts to the extent possible.
	Federally Protected Critical Habitat and EFH		No expected response.	LAA of bull trout, Chinook salmon, and SRKW critical habitat under the ESA;NLAA[b]NLAA of bocaccio, yelloweye rockfish, or steelhead trout critical habitat under the ESA; LAA[b] of EFH under the MSA			Federally designated nearshore EHF for groundfish and salmon and critical habitat for bull trout, Chinook salmon, and SRKW may be lost or damaged from replacement of 14- to 16-inch timber pilings with 24-inch concrete pilings. The benefit of removing creosote may offset some, if not all of the loss. Habitat may also be impacted through sediment deposition and exposure to underlying hazardous chemicals. In-water project elements are however anticipated to occur after the CERCLA removal action is complete. Mitigation measures would be implemented as needed to help reduce impacts. No measurable reduction of water quality is anticipated and no changes in water quantity, salinity, temperature, sediment composition, etc. would occur. The Coast Guard would consult with NMFS on ESA and EFH to reduce the impacts on critical habitat and EFH. This may be accomplished through such things as adjusting design plans, purchasing conservation credits, or funding an offsite habitat restoration.
Underwater Equipment Movement	General Aquatic Species	5	Animals may avoid pile-driving equipment.	Minor	Short-Term (Approximately 1 year)	Direct	Project activities to occur along a busy industrial waterway subject to many vessel movements and construction activities. Most aquatic species have the ability to move away from pile-driving activities to avoid being struck. Low numbers of sediment dwelling invertebrates are expected in or near the T-46 wharf rehabilitation footprint. Although some individual invertebrates may be lost, they are common species, and the viability of their population would not be impacted. No SAV is expected. Mitigation measures may also be implemented to help aquatic animals avoid strikes.

Potential Stressors	Potentially Impacted Resources	Associated Impact Causing Element(s)[a]	Expected Response to Potential Stressor(s)	Maximum Impact Analysis	Impact Length	Impact Type	Reasoning
	Federally Protected Aquatic Species (ESA (e.g., salmon)-, and MMPA-listed species only)			No harassment under the MMPA[b]; NLAA marine mammals or fish under the ESA[b]			Project activities to occur along a busy industrial waterway subject to many vessel movements and construction activities. Federally protected aquatic species have the ability to move away from pile-driving activities to avoid being struck. Although some individual invertebrates may be lost, they are common species within Action Area 4 so federally protected species that feed on them would not be affected by the negligible loss. No loss of SAV is expected. Mitigation measures, including construction windows, may also be implemented to help aquatic animals avoid strikes.
In-Water Construction							
Underwater Noise/ Sediment Vibration	General Terrestrial Species and General Aquatic Species	5	Animals may avoid pile-driving equipment.	Minor	Short-Term (Approximately 1 year)	Direct	Project activities to occur along a busy industrial waterway that is routinely subject to in-water construction and vessel noise/vibrations. Aquatic species, and terrestrial species that may forage under water, may be habituated to such disturbances and/or may move away from the pile-driving activity to avoid impacts. Noise levels are not anticipated to surpass injury thresholds for birds, river otters, or fish. Mitigation measures may be implemented to help reduce impacts.
	Federally Protected Species (ESA-, MBPA-, and MMPA-listed species only)			Harassment of marine mammals under the MMPA[b]; LAA fish and marine mammals under the ESA[b]; NLAA marbled murrelet under the ESA[b] No take under the MBTA[b]			Project activities to occur along a busy industrial waterway that is routinely subject to in-water construction and vessel noise/vibrations. Species may be habituated to such disturbances and/or may move away from the pile-driving activity to avoid impacts. Underwater noise levels have the potential to surpass physical injury thresholds for two MMPA-protected marine mammals (i.e. Level A harassament for Dall's porpoise and harbor porpoise). Noise levels are not anticipated to exceed injury levels for marine mammals, fish, or birds protected under the federal ESA. Murrelets are uncommon within Elliott Bay and the East Waterway as suitable nesting habitat is located >27 miles away. The Coast Guard will work with USFWS on measures to minimize the risk of take of migratory sea birds protected under the federal MBTA that may forage under water. In coordination with NMFS and USFWS, extensive mitigation measures would be employed for federally protected species to minimize impacts to the extent possible.
Long-Term Operations							
Expanded Base Lighting	General Terrestrial Species (Mammals and Invertebrates only)	6	Animals may be attracted to or avoid excessive lighting.	Minor	Long-Term	Direct	Project activities to occur in an urban environment subject to many sources of high intensity lighting. Terrestrial animals may be adjusted to living with such distractions and/or may move away from distracting lights. Some flying insects may be attracted to the lighting. ECMs would be used to reduce upward light pollution and spill over to the adjacent waterway.
	Federally Protected Species (MBTA- and BGEPA-listed Birds only)			No take under the MBTA or BGEPA;			Project activities to occur in an urban environment subject to many sources of high intensity lighting. Federally protected bird species under the MBTA and the BGEPA may be adjusted to living with such distractions and/or may move away from bright lighting if distracting. The Coast Guard will follow USFWS guidance on lights at facilities to minimize impacts. The federal ESA-listed marbled murrelet would not be affected as it would not occur on land within the Action Areas and ECMs would be used to reduce light spill over to the adjacent waterway.
Additional Vehicle Movements	General Terrestrial Species (Non MBTA listed Birds, Mammals, and Invertebrates only)	7	Animals may avoid vehicles or move to nearby areas with similar habitat and less vehicular traffic.	Minor	Long-Term	Direct	The project is located within industrialized parcels currently subject to many vehicular movements. Terrestrial animals may be adjusted to living with such distractions and/or may move away from the equipment to avoid being struck. Vehicles would be restricted to existing roads/paths and parking areas.
	Federally Protected Species (MBTA- and BGEPA -listed Birds only)			No take under the MBTA or BGEPA;			The project is located within industrialized parcels currently subject to many vehicular movements. The federal ESA-listed marbled murrelet would not be affected as it would not occur on land within the Action Areas. Birds protected under the federal MBTA/BGEPA have the ability to move away from vehicles to avoid being struck. Vehicles would be restricted to existing roads/paths, parking areas, and authorized construction areas. The federal ESA-listed marbled murrelet would not be affected as it would not occur on land within the Action Areas.

Notes:
Impact Analysis definitions: NLAA = May affect, not likely to adversely affect, LAA = May affect, likely to adversely affect applies to species and critical habitats listed under ESA and for habitats identified as EFH under MSA. (Note: this determination requires consultation with NMFS and/or USFWS),

[a] = Impact Causing Element(s) are defined as follows: 1 = Excavation and grading, 2 = Seismic stabilization of the property, 3 = Use of power tools and heavy equipment for demolition, construction, and renovation of buildings, 4 = Excavated soil/construction debris stockpiling, 5 = Rehabilitation of the Terminal 46 wharf, 6 = Increased Base utilities and infrastructure, 7 = Increased number of Base personnel.

[b] = Impact analysis includes preliminary determinations based on reasonable assumptions for species protected under the federal ESA, MMPA, or the MBTA with the potential to be located within Action Area 4. Final effects determinations would be made during future consultation with NMFS and USFWS to satisfy federal ESA, MMPA, and MBTA requirements.

[c] = Impact analysis includes preliminary determinations based on reasonable assumptions for critical habitat protected under the federal ESA and EFH protected under the federal MSA designated within Action Area 4. Final effects determinations would be made during future consultation with NMFS and USFWS to satisfy federal ESA and MSA requirements.

Table 3.6-5 Disturbance Threshold Distance from Loudest Airborne Noise Sources for the Marbled Murrelet

Construction Equipment	Measured Average Maximum Sound (Lmax) at 50 feet (dB)	Distance (feet) to 90 dB Marbled Murrelet Threshold
Impact Pile Driver	105	281
Vibratory Pile Driver	105	281

Notes:
Source = WSDOT 2020 as referenced in Section 3.1
Lmax = maximum sound level
dB = decibels re 20 µPa

Since the maximum noise level generated during upland construction may temporarily reach levels above the established behavioral impacts threshold, applicable ECMs would be employed (e.g., low-noise emission equipment, minimizing idle time for equipment) to help minimize airborne noise generated on-site, to the extent possible. Nesting bird surveys would also be conducted prior to project activities slated during typical breeding seasons to avoid impacts to birds protected under the federal MBTA and BGEPA. The use of power tools and heavy construction equipment/machinery loud enough to cause behavioral impacts would only occur intermittently throughout upland construction period (approximately 6 years). Activities would likely be implemented on an 8-hour daily work schedule for a maximum of 5 days per week. Work would only be conducted during daylight hours (see Appendix E).

Overall, the direct adverse impacts from airborne noise and ground vibrations on terrestrial species (i.e., birds, mammals, and invertebrates) are considered short-term (i.e., approximately six years) and minor. With the implementation of ECMs, the expected behavioral response in animals (i.e., movement away from the Action Areas), is not anticipated to significantly impact critical breeding or feeding behaviors necessary for the survival of any species. Suitable nesting habitat for the marbled murrelet is mapped approximately 27.5 miles to the west/northwest, and this species is considered an uncommon visitor to the Action Areas. Therefore, behavioral impacts from airborne noise are likely minor for the ESA-listed murrelet (i.e., may affect, but is not likely to adversely affect). No effect on the murrelet from ground vibrations is expected as they would not be found using the upland areas. Impacts from airborne noise and ground vibrations would not result in incidental take of any bird protected under the MBTA or BGEPA, including their parts, nests, or eggs.

Terrestrial Vegetation Removal. The removal of terrestrial vegetation is likely to result from several project activities, including excavation and grading and the seismic stabilization of the property. This stressor has the potential to impact the following biological resources within the boundaries of the upland Action Areas:

- Terrestrial plants,
- Terrestrial birds (including bird species protected under the federal MBTA and BGEPA. Note: the ESA-listed marbled murrelet is not expected to use the upland portion of any Action Area as they forage and rest in water and nest in old growth forests located over 27 miles away [i.e., no effect]),
- Terrestrial mammals,
- Terrestrial invertebrates, and
- Upland landscape habitat.

Base Seattle and the proposed acquired properties are industrial in nature. With few exceptions, each property is almost entirely covered by impervious surfaces, including buildings, parking lots, bulkheads,

roads, and piers. Upland vegetation is restricted to landscape trees and shrubs or grasses and weeds that commonly grow in urban landscapes.

The permanent loss of some existing landscape habitat, including individual plants, would occur. Upland vegetation can provide important habitat for terrestrial wildlife. Animals that may be impacted by the removal of vegetation are expected to move to adjacent areas with similar habitat. They may either remain in their new location or return to the area shortly after upland construction activities have been completed. Plans include the creation of new landscape habitat in areas surrounding buildings proposed to be constructed throughout the upland Action Areas, which may attract individuals back to the Project area.

Overall, the direct adverse impacts from terrestrial vegetation removal on terrestrial resources (i.e., plants, birds, mammals, invertebrates, and landscape habitat) are considered short-term (i.e., approximately six years) and minor. With the implementation nesting bird surveys, the expected behavioral response in animals (i.e., movement away from the Action Areas) is not anticipated to impact critical breeding or feeding behaviors necessary for the survival of birds protected under the MBTA and BGEPA. Based on this evidence, the removal of terrestrial vegetation would not result in incidental take of any bird protected under the MBTA or BGEPA, including their parts, nests, or eggs.

In the long term, construction plans may be beneficial to upland habitat with the creation of more robust landscaped areas around new building foundations and the planting of only native vegetation. Additionally, actions to prevent of the spread of invasive or non-native weeds may occur (see Appendix E). Therefore, long-term habitat quality at the Base may be equal to, or improved over, existing conditions as a result of project activities.

Land Equipment Movement. Movements from land construction equipment (e.g., trucks, bulldozers) throughout the upland Action Areas are anticipated to result from various project activities, including excavation and grading, seismic stabilization of the property, and the use of power tools and heavy equipment for the demolition, construction, and renovation of buildings. This stressor has the potential to impact biological resources that may intersect the pathway of the moving equipment, such as:

- Terrestrial birds (including bird species protected under the federal MBTA and BGEPA. Note: the ESA-listed marbled murrelet is not expected to use the upland portion of any Action Area as they forage and rest in water and nest in old growth forests located over 27 miles away (i.e., no effect]),
- Terrestrial mammals, and
- Terrestrial invertebrates.

Increasing the amount of mobile equipment during upland activities correlates directly with an increased risk of a terrestrial animal being struck during routine movements throughout its home range. Base Seattle and the proposed acquired properties are industrial in nature. Daily vehicle flow rates for the regional roadways near Base Seattle have been documented between 9,100 and 69,500 (see Section 3.4.3). The number of construction vehicle trips per day is expected to average approximately 40 trips per day throughout the 6 years of upland construction. A peak of 95 construction vehicle trips per day is expected in 2028. These construction vehicle movements equate to less than or equal to 1 percent of the movements associated with other vehicles on busy roadways surrounding Base Seattle.

Most terrestrial species that occur within the upland Action Areas are expected to respond by moving away from moving equipment during construction. Individuals that respond in this way are expected to

either remain in their new location or return to the selected alternative's Action Area shortly after the upland construction component is finished. Although some ground dwelling invertebrates that cannot avoid impact may be lost, they are likely to be common species that are expected to repopulate quickly. Therefore, the viability of their populations would not be impacted.

Applicable ECMs may be employed to further reduce impacts, such as keeping much of the construction equipment and vehicles on-site for the duration of project implementation and ensuring construction personnel vehicles to remain within the selected alternative's site boundaries during daily construction work hours (see Appendix E).

Overall, the direct adverse impacts from construction equipment movements on terrestrial resources (i.e., birds, mammals, and invertebrates) are considered short-term (i.e., approximately 6 years) and minor. With implementation of nesting bird surveys, the expected behavioral response in animals to move away from the Action Areas is not anticipated to impact critical breeding or feeding behaviors necessary for the survival of birds protected under the federal MBTA and BGEPA. Based on this evidence, construction vehicle movements would not result in incidental take of any bird protected under the MBTA or BGEPA, including their parts, nests, or eggs.

Exposure to Hazardous Chemicals/Runoff. All upland construction activities (i.e., excavation and grading, seismic stabilization of the property, the use of power tools and heavy equipment for the demolition, construction, and renovation of buildings, and the stockpiling of excavated soil/construction debris) have the potential to expose biological receptors to underlying soils, construction debris, and/or chemical spills that may be hazardous. The movement of exposed soils and spilled materials also has the potential to move offsite and enter the adjacent waterway during storm events (i.e., stormwater runoff). Therefore, these stressors may impact the following terrestrial and aquatic resources:

- Terrestrial plants,
- Terrestrial birds (including bird species protected under the federal MBTA, BGEPA, and ESA);
- Terrestrial and marine mammals (including marine mammal species protected under the federal ESA and MMPA),
- Terrestrial and aquatic invertebrates,
- Fish (including fish species protected under the federal ESA), and
- Terrestrial and aquatic habitat (including aquatic habitat protected under the federal ESA and MSA)

Underlying soil at the project site contains historic fill. This fill is typically associated with elevated concentrations of petroleum products (e.g., PAHs) and metals (e.g., lead). Demolition debris may also contain hazardous material associated with old paint or building materials (e.g., asbestos). Exposure to such hazardous chemicals can occur while animals are foraging, burrowing, or grooming and can lead to chronic (long-term) or acute (short-term) toxicological effects. The effects are dependent upon the chemical concentration and duration of exposure.

Project activities are located within an urban environment subject to many hazardous waste sources (e.g., surface runoff from roads, vehicle engine leaks). The upland Action Areas are predominantly covered by impervious surfaces (e.g., concrete, pavement) and do not contain natural upland habitat communities. Therefore, terrestrial animals are not expected to forage in the ground or establish underground dens to any great extent. These are the two scenarios in which terrestrial wildlife receptors have an increased potential of being exposed to soils which may be contaminated.

Although stormwater runoff from stockpiled soils or chemical spills has the potential to discharge into the adjacent waters of Elliott Bay and the East Waterway, the Project area is topographically flat. Therefore, runoff is expected to be minor. Variables created by such things as soil composition (e.g., heavy sand particles settle quicker to the bottom than fine clay or silt particles), wind and currents, and the type of contaminant discharged, if any, may affect the size and extent of the disturbance. If chemicals are discharged through stormwater runoff or spills, those that dissolve in the water are expected to become diluted and those that chemically bind to soil and suspended sediment particles are expected to quickly settle to the bottom within hours (NMFS 2022). In-water disturbances are not expected to extend beyond the 281 feet established for each upland Action Area.

The river bottom within each upland Action Area extent is expected to exhibit a low volume of sediment dwelling invertebrates and no SAV. Runoff to the adjacent waterway would also be minimized through implementation of a SWPPP. This plan would include the use of engineering controls (e.g., silt fences, containment bins) to effectively block or stop runoff/spills from entering the waterway (see Appendix E). As a result, no surface water quality degradation or measurable sediment deposition through stormwater runoff is anticipated (see Section 3.3.4). In addition, no changes in water quantity, salinity, temperature, or sediment composition would occur that would impact aquatic habitat.

Most species that occur within the upland Action Areas are expected to avoid areas of possible contamination. Individuals that respond in this way are expected to either remain in their new location or return to the selected alternative's Action Area shortly after the upland construction component is finished. Various ECMs would be employed to further reduce the likelihood of exposure to upland biological resources. Some of these measures include removing hazardous soils/construction debris/chemical spills (e.g., grout) as soon as possible and in accordance with all applicable federal, state, and local laws. Exposed soil may also be temporarily covered with plywood, sheet metal, or similar material to reduce the likelihood of exposure. An SPCC Plan would also be prepared to ensure that land-based spills do not migrate to landscape areas with vegetation (see Appendix E).

Overall, the direct adverse impacts from exposure to hazardous chemicals/runoff on terrestrial resources (i.e., plants, birds, mammals, invertebrates, and landscape habitat) and aquatic resources (fish, mammals, invertebrates, and aquatic habitat) are considered short-term (i.e., approximately six years) and minor. With implementation of a SWPPP and other ECMs, the expected behavioral response in animals (i.e., movement away from the Action Areas) is not anticipated to impact critical breeding or feeding behaviors. Based on this evidence, exposure to hazardous chemicals/runoff is not likely to be meaningfully measured or detected (i.e., may affect, but is not likely to adversely affect) for fish, birds, and marine mammals protected under the federal ESA. It would also not qualify as take for any species protected under the MBTA, BGEPA, or MMPA. In addition, no destruction or adverse modification of aquatic habitat protected under the federal ESA or MSA is anticipated.

In-Water Construction. Rehabilitation of the Terminal 46 wharf is the only proposed in-water construction work that is certain to be performed wholly by the Coast Guard under all three action alternatives of the expansion and modernization program. This means that none of the work elements are anticipated to be performed under the separate CERCLA removal action. Rehabilitation of the Terminal 46 wharf is not, however, scheduled to begin until the second quarter of 2030. Therefore, specific design plans have not yet been developed. As a result, certain assumptions have been made regarding the in-water activities required for this work (e.g., vibratory removal of timber pilings, cutting of concrete pilings) (see Section 3.6.2).

The assumptions made regarding in-water work activities were used as the basis for predicting what stressors may result and how they may impact the various biological resources present within Action Area 4. As a result, the impact determinations are considered preliminary and may need to be re-assessed once detailed plans for the rehabilitation of the Terminal 46 wharf become available. Specifically, if site conditions or program plans change, the predicted impacts may not be appropriately accounted for. If not, additional NEPA analyses may be required.

The stressors predicted to result from in-water activities associated with the rehabilitation of the Terminal 46 wharf include:

- Underwater noise/sediment vibration,
- Pile driving/removal resulting in sediment suspension (turbidity) and loss of aquatic habitat, and
- Equipment movement.

Other potential in-water work involves the construction of new pier structures under Alternative 2 (i.e., Piers 35E/F) and Alternative 3 (i.e., Pier 35E only). Portions of the pier construction, however, may be completed under the separate CERCLA removal action (e.g., removal of existing pilings). Therefore, there is no way of currently identifying and analyzing the impacts associated specifically with the Coast Guard expansion and modernization program. With regard to the stressors identified above for the Terminal 46 wharf rehabilitation, however, it is assumed that pier construction work would likely result in impacts of the same extent and intensity. The most significant stressor anticipated in association with the pier work (i.e., loss of federally protected aquatic habitat) is qualitatively discussed in Sections 3.6.5.2, 3.6.5.3, and 3.6.6. Chapter 4, *Cumulative Effects*, provides an overview of the predicted effects of constructing new piers in combination with other regional projects, such as the CERCLA removal action.

Underwater Noise/Sediment Vibration. Similar to airborne noise, underwater noise is the most far-reaching program-related stressor associated with in-water construction activities. Underwater noise and sediment vibrations above background levels are likely to result primarily from the removal, cutting, and installation of wharf pilings during the Terminal 46 wharf rehabilitation process. These stressors have the potential to impact the following biological resources with the capability of being exposed (i.e., wildlife species that have a sense of hearing and touch) within the boundaries of Action Area 4:

- Terrestrial birds that dive under water to forage (including bird species protected under the federal MBTA and ESA. Note: Although the bald eagle forages along the top of the water, it does not dive under the water to obtain prey),
- Terrestrial mammals that dive under water to forage (river otters only),
- Fish (including those protected under the federal ESA),
- Marine mammals protected under the federal MMPA and ESA, and
- Aquatic invertebrates.

Unless otherwise noted, all underwater noise levels described in this section are referenced to 1 µPA.

The type and intensity of the noise/vibrations produced during pile extraction and driving depend on a variety of factors. Some factors include the type and size of the pile, the firmness and composition of the sediment bottom, the water depth, and the type and size of the pile-driving machine. For example, driving piles with impact hammers can produce intense, sharp spikes of sound that can reach peak levels that may cause physical harm (e.g., permanent hearing loss). Vibratory hammers, however, produce sounds of lower intensity with a more rapid repetition rate. These machines may evoke different

responses in aquatic species due to the difference in the duration and frequency of the sounds/vibrations (North Pacific Fisheries Management Council 2009).

Action Area 4 includes typical ambient noise and vibrations from a busy harbor environment. Sources of underwater noise from boats and other marine vessels can include the engine, propeller, acoustic devices (e.g., horns, sonars), and the interaction of waves with the vessel's hull. The various vessels that move through the East Waterway and Elliott Bay include ferries, cruise ships, container ships, and other boat traffic (NMFS and USFWS 2013). As a result, in-water noise has been reported near the Colman Dock ferry terminal in Elliott Bay at an average level of 123 dB_{RMS} (Laughlin 2011, as referenced in NMFS and USFWS 2013). Peak noise levels near Pier 70 have been reported at 147 dB (Laughlin 2006, as referenced in NMFS and USFWS 2013). Based on these findings, underwater background noise conditions within the Action Area are assumed to average 123 dB throughout the year (NMFS and USFWS 2013).

The average sound pressure level (SPL) generated as a result of in-water construction activities may reach as high as 161 dB_{RMS} for continuous noise source equipment (i.e., pile clipper) and 170 dB_{RMS} for impulsive noise source equipment (i.e., unattenuated impact pile driver) (see Table 3.6-6). These levels are based on reasonable assumptions made regarding the type of pilings to be removed and installed, as well as the anticipated methods of installation and extraction. Table 3.3-6 also provides the maximum distance required for noise to fall below the minimum disturbance threshold (i.e., 120 dB_{RMS}) for all species expected in the area provided in Table 3.6-7. The maximum distance (i.e., 5,580 meters) was used to develop the presumed in-water Action Area (i.e., Action Area 4). The minimum disturbance threshold of 120 dB_{RMS} established for marine mammals and river otters is, however, below the established ambient noise level reported for Elliott Bay of 123 dB_{RMS}. Therefore, the extent of Action Area 4 may be reduced in size upon future consultation with the USFWS and NMFS to adjust for the ambient environment.

Table 3.6-6 Maximum Disturbance Threshold Distances Predicted for Biological Receptors Exposed to Impact and Continuous Underwater Noise Sources

Pile Type	Action	Source Level (dB_{RMS})	Source Distance (m)	Distance to 120* dB_{RMS} (m)	Distance to 150** dB_{RMS} (m)
Continuous Noise Source					
24-inch Concrete Piles	Pile Clipper	161.2	10	5,580	56
Impact Noise Source					
24-inch Concrete Piles	Unattenuated Impact Pile Installation	170	10	Not applicable	215

Notes:
m = meters
dB_{RMS} = root mean square decibels re 1 µPa
* = based on behavioral disturbance level for marine mammals (Table 3.6-7)
** = based on behavioral disturbance level for fish and birds (Table 3.6-7)
Sources: San Diego Bay Acoustic Compendium, Naval Base Point Loma Fuel Pier Removal, California Department of Transportation (Caltrans) 2015 Table I.5.2

The use of in-water construction equipment capable of creating noise and vibrations above background conditions would occur intermittently throughout the rehabilitation of the Terminal 46 wharf areas

(approximately one year). Activities would likely be implemented on an 8-hour daily work schedule for a maximum of 5 days per week. Work would only be conducted during daylight hours (see Appendix E).

As stated previously, noise can impact a species by inducing physical injury and/or causing behavioral disturbances. Table 3.6-7 shows the minimum underwater noise thresholds established for the protection of the biological receptor groups anticipated to be exposed to underwater noise within Action Area 4. These levels have been set for both the onset of injury and the onset of behavioral impacts.

The injury threshold levels identified for fish, marine mammals, sea birds, and the river otter are based on the sound exposure level (SEL) of a noise source. This value takes into account both the peak intensity and duration of each noise event over time. Because those specifics for the Terminal 46 wharf rehabilitation are not currently available (e.g., how many strikes would be required to drive each pile or how many second/minutes would be required for pile-driving/extraction), it is uncertain whether in-water activities at Terminal 46 would rise to the level of injury.

Table 3.6-7 Minimum Injury and Behavioral Disturbance Thresholds for Biological Receptors Exposed to Underwater Noise

Minimum Noise Thresholds	Fish	Marine Mammals	Birds	River Otter
Injury (dB_{SEL})	183* (impulsive)	155**(impulsive) 173**(non-impulsive)	202*** (impulsive)	203**** (impulsive)
Behavioral Disturbance (dB_{RMS})	150	120 (non impulsive) 160 (impulsive)	150*** (impulsive)	120**** (non impulsive) 160**** (impulsive)

Notes:
Sources = NMFS 2018, Normandeau Associates, Inc. 2012, WSDOT 2014
* Based on fish ≤ 2 grams
** Based on high-frequency marine mammals (i.e., harbor porpoise and Dall's porpoise)
***Based on the marbled murrelet
**** Based on fur seals/sea lions (used as a surrogate for otters based on similar hearing function).
dB_{RMS} = root mean square sound pressure level (SPL) in decibels (reference value is 1µPa)
dB_{SEL} = sound exposure level (SEL) in decibels (reference value is 1µPa^2-second)

Because the average impulsive noise during in-water construction is expected to reach an SPL decibel level of 170 dB_{RMS}, it is reasonable to assume that the injury threshold for high frequency marine mammals (i.e., harbor porpoise and Dall's porpoise) would be exceeded (i.e., 155 dB_{SEL} re 1 µPa^2-second). Even with the implementation of a noise reduction device (e.g., bubble curtain), the noise created during impact driving (expected to be reduced to an average of 157 dB_{RMS}) may still rise above injury levels for high frequency marine mammals protected under the federal MMPA. Injury levels for other marine mammals range from 183 dB_{SEL} re 1 µPa2-second for low-frequency species (e.g., humpback whale) to 203 dB_{SEL} re 1 µPa2-second for eared seals (e.g., California sea lions) and are not expected to be surpassed.

Noise levels exceeding injury thresholds for marine mammals are related to the onset of when changes occur in the sound level at which an animal can perceive and respond. This permanent loss of hearing is referred to as a permanent threshold shift (PTS) and qualifies as Level A harassment under the federal MMPA. The onset of PTS can occur suddenly or develop gradually over time. PTS results primarily from the loss of inner ear hair cells and/or damage to auditory tissues (Saunders et al. 1985, Henderson et al. 2008).

With the potential for underwater noise to rise above injury levels for marine mammals, the Coast Guard is committed to working with NMFS to implement all necessary ECMs and mitigation measures to ensure that Level A harassment of high frequency marine mammals is minimized to the extent possible. Such measures may include, but are not limited to, soft starts, marine mammal observation and exclusion zones, bubble curtains, and/or work windows.

The average noise levels of 161.2 dB_{RMS} for continuous noise, and 170 dB_{RMS} for impulsive noise, generated during the in-water construction activity are certain to exceed behavioral disturbance thresholds for all fish and marine mammals (i.e., Level B harassment), as well as sea birds and river otters that forage under water. Behavioral responses to underwater noise for wildlife species may include such things as changing the duration of surfacing and dives or the direction/speed of movement, increases/decreases or the stoppage of certain activities (e.g., socializing, feeding), visible startle responses, or exhibition of aggressive behavior (e.g., jaw clapping) (NMFS 2019a).

Behavioral changes that have the potential to lead to significant impacts include (NMFS 2019a):

- Drastic changes in diving/surfacing patterns for marine mammals,
- Longer-term habitat abandonment due to loss of desirable acoustic environment, and
- Longer-term cessation of feeding or social interaction.

Aquatic invertebrates are more likely to respond to changes in sediment vibrations caused by sound waves as opposed to the noise intensity. Vibrations on the sediment floor are used by some benthic fauna to detect falling prey items or detect rival or predatory species (Roberts et al. 2016).

Based on the average background noise level reported for Elliott Bay (i.e., 123 dB_{RMS}) and the frequency of waterfront development within the area, most wildlife species are expected to be habituated to underwater noise and sediment vibrations associated with in-water construction activities. Because direct behavioral responses most often include avoidance behavior, those individuals that have not become accustomed to such disturbances are likely to respond by temporarily moving away from the area. Individuals that respond in this way are expected to either remain in their new location or return to Action Area 4 shortly after the in-water rehabilitation of the Terminal 46 wharf is complete. Other minor behavioral changes that are believed to suggest discomfort may also occur (Finneran et al. 2003; Ridgway et al. 1997; Morton and Symonds 2002; Nowacek et al. 2007; Thorson and Reyff 2006; Wartzok et al. 2003).

Increased underwater noise also has the ability to indirectly impact federally protected species by driving critical prey resources away from common foraging grounds. The predicted size of the area of impact resulting from underwater noise (i.e., Action Area 4) is however measured as 6.89 square miles. This area represents less than or equal to 1 percent of the critical habitat designated for ESA-listed species.

Based on the information that is currently available, the anticipated direct (e.g., behavioral disturbance) and indirect (i.e., movement of prey species away from foraging grounds) adverse impacts resulting from underwater noise/sediment vibrations on wildlife species (i.e., fish, marine mammals, aquatic invertebrates, and sea birds and river otters that forage under water) are considered short-term (i.e., approximately one year). Impacts on species that are not federally protected is considered minor because noise levels are not expected to rise above injury threshold levels. Significant behavioral changes are not expected that would impact the population viability of these common species.

As defined under the federal MMPA, Level A harassment of at least two marine mammals is considered likely to occur (i.e., harbor porpoise and Dall's porpoise). Level B harassment is predicted for all marine mammals within Action Area 4. The resulting unintentional Level A and B harassment is considered incidental take under the federal MMPA. Underwater noise is also likely to cause behavioral responses in fish and marine mammal protected under the federal ESA (i.e., likely to adversely affect). The ESA-listed marbled murrelet is uncommon and unlikely to forage heavily within Action Area 4. Therefore, behavioral impacts from underwater noise are likely to be minor for the ESA-listed murrelet (i.e., may affect, but is not likely to adversely affect). Impacts are not predicted to qualify as take for any migratory sea bird protected under the federal MBTA that may forage under water within Action Area 4.

Although adverse impacts are predicted for species protected under the federal ESA and MMPA (i.e., incidental take), these impact determinations are based on expectations of future activities. Once detailed Base Seattle modernization plans and detailed construction designs are developed, the list of federally protected species would be re-assessed and updated, if needed. At that time, anyspecies or impacts on species not considered in this analysis would be addressed. In addition, if impacts of the actions are still likely to adversely affect federally protected species, all required analysis documents (e.g., Biological Assessment [BA], Incidental Harassment Authorization [IHA] application) would be drafted based upon the best available information at that time. These documents would then be submitted to NMFS and USFWS for applicable consultations and authorizations.

Pile Driving/Removal. Physical disturbance of the Elliot Bay/East Waterway sediment floor is likely to cause the suspension of sediment particles in the water column during removal and installation of wharf pilings. The suspension of sediment has the potential to affect water quality by temporarily increasing turbidity (i.e., cloudiness) of the water body and resulting in:

- The deposition (i.e., deposit) of sediment outside the Project area footprint. The project footprint for in-water work is considered the area directly below the nearly 166,000 square feet of wharf sections in need of repair,
- Decreased ability of species to forage, and
- Increased exposure to hazardous chemicals trapped within the sediment.

The replacement of 14- to 16-inch timber pilings with 24-inch concrete pilings also has the potential to create a net loss of aquatic habitat.These consequences have the potential to impact the following biological resources with the potential of being exposed:

- Fish (including species protected under the federal ESA),
- Marine mammals protected under the federal MMPA and ESA,
- Aquatic invertebrates, and
- Aquatic habitat protected under the federal ESA and MSA.
- Diving birds protected under the MBTA

The size and extent of the disturbance caused by turbidity plumes generated as a result of in-water actions are difficult to quantify due to differences created by such things as sediment composition (e.g., heavy sand particles settle quicker to the bottom than fine clay or silt particles), wind and currents, and the type of pile-driving and extraction equipment to be used. Consequently, it is difficult to predict the specific areas that may be influenced by this stressor. Based on previous studies on suspended sediments, the turbidity plume is expected to be localized to a 300-foot radius surrounding each pile

(FHWA 2012). In addition, currents and tidal action are expected to promote the resettling of suspended sediment within a few hours based on the predominantly sandy sediment composition (NMFS 2022).

The sediment floor within the area of impact (i.e., 300 feet) surrounding the piles is expected to exhibit a low volume of sediment dwelling invertebrates and no SAV. Based on these conditions, river otters and sea birds, including those protected under the federal ESA and MBTA, are not expected to be foraging to any great extent in or near the sediment plumes (i.e., no impact).

Although the deposition of suspended sediment has the potential to smother some sediment dwelling invertebrates, those few that have the potential to be impacted are common species that are expected to recolonize once the wharf is rehabilitated. Sediment composition would not be altered and is expected to be uniform (i.e., silty sand or sandy silt) through the impact zone. The aquatic habitat in the area has been highly modified and water quality degradation in the area has been influenced by regional industries, as described in Section 3.3. As a result, the suspension of sediment during project activities would not be considered significantly different from background conditions.

Most species are expected to avoid the extent of the sediment plume by relocating to areas with similar habitat. Individuals that respond in this way are expected to either remain in their new location or return to the area shortly after in-water construction activities have been completed. The use of mitigation measures, such as turbidity curtains, may also be applied during the pile-driving/extraction process, if necessary, to reduce the distribution of suspended sediments and alleviate impacts on aquatic animals.

Removal of 345 14- to 16-inch creosote treated timber pilings and replacing them with approximately 310 24-inch concrete pilings would result in the net loss of approximately 500 square feet of nearshore habitat. This nearshore habitat is designated as EFH under the MSA and as critical habitat for the bull trout, Chinook salmon, and SRKW. Removing creosote from the habitat may have a long-term positive impact on the habitat features (e.g., SRKW CH features include water quality to support growth and development). Given that the final details of in-water work is unknown at this time, other in-water projects in the area were reviewed to inform possible future effects. A NMFS 2020 Biological Opinion on 39 separate permits for new, replacement, or repaired structures in the nearshore environment of Puget Sound concluded that altogether the action was likely to jeopardize ESA-listed salmon and SRKWsw and included an RPA to avoid jeopardy through conservation credits. Conservation credits can be earned through various means, such as implementing on-site or off-site habitat improvements, provide funding to a habitat restoration, purchasing conservation credits, or project modifications (NMFS, 2020). It is unknown at this time if conservation credits would be necessary for this project; however, as previously noted, the Coast Guard will initiate necessary consultations with USFWS and NMFS. The extraction of 345 creosote-treated timber pilings associated with Areas 1 and 3 of Terminal 46 is considered one such habitat improvement that would help offset the loss of critical habitat. The long-term benefit to the aquatic community comes from removing harmful chemicals from the estuary, such as PAHs, phenol, and creosols associated with the creosote coating. Removing such chemicals would restore water quality, and subsequently habitat function, within the Terminal 46 wharf rehabilitation footprint.

Based on the information that is currently available, the direct adverse impacts resulting from pile driving/removal on aquatic resources (i.e., fish, aquatic invertebrates, marine mammals, birds, and aquatic habitat) would be localized (i.e., confined within 300 feet) but long-term from the loss of aquatic habitat. With implementation of mitigation measures, the expected behavioral response (i.e., movement away from sediment plume) in fish and aquatic invertebrates that are not federally protected

is considered minor as it is not anticipated to significantly impact critical breeding or feeding behaviors that would impact the viability of their populations. The loss of such a small amount of aquatic habitat within the Puget Sound watershed would be negligible for these common species.

The direct impacts resulting from pile driving/removal is likely to adversely affect fish and marine mammals in the immediate area that are protected under the federal ESA. The impact may be greater for those species with critical habitat within the Terminal 46 wharf rehabilitation footprint (i.e., bull trout, Chinook salmon, and SRKW) because the pile driving/removal may affect habitat. This stressor also has the potential to harass (but not injure) marine mammals protected under the MMPA by potentially disrupting normal feeding patterns. Therefore, be adverse effects on nearshore aquatic habitat and EFH listed may occur under the federal ESA and MSA, respectively. *Underwater Equipment Movement*. The movement of underwater construction equipment (e.g., pile clipper) is anticipated to result from removal, cutting, and installation of wharf pilings. This stressor has the potential to impact the following aquatic species:

- Fish (including species protected under the federal ESA),
- Marine mammals protected under the federal MMPA and ESA, and
- Aquatic invertebrates.

The movement of large underwater equipment directly correlates with an increased chance of an animal being struck by the equipment during routine movements throughout their home range. It would only impact those aquatic species located within the Terminal 46 wharf rehabilitation footprint (i.e., below the nearly 166,000 square feet of wharf sections in need of repair), as they would be the only ones exposed to the moving equipment. Based on site conditions, river otters and sea birds, including those protected under the federal ESA and MBTA, are not expected to be foraging within the project footprint (i.e., no impact).

The installation of new pilings would result in penetration of the sediment floor where some aquatic invertebrates may occur. The removal of pilings may also result in the loss of some aquatic invertebrates that have colonized on the piling surface. Although some individual invertebrates may be lost, low numbers of sediment dwelling invertebrates are expected within the Terminal 46 wharf rehabilitation footprint. Those invertebrates lost are likely to be common species that are expected to repopulate/recolonize quickly. Therefore, the viability of their populations would not be impacted. Federally protected fish and marine mammals that may feed on these invertebrates would likely find robust populations elsewhere within Action Area 4. Therefore, they would not be impacted by the negligible loss throughout their range.

Project activities are also proposed along a busy industrial waterway subject to many vessel movements and construction activities. Most species are expected to be acclimated to such conditions simply avoid underwater equipment. Individuals that respond in this way are expected to either remain in their new location or return to the area shortly after in-water construction activities have been completed. The implementation of mitigation measures, such as soft starts, may help many aquatic animals avoid strikes by allowing them the opportunity to leave the area before the majority of underwater movements begin.

Based on the information that is currently available, the direct adverse impacts resulting from the movement of underwater equipment on aquatic resources (i.e., fish, aquatic invertebrates, and marine mammals) would be localized (i.e., confined within the project footprint), minor, and short-term or approximately one year. The expected behavioral response in animals (i.e., movement away from

equipment) is not anticipated to significantly impact critical breeding or feeding behaviors. As a result, exposure to underwater equipment movements may affect, but is not likely to adversely affect, fish and marine mammals protected under the federal ESA. It would also not qualify as take for any species protected under the MMPA. Without detailed project plans, these impact determinations are considered preliminary. They would be re-assessed and updated in the future, if needed.

Long-term Operations

No changes to overall, general day-to-day operations at the Base would occur following completion of construction activities. Existing operational and public safety and security conditions at the Base and surrounding Port properties are also not expected to change. Operations would continue to follow all federal, state, and local environmental protection laws and all existing Coast Guard environmental policies.

The expanded Base operations component would include an increase in Base personnel, the presence of new buildings, and minor site improvements made during construction (e.g., security fencing, lighting upgrades, pavement replacement, gate replacement, landscaping replacement). Some ECMs applied to new buildings, and upgrades to existing infrastructure, may result in long-term beneficial impacts for terrestrial species. These may include the use of new ecologically friendly features, such as avian protection measures and installation of bird-friendly glass in buildings (see Appendix E). Installation of such features would reduce the risk of accidental deaths, primarily to birds.

Other features, however, have the potential to adversely impact terrestrial species occurring within the upland Action Areas based on the following biological stressors:

- Additional vehicle movements
- Expanded Base lighting

Both of these stressors, and the specific impacts each one imparts on terrestrial biological resources, are evaluated below.

Additional Vehicle Movements. The movement of vehicles from added Base personnel has the potential to impact biological resources that may intersect the pathway of the vehicles, such as:

- Terrestrial birds (including bird species protected under the federal MBTA and BGEPA) Note: the ESA-listed marbled murrelet is not expected to use the upland portion of any Action Area as they forage and rest in water and nest in old growth forests located over 27 miles away [i.e., no effect]),
- Terrestrial mammals, and
- Terrestrial invertebrates.

When the proposed Base expansion and modernization program is complete, the Base personnel count is expected to rise approximately 67 percent, from an existing total of 1,140 employees to approximately 1,900, plus contractors. Increases in Base personnel would add additional traffic within the selected alternative's Action Area. This translates to an added 1,835 vehicle trips per day to and from Base Seattle under existing conditions to approximately 4,030 vehicle trips per day (see Section 3.4). In an urban environment where traffic volume along regional roadways reaches approximately 69,500 vehicle trips per day, the increase of 2,195 vehicle trips would equate to an increase of 3.2 percent.

Increasing the number of personnel vehicles moving throughout the Base directly correlates with an increased chance of a terrestrial species being struck during an animal's routine movements throughout its home range. The presence of additional vehicles within the selected alternative's Action Area may also restrict the use of upland habitat by terrestrial species. Impacts would be limited to those species that may be adapted to living in areas affected by frequent human disturbance. Therefore, some individuals may stay on the Base and learn to adapt to the increased traffic flow. Other individuals, however, may permanently relocate to areas with similar habitat and lower traffic volume to avoid this risk.

Applicable ECMs may be employed to further reduce impacts, such as restricting vehicles to existing authorized construction areas (see Appendix E).

Overall, the direct adverse impacts from the additional vehicle movements during Base operations on terrestrial resources (i.e., birds, mammals, and invertebrates) are considered long-term but minor in intensity. This stressor is not anticipated to result in incidental take of any bird protected under the federal MBTA or BGEPA, including their parts, nests, or eggs.

Expanded Base Lighting. The addition of new Base lighting on acquired properties has the potential to impact terrestrial biological resources that may occur within the upland Action Areas, such as:

- Terrestrial birds (including bird species protected under the federal MBTA and BGEPA). Note: the ESA-listed marbled murrelet is not expected to use the upland portion of any Action Area and proposed lighting ECMs would act to reduce/avoid spillover into the adjacent waterway (i.e., no effect]),
- Terrestrial mammals, and
- Terrestrial invertebrates.

Artificial light can have several adverse impacts on wildlife. It can act as an attractor for some species (e.g., flying insects), resulting in them being pulled away from their normal environment and concentrating them as a food source to be preyed upon. For other species, light can act as a repellant, excluding them from their natural habitat. Artificial light can disrupt an animal's normal flight activity or impact long-distance migration patterns. It can also alter an animal's normal daily or nightly routine, resulting in less sleep, or even affect reproductive cycles (Florida Fish and Wildlife Conservation Commission [FFWCC] 2022). For some species, such as migratory birds, exposure to artificial light can result in a change to their vision, causing them to lose sight of the horizon and circle endlessly. As a result, they can die from exhaustion or collision with the light source (FFWCC 2022). In certain cases, however, artificial lighting can be a benefit. For example, some species of birds or bats, such as the common nighthawk, may increase their foraging potential by targeting flying insects that are attracted to lights (American Bird Conservancy 2022).

Lighting currently associated with properties located adjacent to the Base are characteristic of an urban industrial environment. This means that those facilities are largely illuminated during nighttime hours. Although expansion of the overall footprint of Base lighting is proposed, the new lighting system would comply with the Coast Guard's *Configuration Standard Technical Order* (*CSTO) New Building Design and Construction* (Shore Infrastructure Logistics Center [SILC]-CSTO-36-71 91 11 12-10).

Species that are expected within the upland Action Areas are those frequently exposed to excessive night lighting throughout the greater Seattle area from other ports, streetlights, head lights, landscape

lighting, etc. Therefore, animals are expected to either be habituated to the regional lighting or move away to nearby areas with similar habitat but less artificial light.

Sustainability features recently established to reduce light pollution are also proposed to be implemented. These features may include the use of LED bulbs and incorporation of hoods used for down-cast lighting. Hoods also act to minimize unnecessary uplighting. With the implementation of these ECMs, the expanded Base lighting is likely to be similar enough to existing conditions to be immeasurable. Lighting ECMs are also designed to reduce/avoid spillover into the adjacent waterway (see Appendix E). As a result, no impacts to aquatic resources or sea birds/river otters that may forage or rest within the waterway are anticipated.

Overall, the direct adverse impacts from expanded Base lighting on terrestrial resources (i.e., birds, mammals, and invertebrates) are considered long-term but minor in intensity. This stressor is not anticipated to result in incidental take of any bird protected under the MBTA or BGEPA, including their parts, nests, or eggs.

3.6.5.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Alternative 1 includes acquisition of the largest amount of property of all three alternatives. This includes a large portion of Terminal 46, as well as the Belknap property. Removal of landscape trees, shrubs, grasses, or weeds during upland construction is limited to the landscaped areas surrounding existing Building 6 and along the southern and eastern parking areas associated with Building 4. Some of the landscaping along the northern side of Jack Perry Memorial Access Drive may also be damaged or lost during construction of the Mission Support Building (Figures 2-2 and 3.6-5). Alternative 1 includes rehabilitation of the Terminal 46 wharf. No new pier structures however are required to be constructed under this alternative.

Based on reasonable assumptions regarding plans under Alternative 1, both direct (short-term and long-term) and indirect (short-term) adverse impacts on various biological resources are anticipated. All impacts on terrestrial and aquatic resources that are not federally protected are anticipated to be minor in scale based on the commonality of the resource, the small size of the Action Areas, and the disturbed nature of the surrounding environment (i.e., urban industrial setting).

Pursuant to the federal ESA, there are no activities likely to adversely affect the marbled murrelet under Alternative 1 because it would be exposed so infrequently that impacts are considered discountable. All fish and marine mammals protected under this law, however, are likely to be adversely affected by underwater noise and the impacts caused by pile driving/removal. Underwater noise is also likely to result in the Level A harassment of high frequency cetaceans (i.e., harbor porpoise and Dall's porpoise) protected under the federal MMPA within Action Area 4. Noise and pile driving/removal are also likely to result in Level B harassment of all marine mammals within Action Area 4. There would be no take for birds protected under the federal MBTA or BGEPA. The adverse modification of nearshore habitat federally protected for the bull trout, Chinook salmon, and SRKW under the ESA is also anticipated under Alternative 1. These changes also correlate with modifications of EFH protected under the MSA. The Coast Guard is committed working with USFWS and NMFS during Section 7 ESA consultations so that adverse impacts on federally protected species are minimized or avoided. The Coast Guard would also apply for authorization under the MMPA and work with NMFS on required mitigation measures.

Considering the context of the surrounding urban industrial environment, the small project footprint, and the Coast Guard's commitment to working with the USFWS and NMFS with regard to minimizing the

effects on federally protected resources to the extent possible, pursuant to NEPA no significant impacts on biological resources would be expected from Alternative 1.

3.6.5.2 Alternative 2 – Modernization with Additional Land from Terminal 30 and Terminal 46

Alternative 2 includes the acquisition of a small piece of property from Terminal 46 and land from Belknap, BNSF Railway, MITAGS, Terminal 30, and Jack Perry Memorial Park. Removal of upland vegetation under this scenario would include landscape areas surrounding existing Building 6 and along the eastern parking areas associated with Building 4. Most, if not all, of the landscaping associated with Jack Perry Memorial Park may be lost to create more parking spaces (Figures 2-3 and 3.6-5). Similar to the Alternative 1, rehabilitation of the Terminal 46 wharf would be required under Alternative 2.

Terminal 30 contains an engineered sand cap over sections of known contamination (see Section 3.11). The Coast Guard would take care to prevent disturbance of this cap to avoid unnecessarily exposing ecological resources to the underlying contamination. If trenching and/or disturbance of this cap is required during construction, a contaminated media management plan would be prepared, and the sand cap would be replaced following construction. Under this scenario however, terrestrial species may be subject to increased exposure to hazardous chemicals. Despite this, the majority of terrestrial wildlife expected within the upland portion of Action Area 2 are likely to be common urban species that are not federally protected.

Unlike Alternative 1, two new pier structures (i.e., Piers 35E/F) are proposed to be constructed under Alternative 2 (Figure 2.5-3). Based on an estimate of the size of the new pier, it is likely to result in additional long-term destruction or adverse modification of approximately 0.0017 square miles (1.1 acres) of nearshore critical habitat currently protected under the federal ESA for Chinook salmon and the SRKW (Figure 3.6-6) and EFH protected under the MSA.

Although portions of the new pier work may be performed under the separate CERCLA removal action, the greatest amount of federally protected nearshore aquatic habitat impacted as a result of the Base expansion and modernization program is expected under Alternative 2. The condition of the nearshore environment within the footprint of the proposed Piers 35E/F has previously been altered from its natural state. These disturbances include the addition of rip-rap along portions of the bank, the construction of the boat launch area south of Pier 36A, the Terminal 30 bulkhead, and existing Pier 35. As such, the amount of federally protected nearshore habitat that would be lost or modified under Alternative 2 is considered poor in quality. The amount is also considered small in comparison with the total amount of critical habitat established for the Chinook salmon and SRKW (e.g., less than or equal to 0.00001 percent for the SRKW) (see Table 3.6-2). Regardless of the condition, however, the greatest number of beneficial measures to offset this loss would be required for Alternative 2 in comparison with the other two action alternatives.

Under Alternative 2, there would be no measurable differences in the context or intensity of the direct (short-term and long-term) and indirect (short-term) adverse impacts on biological resources as those anticipated under Alternative 1 for upland activities. For in-water impacts, differences include an extended construction time frame, beyond the one year anticipated under Alternative 1. The Coast Guard would be committed to working with the USFWS and NMFS during Section 7 ESA consultations on mitigation measures should Alternative 2 be selected. These measures would ensure that adverse impacts on federally protected species are minimized or avoided and that the net loss of critical habitat is reduced to zero.

Considering the context of the surrounding urban industrial environment, the small project footprint, and the Coast Guard's commitment to working with the USFWS and NMFS with regard to minimizing the effects on federally protected resources to the extent possible, pursuant to NEPA no significant impacts on biological resources would be expected from Alternative 2.

3.6.5.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

Alternative 3 includes the acquisition of land from BNSF Railway and MITAGS, in addition to a piece of Terminal 46 and the Belknap property. Removal of upland vegetation under this scenario would be the same as in Alternative 1 (Figures 2-4 and 3.6-5). Under Alternative 3, the rehabilitation of the Terminal 46 wharf would also be required.

Similar to the Alternative 1, Alternative 3 also requires rehabilitation of Terminal 46 wharf. One new pier structure (i.e., Pier 35E) would also be constructed spanning the western boundary of the Base Seattle property (Figure 2.5-4). Based on an estimate of the size of the new pier, it is likely to result in additional long-term destruction or adverse modification to approximately 0.00057 square miles (0.4 acres) of nearshore critical habitat currently protected under the federal ESA for the Chinook salmon and the SRKW (Figure 3.6-6) and EFH protected under the federal MSA

Although portions of the new pier work may be performed under the separate CERCLA removal action, more federally protected nearshore aquatic habitat is expected to be impacted as a result of the Base expansion and modernization program under Alternative 3 than Alternative 1. As discussed under Alternative 2, the condition of the nearshore environment within the Pier 35E footprint has been previously affected by human disturbance. These disturbances include the addition of rip-rap along portions of the bank and the construction of the boat launch area south of Pier 36A. Therefore, the amount of federally protected nearshore habitat that would be lost or modified under Alternative 3 is considered poor in quality. The amount is also considered small in comparison with the total amount of critical habitat established for the Chinook salmon and SRKW (e.g., less than or equal to 0.000004 percent for the SRKW) (see Table 3.6-2). Regardless of the condition, however, additional beneficial measures to offset this loss would be required in comparison with Alternative 1.

Under Alternative 3, there would be no measurable differences in the context or intensity of the direct (short-term and long-term) and indirect (short-term) adverse impacts on biological resources as those anticipated under Alternative 1 for upland activities. For in-water impacts, differences include an extended construction time frame, beyond the one-year anticipated under Alternative 1. The Coast Guard would be committed to working with the USFWS and NMFS on mitigation measures during Section 7 ESA consultations should Alternative 3 be selected. These measures would ensure that adverse impacts on federally protected species are minimized or avoided and that the net loss of critical habitat is reduced to zero.

Considering the context of the surrounding urban industrial environment, the small project footprint, and the Coast Guard's commitment to working with the USFWS and NMFS with regard to minimizing the effects on federally protected resources to the extent possible, pursuant to NEPA no significant impacts on biological resources would be expected from Alternative 3.

3.6.6 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, land acquisition; construction; and expanded long-term operations of Base Seattle would not occur. Therefore, stressors related to proposed expansion and modernization program components (e.g., airborne and underwater noise, upland vegetation removal, exposure to

hazardous chemicals) would remain unchanged. As such, there would be no direct (short-term and long-term) or indirect (short-term) adverse impacts on biological resources under the No-Action Alternative.

There would also be no long-term benefits to biological resources under the No-Action Alternative. Activities associated with the expansion and modernization of Base Seattle that have the potential to improve habitat quality and minimize risk to species over existing conditions include:

- Removing creosote-treated timber pilings at Terminal 46 wharf Areas 1 and 3
- Including avian protection measures
- Installing bird-friendly glass in renovated buildings
- Creating more robust landscape areas with native, non-invasive, species

3.6.7 Comparison of Alternatives

There are slight variations between the three action alternatives with respect to upland property acquisitions, location of building demolitions/construction, and amount of upland ground disturbance required. The most significant difference with regard to upland impacts on terrestrial resources is related to Alternative 2. Under this scenario, the greatest areal extent of scattered upland vegetation would be removed, including native madrone trees and landscaped parkland associated with Jack Perry Memorial Park. This is considered a short-term adverse impact as new landscape areas are planned.

Construction of new pier structures would also occur under Alternatives 2 and 3, which are not proposed under Alternative 1. Alternative 2 includes plans to build Pier 35E which would span the southwestern portion of the current Base property and extend into Jack Perry Memorial Park and Terminal 30. Under this alternative, Pier 35F would also be expanded at Terminal 30 (Figure 2.5-3). Alternative 3 calls for constructing Pier 35E only, which is proposed to span within the confines of the current Base property boundary (Figure 2.5-4). The construction of the new piers would occur in waters currently designated as critical habitat for the Chinook salmon and SRKW and EFH for groundfish and salmon. The Coast Guard would work with the NMFS to minimize the impacts of new structures or expansion of existing structures, as appropriate, using the best available science at the time on mitigating impacts. The goal is to avoid any long-term, adverse impact that may cause the destruction or adverse modification of federally protected aquatic habitat under the federal ESA and MSA. Additional beneficial measures would be required Alternatives 2 and 3 to offset the additional losses.

With the Coast Guard's commitment to conduct consultation with the USFWS and NMFS and develop appropriate mitigation measures to minimize impacts, pursuant to NEPA no significant impacts on biological resources would be expected under any of the alternatives or the No-Action Alternative.

Table 3.6-8 Comparison of Alternatives for Biological Resources

Comparison of Alternatives for Biological Resources Impacts	
Alternative 1	No significant impacts.
Alternative 2	No significant impacts.
Alternative 3	No significant impacts.
No-Action Alternative	No significant impacts.

3.6.8 Environmental Conservation Measures

Potential future adverse impacts on biological resources have been identified under all three alternatives due to in-water work. The Coast Guard is committed to implementing the use of ECMs, environmental commitments, and special procedures. The Coast Guard is also committed to working

with NMFS and USWFS, using the best available science at the time, on mitigations and measures necessary to minimize impacts on species and critical habitats, as required under the ESA. All applicable measures may be incorporated in project design plans in order to avoid or minimize impacts on biological resources. Beneficial measures would be explored with guidance from the USFWS and NMFS to reduce the loss of critical habitat. Further details regarding the measures that are currently identified as reasonably certain to be used for the protection of biological resources are provided in Appendix E.

3.7 Socioeconomics and Environmental Justice

Summary of Findings

The Proposed Action and its action alternatives have the potential to cause long-term impacts. The impacts would be both beneficial and adverse impacts to the local economy and jobs, both direct and indirect. There would be a change of type of jobs. The jobs lost in the area would be associated with port container operations. These jobs would not be the same as the jobs associated with Coast Guard operations. Many of the positions could be occupied by workers that are residents of other states. Generally, revenue stream types will differ. Instead of revenue that would be generated by container operations, there would be an increase in revenue to local businesses supporting Coast Guard operations to the extent this work is supported by local businesses, local spending in restaurants, stores, and other establishments. Additionally, revenue that the Port would make through leasing would be lost. Therefore, long-term significant impactswould occur to socioeconomics. Renovation or demolition of Building 7 would represent a potentially significant adverse impact to an environmental justice community – residents of the St. Martin de Porres homeless shelter located in Building 7 – especially if USACE is unable to temporarily or permanently relocate the facility.

All action alternatives may have disproportionate impacts on minority and low-income populations, children, or underserved communities due to the effects to the St. Martin de Porres shelter. Therefore potentially significant impacts would occur to an environmental justice community.

The Coast Guard invites the public to provide ideas that could be implemented to mitigate impacts to the homeless population that utilizes the shelter at Base Seattle. The Coast Guard will consider the public's input and the Coast Guard's legal authorities to implement the solutions when making a decision.

3.7.1 Background

Socioeconomics

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Population is affected by natural growth rates as well as net regional migration in or out of the region. Economic activity typically comprises employment, personal income, and industrial growth. Impacts on these three fundamental socioeconomic indicators can also influence other components such as housing availability and public services.

Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, focuses the attention of federal agencies on human health and environmental conditions in minority populations and low-income communities. Additionally, EO 12898 requires federal agencies to ensure disproportionately high and adverse human health or environmental effects on minority and low-income communities are identified and addressed. Minority populations refer to any readily identifiable group of minority persons (e.g., Black, Hispanic or Latino, Asian American, Alaskan Native, Native Hawaiian, other Pacific Islander, or other non-white populations). Low-income populations are typically defined as at or below 80 percent of the median household income, adjusted for family size, in the county in question (State of Washington 2021).

EO 13985, *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*, was issued in 2021 with the intent of Federal agencies developing a comprehensive approach to advancing equity for historically underserved communities. Underserved communities include those populations that share a particular characteristic, and geographic communities that have historically and systematically been denied a full opportunity to participate in aspects of economic, social, and civic life. These communities include Black, Latino, Indigenous and Native Americans, Asian Americans, Pacific Islanders, other persons of color, members of religious minorities, lesbian, gay, bisexual, transgender and queer persons, persons with disabilities, persons who live in rural areas, and persons otherwise adversely affected by persistent poverty or inequality.

EO 14008, *Tackling the Climate Crisis at Home and Abroad* was established with the intent of making climate considerations an essential element of United States foreign policy and national security planning. The EO further established a National Climate Task Force responsible for developing a government-wide approach to address the climate crisis, including actions to reduce climate pollution, protect public health, and deliver environmental justice.

EO 14031, *Advancing Equity, Justice, and Opportunity for Asian Americans, Native Hawaiians, and Pacific Islanders*, reinforces the Government's commitment to EO 13985 with a focus on advancing equity and racial justice for underserved communities, including Asian Americans, Native Hawaiians, and Pacific Islanders.

Protection of Children

EO 13045, *Protection of Children from Environmental Health and Safety Risks*, was issued to prioritize the identification and assessment of environmental health and safety risks that may affect children. Additionally, EO 13045 requires federal agencies' policies, programs, activities, and standards to address environmental health risk and safety risks to children because children may suffer disproportionately from environmental health and safety risks.

3.7.2 Approach to Analysis

Socioeconomics

Population and economic activity impacts are assessed in terms of their direct and indirect effects on the local economy and other socioeconomic resources, such as substantial shifts in population, effects on the availability of housing, or adverse effects on regional spending, revenue generation, or earning patterns. The magnitude of potential impacts can vary depending on the location of an action. For example, implementation of an action that creates 200 employment positions may be unnoticed in an urban area but may have significant impacts in a more rural area.

The analysis looks at regional socioeconomic impacts of the Proposed Action as well as port-related potential impacts. The Project area for general socioeconomic activity (e.g., population, economic activity) is considered the Seattle Metropolitan Statistical Area (SMSA). Impacts to the project area and related to the land acquisition of Port of Seattle property focus on NWSA and associated Port economics. Base personnel currently, and it is assumed in the future, reside at locations throughout the SMSA (see Section 3.4).

The baseline economic activity for NWSA and Port of Seattle is based on data from NWSA from 2017 (the most recent published data) and from the Washington State Office of Financial Management and Community Attributes. Data from these sources are used to identify total jobs, payroll, business output/revenue, and total TEU volume. It is also used to calculate jobs, payroll, and revenue per TEU. Port capacity is determined by how many containers or other cargo the Port can handle over a given time period. Several physical factors contribute to the capacity of any port, but acreage is the most relevant factor for determining annual capacity or throughput of container terminals (BTS 2017).

Three important factors analyzed to determine impacts to port activities include job losses or gains, payroll, and port revenue. Estimates for jobs, payroll, and revenue per twenty-foot equivalent unit (TEU) is assumed to be evenly distributed across all Port terminals regardless of the type of terminal (e.g., container, break-bulk). The analysis compares acreage of NWSA managed property with the reported annual total of TEUs and calculate a TEU per acre metric. Using this metric, the baseline economic activity is established. The impact analysis uses a similar TEU per acre metric to calculate reduction in cargo handling and storage capacity, or total TEUs, by alternative. Finally, the analysis applies reduced TEU value combined with 2017 "per TEU value" for jobs, payroll, and revenue per TEU to estimate economic values for each category under the three alternatives.

Beyond assessing impacts of reduced economic activities from proposed land acquisition, short-term construction wages and long-term Coast Guard personnel wages are estimated based on the anticipated number of workers by year and average hourly wage rates. Additionally, expected contractor wages necessary to sustain and maintain vessels calling at Base Seattle over time are calculated based on estimated distribution of contractor positions and local average wages for those jobs. Beyond additional wages generated by increased Base Seattle personnel and contractors, it is expected that government spending would generate additional jobs in the local economy. These induced jobs were estimated by using the ratio of 0.84 job/$100,000 of annual defense spending (Auerbach, Gorodnichenko, and Murphy 2019). This estimated level of job creation is then compared to the potential reduction in NWSA positions associated with loss of economically viable port property.

Environmental Justice

The U.S. Census Bureau's *2014-2018 American Community Survey Five-Year Estimate* was used to identify environmental justice populations in the vicinity of Base Seattle, including minority populations and low-income populations. Given that impacts on environmental justice communities are localized, the Project area for the environmental justice analysis is U.S. Census Bureau Census Tract 93/Block Group 2, which contains Base Seattle, Terminals 46 and 30, and the surrounding industrial area. USEPA's Environmental Justice Screening and Mapping Tool, or EJScreen (which disaggregates U.S. Census data to more refined tract and block group levels) was used to collect data to determine if minority populations or low-income communities could be disproportionately affected (USEPA 2021). The boundary of Census Tract 93/Block Group 2 is shown in Figure 3.7-1 and the corresponding EJScreen report for Block Group 2 is provided in Appendix K. This same tool is used to analyze similar data, as available, for underserved communities. Environmental justice impacts are evaluated based on the

potential to disproportionately affect such a community with high and adverse health or environmental effects. The potential for disproportionate effects for environmental justice impacts rely on the consideration of both the population characteristics explained above and the potential of this population to experience adverse impacts from the resource areas analyzed in this PEIS (i.e., a resource area must demonstrate an impact).

Protection of Children

Data used for the Protection of Children analyses were collected from the *2014-2018 American Community Survey Five-Year Estimates* and the *2019 American Community Survey One-Year Estimates* for the Project area, the state, and the nation. Similarly, these data source were used to assess the potential effects on children to comply with EO 13045.

3.7.3 Affected Environment

Regional Setting

Base Seattle is located in the City of Seattle, which in turn is located within King County and within the SMSA. In 2020, the City of Seattle and had a population of approximately 737,015. King County encompasses approximately 2,132 square miles and in 2020 had a population of approximately 2.3 million people. In addition to King County, the SMSA includes Snohomish and Pierce Counties. The SMSA includes the cities of Tacoma with approximately 218,000 residents; Bellevue with approximately 150,000; Kent with about 132,000; Everett at about 111,000; and Renton with almost 102,000. In total, the SMSA has a population of about 4.01 million people (U.S. Census Bureau 2020).

Population and Housing. The area has experienced substantial historical population growth. Between 2010 and 2020, the population in the SMSA grew by more than 580,000 people. King County has increased from approximately 1.5 million residents in 1970 to nearly 2.3 million in 2020 (Washington REAP 2020). The population for the City of Seattle has grown at a rate faster than both the State of Washington and the nation (State of Washington 2019, Statistica 2020). The COVID-19 pandemic disrupted population growth across the U.S., including Seattle. It is anticipated that the slowing of growth during the pandemic will be temporary and that long-term growth projections that were developed prior to the COVID-19 pandemic most likely remain accurate.

Table 3.7-1 Population Trends

Geographic Area	2010 Population	2020 Population	Change in population 2010-2020	2035 Projected Population	Projected Change in Population 2019-2035
Seattle	608,660	737,015	+21.0%	873,675	+18.54 %
King County	1,938,431	2,269,675	+17.1%	2,530,000	+11.47 %
SMSA	3,433,000	4,018,762	+17.1%	Not available	Not available
Washington	6,724,540	7,705,281	+14.6%	9,065,723	+19.05 %
U.S.	309,300,000	331,449,281	+7.2%	370,340,000	+12.82 %

Sources: U.S. Census Bureau 2020, State of Washington 2019, City of Seattle 2016

Base Seattle is bordered by a highly industrialized area, including commercial and industrial uses associated with the Port of Seattle. The adjacent South of Downtown (SODO) neighborhood has recently begun to permit a limited number of residential lofts and apartments within the industrial zone but single-family residential development and schools are not located within a 1-mile radius of the Project

area. The City of Seattle's Comprehensive Plan does not project development of housing within the industrial area and in proximity to Base Seattle (City of Seattle 2020d).

Based on data from the American Community Survey conducted as part of the 2020 U.S. Census data collection, the rental vacancy rate in the SMSA was 4.42 percent as compared to a State of Washington rate of 4.31 percent and a U.S. rate of 5.97 percent. (USCB 2020). Median gross rent in the SMSA was approximately $1,620 per month (ACS 2019).

Census Tract 93/Block Group 2 is home to 1,441 people and 725 housing units. Due to the area's long-standing zoning for industrial use, limited residential developments and no schools are located within a 1-mile radius of the Project area, which protects the public from potentially hazardous land use activities located on the industrial waterfront.

Employment, Industry, and Income. The SMSA supports a robust economy and sustained growth. The largest employers in the SMSA include Boeing, Microsoft, University of Washington, Amazon, and King County (MetroMBA 2016). Coast Guard employment at Base Seattle has remained stable and has had approximately 1,140 Coast Guard personnel over the last decade. This includes both collocated units and cutter personnel. Decommissioning of aging cutters will cause Base Seattle personnel counts to temporarily drop in the near term to as low as 800.

As of 2018, 16,501 persons in the SMSA were unemployed from the total labor force resulting in an annual average unemployment rate of 3.5 percent. This unemployment rate is lower than the State of Washington rate (4.3 percent) and slightly higher than the national rate (3.4 percent) (ACS 2018). Between 2010 and 2019, the unemployment rate in the SMSA decreased slightly overall.

Data from the 2020 U.S. Census for per capita personal income in the SMSA, as compared to the national and State averages, is provided in Table 3.7-2. Per capita income in the City is more than 50 percent greater than the national average (U.S. Census Bureau 2020).

Table 3.7-2 Per Capita Income, 2020 Estimates

Geographic Area	Per Capita Income
King County	$55,374
SMSA	$80,420
State of Washington	$68,322
U.S.	$35,384

Source: USEPA 2021; U.S. Census Bureau 2020

Commercial Fishing. Commercial fishing vessels utilize Elliott Bay and the Duwamish waterway to offload their catch. The catch includes, but is not limited to salmon, crab, and albacore tuna. Commercial fishing is a major revenue source for the Port of Seattle and the City. In 2017, the Port of Seattle generated more than $671 million in business output from commercial fishing through more than 300 fishing vessels (Port of Seattle 2017). Given the restricted access to waterside areas adjacent to the Base and industrial and terminal operations at Terminals 46 and 30, commercial fishing activities are not initiated from or performed at any of these locations. Terminal 91 and Fishermen's Terminal—located approximately 5 and 7 miles northwest of Base Seattle, respectively—serve as the homeport for major commercial fishing fleets and factory trawlers from October to May.

In addition to the commercial fishing opportunities, the Muckleshoot and Suquamish Tribes hold adjudicated fishing rights in the Duwamish Waterway, East Waterway, West Waterway, and Elliott Bay. Additional information on U&A fishing areas is provided in Section 3.8, *Cultural Resources*.

Commercial Shipping. Elliott Bay is a naturally deep harbor with no requirement for regular dredging operations. This allows for access by large commercial vessels with few interruptions in shipping and cargo loading activities (Port of Seattle 2019a). The area's prioritization of commercial waterway use aligns with the City's Comprehensive Plan, which aims to reserve waterfront lots along Elliott Bay for major port terminals, large water-dependent and water-related manufacturing and industrial facilities, and major water-dependent recreational development. Commercial shipping does currently occur at Terminal 30. Although Terminal 46 is listed as an alternative maritime cargo terminal by NWSA, it is capable of supporting commercial container shipping and is analyzed in this capacity within this PEIS.

Recreational Fishing and Boating. The Duwamish Waterway and Elliot Bay provide for public recreational fishing and boating opportunities. Given the restricted access to the Base and industrial operations at Terminals 46 and 30, recreational fishing and boating activities are not initiated from these locations. Jack Perry Memorial Park does provide approximately 120 feet of public shoreline access that allows for limited kayaking and fishing opportunities. Information on recreational opportunities is provided in Section 3.13, *Recreational Resources*. The State of Washington identifies seasons and rules for sportfishing to provide the public with a set of guidelines to ensure marine ecosystem sustainability and public access to recreational fishing opportunities. Elliott Bay is located within State Marine Area 10 (State of Washington 2022).

Tourism. The City of Seattle serves as a major U.S. tourist destination for regional and international travelers. The project area (Base Seattle and immediately adjacent properties) is located in an industrial zone and tourism opportunities are extremely limited. Tourism adjacent to the industrial area include the sports stadiums and the Pioneer Square District. More tourism opportunities are available just beyond the Project area, such as the aquarium, shopping areas, and restaurants. Pier 91, located approximately 5.2 miles north of the Base, serves as a homeport for a range of cruise ship operations. This facility operates from May through September and is the closest ocean-based, tourism-focused development to the project area.

Minority Populations and Low-Income Populations. As discussed in the approach to analysis, Census Tract 93/Block Group 2 is the defined Project area for the environmental justice analysis. People of color represent 29 percent of the Block Group 2 residents, as compared to 31 percent statewide (see Appendix K). The Block Group 2 minority population of 29 percent is below the statistical threshold that would disproportionately affect minority populations (USEPA 2021). The Census Tract 93 minority population also falls below the environmental justice statistical threshold, defined by CEQ as where the minority population of the affected area exceeds 50 percent. Table 3.7-3 provides specific ethnicity characteristics for Block Group 2 as well as for Census Tract 93 and the State of Washington.

The entirety of Census Tract 93, including Block Group 2, is considered a low-income population. The low-income population percentage Census Tract 93 is 21 percent and Block Group 2 is 24 percent as compared to the State of Washington at 26 percent and the nation at 31 percent (see Appendix K). Approximately 14 percent of the population within Census Tract 93 is below the poverty level, compared to 11 percent for Block Group 2. By comparison, the population within the State living below the poverty line was 9.8 percent in 2019, and nationally, the population below the poverty line was 11.4 percent (U.S. Census Bureau 2020). Per capita income within Block Group 2 for 2020 was $76,095. Similar data for Seattle, King County, the State of Washington, and the U.S. is provided in Table 3.7-2.

Protection of Children. EO 13045 specifically requires federal agencies to determine if actions may present a health or safety risk to children. Schools and day care centers are examples of locations where children could be exposed to local environmental health risks because higher concentrations of children

Figure 3.7-1 Boundaries of Census Tract 93/Block Group 2

Table 3.7-3 Regional Ethnicity Characteristics

Identified Race/Origin	Census Tract 93 / Block Group 2 (percent)	Census Tract 93 Total (percent)	State of Washington (percent)
Black or African American	5.2	8.5	3.8
White	76.3	53.4	63.8
Asian	5.6	18.7	9.4
American Indian and Alaska Native	1.5	1.9	1.3
Native Hawaiian or other Pacific Islander	0	0.7	0.8
Hispanic or Latino	8.9	12.7	13.7

Notes: Columns do not sum to 100 percent due to rounding errors and individuals claiming two or more ethnicities.
Source: U.S. Census Bureau 2020

gather during the day. The assessment area for protection of children includes the Seattle Public Schools district, which is the largest public school district in the State. As described previously, no public schools or daycare facilities are located within 1 mile of the Base. The USEPA EJScreen report (see Appendix K) for Block Group 2 reports that 2 percent of the population within the block group is under the age of 5.

Base Seattle

On-base housing for unaccompanied personnel is provided in Building 6. This is a three-story building with a total of 54 beds; 35 assigned to permanent personnel, 12 reserved for transient personnel, and 7 reserved for Watch Standers. In addition, the Coast Guard leases 14 three-bedroom units in the Seattle area to accommodate single personnel (typically junior enlisted personnel) who have been assigned to cutters. The current occupancy rate is estimated at 95 to 100 percent at Building 6 and 90 to 100 percent for Coast Guard-leased, off-base units. The Coast Guard owns no housing in Seattle, and U.S. Department of Defense housing is not currently available in the city or county (Coast Guard 2019a).

A portion of Building 7 on the installation is currently licensed to USACE, which in turn leases the space to the City of Seattle. The City of Seattle then works with St. Martin de Porres, a local non-profit, to serve the vulnerable population of homeless men. The Coast Guard does not have the legal authority to expend funds for operation of the shelter and therefore use of the space has been licensed to USACE, who is the agency responsible for administering the use by St. Martin de Porres. The USACE's lease for the space expires in 2023. The USACE has the authority to issue the lease under 10 USC §2256, which allows the USACE to use excess Department of Defense facilities to provide housing for homeless populations. The St. Martin de Porres shelter is an emergency homeless shelter (All Home 2020). It provides a maximum of 212 beds tomen in need and aged 50 and over (Catholic Community Services 2020). During the COVID-19 pandemic, the number of available beds reported to HUD was reduced to 140 (HUD 2021). The shelter opened in 1985 and is one of 22 shelters currently operating in the Seattle area. Although several other shelters exist within a 1-mile radius of Base Seattle, most of those shelters are for single women, women with children, or families. In 2020, a survey was conducted to try to take a snapshot of the demographics of the homeless community in King County. It was estimated that there were 11,751 homeless individuals in King County (see Table 3.7-4), but this number is likely underestimatede. The number of people in King County that may have experienced homelessness at some point doing 2020 was most likely about 40,800 people (King County 2021). Approximately 56 percent of the homeless population identifies as male, and 24 percent of the homeless population are over the age of 51 (see Table 3.7-5) (All Home 2020). In 2022, there were a total of 15,105 beds, of which only 2,162 were adult-only emergency shelter beds, an increase from 1,852 available beds in 2021 (HUD 2021). Additionally, minority populations are disproportionately represented among the homeless

population. Given that the greatest number of homeless identify as male, but a fewer percentage of beds are allocated to the male population and homeless males are likely disproportionately made up of minority populations, the elderly homeless male population is an underserved environmental justice community. Therefore, the homeless community that utilizes St. Martin de Porres would be an environmental justice community that is highly vulnerable to change.

Table 3.7-4 Distribution of Sheltered and Unsheltered Homeless Persons in King County/Seattle

Region	Total		Sheltered		Unsheltered	
	% of Individuals	Individuals	% of Individuals	Individuals	% of Individuals	Individuals
East County	9%	1,058	9%	556	8%	446
North County	1%	118	3%	185	1%	56
Northeast County	2%	235	1%	62	3%	167
Seattle	71%	8,343	72%	4,445	67%	3,737
Southeast County	1%	118	1%	62	1%	56
Southwest County	16%	1,880	13%	802	20%	1,116
Total	**100%**	**11,751**	**100%**	**6,173**	**100%**	**5,578**

Table 3.7-5 Demographic Characteristics of Unsheltered Persons compared to Population in King County/Seattle

Environmental Justice Characteristic	Population in King County/Seattle	Homeless Population in King County/Seattle
Male	51%[a]	56%
Over 50	35%[b]	24%
Ethnicity		
White	65%	48%
American Indian, Alaskan Native, or Indigenous	1%	9%
Asian or Asian American	20%	2%
Black, African American, or African	7%	25%
Hispanic Latin(a)(o)(x)	10%	17%
Multiple Races	6%	13%
Native Hawaiian or Pacific Islander	1%	4%
Disability	12.7%[b]	51%

a Census Data Used in Absence of 2022 King County Data. LGBTQ+ data not included in the census but is included in the Point in Time survey.
B 2020 American Community Survey data used in Absence of 2022 King County Data.

NWSA: Port of Seattle and Port of Tacoma

The NWSA organization includes the Ports of Seattle and Tacoma, both located within the SMSA. The NWSA represents one of the largest marine cargo gateways in the U.S. Marine cargo activities (specifically containerized cargo, automobiles, and breakbulk) at the two Ports directly supported 20,100 jobs and $1.9 billion in labor income in 2017. The average annual wage among direct jobs

supported by marine cargo through the NWSA, including benefits, was nearly $95,000. In total, NWSA marine cargo directly supported $5.9 billion in business output in 2017. Factoring in upstream, business-to-business transactions (indirect) and worker earned income household consumption expenditures (induced), NWSA activities supported 58,400 jobs across the State economy. For every direct job in marine cargo activities through NWSA, an additional 1.9 jobs are created throughout the Washington State economy (NWSA 2019).

The NWSA 2021 Annual Trade Report reflects that the Ports have consistently exceeded 3.7 million TEUs of containerized cargo over the period of 2017 through 2021, with the exception of 2020 when the COVID-19 pandemic affected global cargo movements. In 2020, containerized cargo of 3.74 million TEUs carrying 26.1 million metric tons of containerized cargo were handled at the two Ports. As described in the approach to analysis, the TEU is a twenty-foot equivalent unit – the equivalent of a standard cargo container – and is the common measure of capacity at ports.

NWSA's facilities encompass 1,542 acres at the Port of Seattle and 2,402 acres at the Port of Tacoma. A total of 20,100 jobs are attributed to Port activity, including 14,890 jobs associated with containerized cargo and 3,550 jobs associated with terminal operations, stevedoring, and longshoremen. An additional 30,610 secondary jobs (i.e., indirect and induced) are attributed to Port activity. The average annual wage among these direct jobs was $100,700. Total containerized cargo business output comprised $4.5 billion, and labor income was $1.5 billion (NWSA 2019).

By applying these containerized cargo statistics, in 2017 NWSA averaged roughly $1,216 of revenue per TEU, 0.0040 direct jobs per TEU throughput, and 0.0083 secondary jobs per TEU across operations at facilities within its 3,944-acre operating footprint (Community Attributes Inc. 2019). These calculations and methodology are provided in Appendix K.

In addition to job generation, the NWSA, on behalf of the Port of Seattle, leases land. The lease of land generates income for the Port of Seattle. The money generated pays for capital improvement projects, remediation of contamination, and NWSA/Port related jobs.

Terminal 46. Terminal 46 is an approximately 87-acre waterfront terminal designated for alternative maritime use, but currently used primarily for container storage. Terminal 46 serves as a flexible marine transportation facility and is accessed by nine inbound truck access gates and eight outbound gates. Terminal 46 includes berthing space totaling approximately 2,930 feet with a water depth of -50 feet MLLW (NWSA n.d.).

Terminal 46 continues to be marketed for lease for short-term, interim, and long-term marine cargo-related uses, largely in the northern portion of the Terminal, including the following:

- Interlocal Agreement for Cruise: NWSA and Port of Seattle currently have an interlocal agreement for the Port of Seattle's use of the northern 27.5 acres, originally intended for a new cruise berth. Cruise berth plans are on-hold indefinitely, but financial obligations on the acreage between the Port and NWSA remain in place. This is located north of areas proposed for acquisition under any of the action alternatives.
- Pacific Maritime Association (PMA): A 10-year lease from July 1, 2021 to June 30, 2031 that includes 7 acres of terminal yard and office space in the administration building in the northern half of the terminal.
- Maxim Crane Works: A 1-year lease that expired on February 28, 2022.

- Pacific Crane Maintenance Company (PCMC): A month-to-month lease for a container yard in support of Seattle Harbor cargo support. Due to the current shipping crisis, continued use of the terminal yard for container support is anticipated through 2022 and possibly beyond.
- Layberth: The terminal supports layberth opportunities for varying vessels-based on tariff rates for short-term and longer-term layberths.
- Coast Guard: Lease of 18 acres and 1,100 feet of ship berthing space for a period of 39 months executed in July 2022. The lease area is within the area proposed to be acquired under Alternative 1, and a portion of which would be acquired under Alternatives 2 and 3.

Containerized cargo movements represent the greatest and most consistent activity at Terminal 46. TEU throughput at Terminal 46 was 324,222 in 2017, the year of the most recent NWSA economic study (Port of Seattle 2021).

The Port of Seattle previously proposed a new cruise terminal at Terminal 46 to ensure the cruise market and ship deployment facilities would appropriately support existing and projected cruise ship demand (Port of Seattle 2020a). The Port however canceled the request for proposals for the terminal in July 2020.

Terminal 30. Terminal 30 is an approximately 82-acre container terminal accessed via 13 port gates. Terminal 30 includes berth space totaling approximately 2,700 feet with a water depth of -50 MLLW (NWSA n.d.). A lease through 2039 is currently in place for container terminal operations at Terminal 30. TEU throughput at Terminal 30 was 188,635 in 2017 (Port of Seattle 2021).

MITAGS, BNSF Railway, and Belknap Properties. The MITAGS, Belknap, and BNSF Railway properties are three smaller properties adjacent to Base Seattle. Section 2 presents alternatives that propose variations on the future use of these properties by the Coast Guard. MITAGS-West is a maritime training school located on the Port-owned property. The Belknap property is also Port-owned and currently leased by the Coast Guard for parking and storage. The BNSF railway parcel is unoccupied. The Belknap and BNSF Railway properties do not support any community-based services or other economic activities.

3.7.4 Environmental Consequences of the Action Alternatives

Land Acquisition

Common to all three action alternatives, the acquisition of property would result in displacement of Port functions and an associated shift in local economic activity. Property would be withdrawn from Port-controlled activities, and associated employment and ancillary economic benefits would be impacted. The total acreage of displacement of existing Port functions would vary by action alternative. Acquisition of property by the Coast Guard would result in a one-time increase in revenue for the Port of Seattle. The value of the subject property is not known at present and would be determined by appraisal of the subject property and through negotiations between the NSWA and Coast Guard. See Appendix K for calculations used to quantify socioeconomic activity associated with NWSA, Terminals 30 and 46, and Alternatives 1, 2, and 3. A discussion of the impacts of loss of port jobs, revenue, and payroll are discussed in the long-term operations section below.

Regarding environmental justice considerations, land acquisition would result in no adverse impacts on any environmental resource areas that would affect minority or low-income communities—outside of the Base or for the identified acquired properties within Census Tract 93 Block Group 2.

Land acquisition would cause no impacts to the safety or health of children due to the low number of young children within Block Group 2, and lack of nearby areas or facilities where children would gather.

Construction

Under all action alternatives, the local economy would experience direct, short-term, beneficial effects associated with hiring of construction personnel, spending on materials, and local secondary spending associated with these increased activities during construction. While these beneficial impacts would be short-term, they would persist for the approximately six years required to redevelop Base Seattle under all the action alternatives (Table 3.7-6). It is anticipated that the majority of the construction workforce would originate from within the SMSA. As noted in Chapter 1, any in-water work efforts will require further evaluation by the Coast Guard to determine if it constitutes a separate action beyond any required CERCLA removal actions. Therefore, the size, scope, and design of this work is not yet known to the degree that estimates for in-water construction workers and material demand can be estimated. Similarly, short-term, construction-duration materials spending is also anticipated to occur within the Project area.

Table 3.7-6 BaseSeattle Upland Construction Wages by Year

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Construction Jobs	0	34	35	30	46	180	158	88	39	6
Construction Wages	0	$2.5M	$2.6M	$2.3 M	$3.4 M	$13.5 M	$11.8M	$6.6M	$2.9M	$0.0 M

Notes: See Appendix K for calculations; data based on Bureau of Labor Statistics (2021) wage rates for "Construction and Extraction" careers in Seattle-Tacoma-Bellevue ($35.84/hour)

Environmental justice analysis requires the Coast Guard to review and determine whether noted impacts from other resources would have a disproportionately high and adverse impact to a minority or low-income population. As noted above, the population in Census Tract 93 does not exceed the threshold to be considered a disproportionately minority population. Common to all of the action alternatives during construction activities, none of the resource areas analyzed in Chapter 3 would have significant impacts that would result in disproportionately high adverse health or environmental impacts on minority populations within Census Tract 93 Block Group 2. As noted above, all of Census Tract 93 is designated as a low-income population; however, any impacts associated with other resource areas analyzed in Section 3 would not be significant, or high and adverse, and would not disproportionately impact the low-income population. For example, emissions from vehicles and equipment or generation of fugitive dust would occur and be considered adverse. Air quality analyses however have determined that these short-term emissions would remain below *de minimis* levels (refer to Section 3.5) and would not be significant. Similarly, short-term noise generation from these construction activities would not be significant and requirements for construction under the Seattle Noise Ordinance would be observed. Therefore, noise levels would be considered minor (refer to Section 3.9). These construction-related impacts would be expected to occur throughout the Coast Guard property and over time, and would not be concentrated in a way that would have a disproportionate effect on any one area or population. Low-income population associated with the St. Martin de Porres shelter are a particular population within the area that, by virtue of the shelters location, would potentially be disproportionately affected by construction; however, construction would occur in different areas of the Base at different times, and thus would not consistently and disproportionately affect shelter residents, shelter residents are not present during the day when most construction would occur, and the shelter would necessarily be relocated during work on Building 7. And such minor air quality and noise levels would nevertheless not

fall disproportionately on environmental justice communities. Therefore, pursuant to EO 12898, the Coast Guard has determined that construction activities will not cause disproportionately high and adverse impacts on any minority or low-income populations.

Similarly, applying the same analysis to the protection of children from environmental health and safety risks, no significant impacts have been concluded from the resource areas analyzed in this PEIS. This would apply to construction activities associated with all three action alternatives. There are also no concentrations of children in the Project area that could be disproportionately affected. Therefore, pursuant to EO 13045, the Coast Guard has determined that there are no environmental health and safety risks associated with the Proposed Action that would disproportionately affect children.

The temporary closure of the St. Martin de Porres homeless shelter during the seismic retrofit of Building 7 would represent a potentially significant adverse impact to an environmental justice community (see discussion below regarding permanent closure of the shelter in the event Building 7 is demolished). There are 22 homeless shelters currently operating in Seattle, including 10 west of I-5 that are within a 1-mile radius of St. Martin de Porres but the majority of these shelters do not focus on housing elderly men as St. Martin de Porres does. The ability or excess capacity for other shelters to temporarily accommodate the maximum displacement of up to 212 men does not exist in the immediate vicinity in Seattle. The Coast Guard is currently working with USACE regarding their plans to accommodate the shelter during the temporary closure or reconstruction. As the modernization program is implemented, the Coast Guard will provide regular updates to USACE on planned construction plans, schedules and availability of Building 7.

Long-term Operations

Common to all three action alternatives, Base Seattle's long-term operations would involve a reconfiguration of buildings and associated support infrastructure (e.g., security measures, utilities), and permanent redevelopment of existing functions. Impacts on local and regional socioeconomic indicators would be beneficial, as new and upgraded facilities would be more efficient and would eliminate the need for current short-term repairs and renovations within aging facilities. There would generally be a decrease in port generated revenue from container operations. Because there would be a greater increase in personnel that work in the area under all alternatives, a greater generation of revenue would be likely; however, this new revenue would occur in local establishments such as stores, restaurants, and attractions, and would not be used in the same manner as the port container operation revenue.

Job types would shift from container operation jobs to Coast Guard related jobs (Coast Guard enlisted, officers, civilian employees. Therefore, type of jobs lost are not equivalent to the type of jobs gained. Most of the Coast Guard jobs would be occupied by enlisted or officers who are transient in nature. These personnel normally rotate every two years. These jobs would not normally be open to Seattle and King County residents unless the residents applied to be in the Service.

Based on the assumption that Building 7 would be refitted to meet seismic standards, it is anticipated that the St. Martin de Porres homeless shelter functions would resume following completion of improvements to Building 7. If further engineering evaluation determines that Building 7 must be replaced, the availability of space at Base Seattle to accommodate homeless shelter needs would require further coordination between the Coast Guard and USACE. In accordance with 10 USC §2556, USACE has authority to make military installations available for sheltering of persons without adequate shelter. Services that may be provided include renovation of facilities, minor repairs, utilities, bedding, security, transportation, and liability insurance; however, the authority does not include purchase or

construction of new facilities. This authority cannot be used by the Coast Guard. Consequently, should Building 7 be demolished, the shelter could only be relocated by the USACE to an existing military facility. The USACE is currently working to identify any potential suitable locations for relocation of the shelter. Renovation would present a short-term impact, whereas demolition may cause a long-term impact to an environmental justice community. Renovation or demolition of Building 7 would represent a potentially significant adverse impact to an environmental justice community, especially if the USACE is unable to temporarily or permanently relocate the facility.

Under all action alternatives, increased personnel would be assigned to Base Seattle, which would increase general economic activity and secondary spending and employment that would be beneficial in neighboring communities. Direct employment of Coast Guard personnel is expected to increase from the baseline of 1,140 to approximately 1,900. Existing Coast Guard personnel assigned to Base Seattle are divided between those assigned to cutters, the Base, and collocated units. Personnel increases with the redevelopment of Base Seattle are expected to be distributed similar to the present distribution (see Table 3.7-7).

Table 3.7-7 Base Seattle Personnel Levels over Time

Personnel Assignments	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Cutter	390	390	473	544	662	733	733	686	799	899
Base Staff	199	199	241	277	337	374	374	349	458	458
Collocated Units	236	236	283	329	400	443	443	415	543	543
Total	825	825	1,000	1,150	1,400	1,550	1,550	1,450	1,800	1,900

The total wages, not including additional stipends for food and other necessities, for Coast Guard personnel at Base Seattle are estimated over time based on expected increases in assignments, dividing personnel between the enlisted and officer ranks (based on average distribution throughout the Coast Guard), and annual wages for enlisted personnel and officers (see Table 3.7-8). Estimated total wages for Coast Guard personnel are expected to increase by approximately $65 million from approximately $50 to $115 million.

Table 3.7-8 Estimated Base Seattle Coast Guard Wages by Year ($M)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Base Seattle Personnel	825	825	1,000	1,150	1,300	1,450	1,550	1,550	1,450	1,800	1,900
Enlisted	660	660	800	920	1,040	1,160	1,240	1,240	1,160	1,440	1,520
Enlisted Wages	$30.0	$30.0	$36.4	$41.9	$47.3	$52.8	$56.4	$56.4	$52.8	$65.5	$69.2
Officer	165	165	200	230	260	290	310	310	290	360	380
Officer Wages	$19.7	$19.7	$23.8	$27.4	$31.0	$34.6	$36.9	$36.9	$34.6	$42.9	$45.3
Total Wages	$49.7	$49.7	$60.2	$69.3	$78.3	$87.3	$93.4	$93.4	$87.3	$108.4	$114.5
Change in Wages[1]	-	+$0	+$10.5	+$19.6	+$28.6	+$37.6	+$43.7	+$43.7	+$37.6	+$58.7	+$64.8

1Annual estimated wage increases compared to 2023 baseline value
Notes: Enlisted/Officer ratio is assumed to be approximately 80/20 based on total Coast Guard personnel from Bureau of Labor Statistics and average pay for enlisted/officers from https://www.federalpay.org/military/coast-guard.

Housing would not be adversely affected by implementation of any action alternative. The existing Coast Guard personnel at the Base and the Federal Building are already residents in the SMSA. While the exact location that new personnel would choose to live cannot be predicted, it is assumed that the distribution would be throughout the SMSA, similar to the current distribution of personnel. Rental vacancy rates in the SMSA area are approximately 4.42 percent. Within the City of Seattle alone, a total of approximately 156,000 rental units are registered (City of Seattle 2022). Applying the vacancy rate of 4.42 percent would yield approximately 6,900 vacant housing units.

Increased vessel calls to Base Seattle would require increased contractor support to facilitate annual sustainment (i.e., resupply and maintenance) efforts for each vessel. These contractor positions would include shoreside and shipboard tradespersons conducting maintenance activities including electricians, mechanics, riggers, crane operators, painters, etc. Sustainment activities for each vessel are expected to require approximately 65 business days per rotation (one business quarter). The annual tempo of sustainment activities is expected to increase as new PSCs and other major cutters are assigned to Base Seattle (see Figure 2-1). Therefore, demand for vessel maintenance and sustainment contractor support is expected to increase.(Table 3.7-9).

Table 3.7-9 Annual Coast Guard Sustainment Contractor Wages

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Cutter HEALY Sustainment Events	1	1	1	1	1	1	1	1	1	1
Cutter HEALY Contractor Hours	520	520	520	520	520	520	520	520	520	520
PSC Sustainment Events	0	0	0	1	2	3	3	3	3	3
PSC Contractor Hours	0	0	0	520	1,040	1,560	1,560	1,560	1,560	1,560
Major Cutter Sustainment Events	0	0	0	0	0	1	2	2	3	4
Major Cutter Contractor Hours	0	0	0	0	0	520	1,040	1,040	1,560	2,080
Total Contractor Hours	520	520	520	1,040	1,560	2,600	3,120	33,120	3,640	4,160
Sustainment Contractor Wages	$3.6M	$3.6M	$3.6M	$7.2M	$10.8M	$19.4M	$23.3M	23.3M	$26.6M	$30.0M
Change in Sustainment Contractor Wages	-	-	-	$3.6M	$7.2M	$15.8M	$19.7M	$19.7M	$23.0 M	$26.4M

Beyond additional wages generated by increased Base Seattle personnel and contractors, it is expected that government spending would generate additional, secondary jobs in the local economy. These induced jobs were estimated by using the ratio of 0.84 job/$100,000 of annual defense spending (Auerbach, Gorodnichenko, and Murphy 2019) (Table 3.7-10). Induced job numbers may however not be of the same type. Once redeveloped Base Seattle reaches full staffing, it would be expected to create approximately 766 indirect jobs in the Seattle area.

Generally, contractor jobs and construction jobs may not have an equivalent impact on the local economy. It is not unusual for construction workers and vessel sustainment contractors to come from other areas of the U.S. and temporary relocate to a region during the completion of the work, and either leave every weekend or leave after a short amount of time.

Table 3.7-10 Secondary Job Creation due to Increased Base Seattle Coast Guard Staffing

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Total Coast Guard Direct Wage Change[1] ($M)	0	$0	$10.5	$23.2	$35.8	$53.4	$63.4	$63.4	$60.6	$85.1	$91.2
Resultant Secondary Jobs in SMSA	0	0	88	195	301	449	533	533	509	714	766

[1]Total change in wages includes increased Coast Guard staffing and vessel sustainment contractor

3.7.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

The implementation of Alternative 1 would result in the acquisition of land at Terminal 46 and the resultant cessation of Port cargo functions at this location. Although there are areas that may be available for this activity to move to within the Port, relocation cannot be guaranteed, and therefore it is likely the loss of acreage would correlate to a direct loss in income generation for the Port. Three potential scenarios for acquiring land are considered as viable under Alternative 1; (1) acquire 26 acres at Terminal 46, (2) acquire 34 acres at Terminal 46 (an additional 8 acres to provide space should Building 7 be demolished and new construction is required), and (3) acquire 53 acres at Terminal 46 (the whole of the area offered for lease by the Port in 2019). As described previously, a loss of acreage is assumed to directly correspond to a loss in TEU throughput capacity, and therefore a direct loss in revenue. Table 3.7-11 summarizes the projected reduction in economic activity associated with the permanent loss of 26 acres and 53 acres of Terminal 46 from the NWSA inventory, and the resultant NWSA-wide activity following such withdrawal (also refer to Section 3.7.2 and Appendix K). Implementation of Alternative 1 with 26 acres acquired is estimated to result in the loss of 24,086 TEUs – a 0.7 percent reduction – and the loss of 97 direct Port jobs and 199 secondary jobs based on 2017 levels. The loss of 97 direct Port jobs represents a loss of $9.8 million in Port payroll. Implementation of Alternative 1 with 53 acres acquired is estimated to result in the loss of 49,099 TEUs – a 1.4 percent reduction – and the loss of 198 direct Port jobs and 406 secondary jobs based on 2017 levels. The loss of 198 direct Port jobs represents a loss of $19.9 million in Port payroll. Table 10 in Appendix K provides similar analysis tables based on acquired property of 34 acres acquired at Terminal 46.

As shown in Table 3.7-11, the increase in Coast Guard direct payroll would be $10.5M in 2025 and would continue to increase as additional cutters arrive and associated sustainment contractors are employed at Base Seattle. The estimate for direct jobs created by the completion of the Coast Guard modernization program would be greater than the estimated direct jobs lost from the reduction in Port-related activities(Tables 3.7-8 through 3.7-10). New jobs created by Coast Guard activities would not be of the same type that would be displaced at Terminal 46 and there would be a reduction in direct jobs and secondary jobs associated with cargo handling operations at Terminal 46 (Table 3.7-11). While jobs displaced at Terminal 46 may be offset by job opportunities at other terminals within NWSA, it is expected that Port-related jobs at Terminal 46 would be reduced. Thus, while the creation of direct and

secondary jobs and payroll associated with the Coast Guard modernization program would be a long-term moderate benefit to the local economy, Alternative 1 would result in the loss of specific jobs associated with Port operations.

Table 3.7-11 Impacts on NWSA Economic Activity under Alternative 1

Economic Metric	Reduction Attributed to Acquired Property		Estimated NWSA-wide Level Accounting for Reduction		Generated by Coast Guard under Alternative 1	Net Change	
Amount of Land Acquired	26 Acres	53 Acres	26 Acres	53 Acres	26-53 Acres	26 acres	53 acres
Capacity expressed as TEUs	-24,086	-49,099	3,675,914	3,650,901	N/A	N/A	N/A
# of Direct Jobs	-97	-198	14,793	14,692	1,075	978	877
# of Secondary Jobs	-199	-406	30,411	30,204	2,042	1,843	1,636
Direct Payroll ($M)	-$9.8	-$19.9	$1,490.2	1,480.1	64.75	54.95	44.85
Secondary Payroll ($M)	-$11.1	-$22.6	$1,688.9	1,677.4	N/A	N/A	N/A
Direct Revenue ($M)	-$29.3	-$59.7	$4,470.7	4,440.3	N/A	N/A	N/A
Secondary Revenue ($M)	-$33.9	-$69.0	$5,166.1	5,131.0	N/A	N/A	N/A

Note: See Appendix K for calculations; data based on NWSA 2019.

There would be an adverse effect due to the Proposed Action introducing different types of jobs than the jobs lost. This is because the types of Port-related jobs lost are not necessarily the same types of jobs created under the Coast Guard's Proposed Action. While the monetary value of direct employment would be an offset to the local economy, it is not possible to say that the new jobs would offset the loss because it it is not guaranteed that workers that lose jobs could occupy new jobs, or that jobs would necessarily go to workers in the Seattle area. The number of secondary jobs resulting from the Coast Guard growth in direct jobs would be greater than the number of secondary jobs lost resulting from the reduction of Port-related jobs, resulting in a beneficial impact within the SMSA.

In addition to the job loss that would impact one sector, the NWSA would lose rental income generation for 53 acres and 2 berths of container operational space. This amount cannot be appropriately quantified because it depends upon market prices and negotiated rates. It is expected however that this could be millions of dollars a year in gross revenue proportional to each alternative. Over time, the lost gross revenue could be substantial.

Therefore, pursuant to NEPA, significant impacts would be expected on socioeconomic resources. Impacts on environmental justice are discussed under Land Acquisition and Construction above.

3.7.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

Alternative 2 includes the acquisition of approximately 5.5 acres of Terminal 46 and 13.5 acres of Terminal 30, or a total of 19 acres of terminal land, displacing the operations in these areas and

precluding future Port economic activities. Should Building 7 require demolition and replacement, the Coast Guard would require an additional 8 acres, or 21.5 total acres, at Terminal 30, for a total of 27 acres of terminal land. Both Terminals 30 and 46 are analyzed as cargo terminals in this analysis to identify potential maximum economic impacts under this alternative. Table 3.7-12 summarizes the projected reduction in economic activity associated with the permanent withdrawal of Terminal 30 and Terminal 46 acreage from the NWSA inventory and the resultant NWSA-wide activity following such withdrawal (see Appendix K for additional detailed calculations). Implementation of Alternative 2 with 19 acres acquired is estimated to result in the loss of 17,601 TEUs – a 0.5 percent reduction – and the loss of 71 direct Port jobs and 146 secondary jobs based on 2017 levels. The loss of 71 direct Port jobs represents a loss of $7.1 million in Port payroll. Implementation of Alternative 2 with 27 acres acquired is estimated to result in the loss of 25,013 TEUs – a 0.7 percent reduction – and the loss of 101 direct Port jobs and 207 secondary jobs based on 2017 levels. The loss of 101 direct Port jobs represents a loss of $1.5 million in Port payroll. This estimated percentage reduction in socioeconomic conditions for NWSA activity represent a long-term, adverse impact.

Under Alternative 2, the MITAGS-West school would be displaced. Without identification and implementation of a replacement facility, displacement of the school would be a long-term and adverse impact. There would be short-term,impacts due to the anticipated costs associated with relocation of the school.

Table 3.7-12 Impacts on NWSA Economic Activity under Alternative 2

Economic Metric	Reduction Attributed to Acquired Property		Estimated NWSA-wide Activity Accounting for Reduction		Generated by Coast Guard under Alternative 2	Net Change	
Amount of Land Acquired	19 Acres	27 Acres	19 Acres	27 Acres	19-27 Acres	19 Acres	27 Acres
Capacity expressed as TEUs	-17,601	- 25,013	3,682,399	3,674,987	N/A	N/A	N/A
# of Direct Jobs	-71	-101	14,819	14,789	1,075	1,004	974
# of Secondary Jobs	-146	- 207	30,464	30,403	2,042	1,896	1,835
Direct Payroll ($M)	-$7.1	-$10.1	$1,492.9	$1,489.9	$64.75	$57.65	$54.65
Secondary Payroll ($M)	-$8.1	-$11.5	$1,691.9	$1,688.5	N/A	N/A	N/A
Direct Revenue ($M)	-$21.4	-$30.4	$4,478.6	$4,469.6	N/A	N/A	N/A
Secondary Revenue ($M)	-$24.7	-$35.2	$5,175.3	$5,164.8	N/A	N/A	N/A

Notes: See Appendix K for calculations; data based on NWSA 2019.

The calculated increase in Coast Guard direct jobs would be greater than the calculated reduction in Port-related employment due to Alternative 2 acquired land at Terminals 46 and 30. As shown in Table 3.7-12, the increase in Coast Guard direct payroll would be $10.5M in 2025 and would continue to increase as additional cutters arrive and associated sustainment contractors are employed at Base Seattle. Due to the Coast Guard increase in Base Seattle direct jobs, the number of secondary jobs within the SMSA would be greater than the number of secondary jobs lost due to the reduction in Port-related jobs due to land acquisition resulting in a long- term beneficial impact to secondary jobs.

New jobs created by Coast Guard activities would not be of the same type that would be displaced at Terminal 46 and 30. Port-related jobs at Terminal 46 and 30 would be reduced. The estimated reductions to socioeconomic conditions for NWSA activity represent long-term, adverse impacts. Therefore, significant impacts on socioeconomic resources would be expected under Alternative 2 pursuant to NEPA. Impacts on environmental justice would be the same as those discussed under Land Acquisition and Construction above.

3.7.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

The implementation of Alternative 3 would include the acquisition of less than 22 acres of Terminal 46. However, should the demolition and replacement of Building 7 be necessary, the Coast Guard proposes acquiring 8 additional acres, or a total of 30 acres, at Terminal 46. Table 3.7-13 summarizes the projected reduction in economic activity associated with the permanent withdrawal of 21.75 acres or 30 acres at Terminal 46 from the NWSA inventory and the resultant NWSA-wide affects following the proposed land acquisition for Alternative 3. Implementation of Alternative 3 with 22 acres acquired is estimated to result in the loss of 20,149 TEUs – a 0.6 percent reduction – and the loss of 81 direct Port jobs and 167 secondary jobs based on 2017 levels. The loss of 81 direct Port jobs represents a loss of $8.2 million in Port payroll. Implementation of Alternative 3 with 30 acres acquired is estimated to result in the loss of 27,560 TEUs – a 0.7 percent reduction – and the loss of 111 direct Port jobs and 228 secondary jobs based on 2017 levels. The loss of 111 direct Port jobs represents a loss of $11.2 million in Port payroll. Detailed calculations for both property acquisition scenarios associated with Alternative are shown in Table 12 in Appendix K. The estimated percentage reductions to socioeconomic conditions for NWSA activity represents a long-term, adverse impact.

The relocation of the MITAGS-West school from its current site would incur the same projected impacts noted for Alternative 2.

The calculated increase in Coast Guard direct jobs would be greater than the calculated reduction in Port-related employment due to Alternative 3 acquired land at Terminal 46. Due to the Coast Guard increase in Base Seattle jobs, the number of secondary jobs within the SMSA would be greater than the number of secondary jobs lost due to the reduction in Port-related jobs due to land acquisition resulting in a long-term beneficial impact within the SMSA.

New jobs created by Coast Guard activities would not be of the same type that would be displaced at Terminal 46. Port-related jobs at Terminal 46 would be reduced. The estimated reductions to socioeconomic conditions for NWSA activity represent long-term,adverse impacts. Therefore, under Alternative 3, there would be significant impacts on socioeconomic resources pursuant to NEPA. Impacts on environmental justice are discussed under Land Acquisition and Construction above.

Table 3.7-13 Impacts on NWSA Economic Activity under Alternative 3

Economic Metric	Reduction Attributed to Acquired Parcel		Estimated NWSA-wide Activity Accounting for Withdrawal		Generated by Coast Guard under Alternative 3	Net Change	
Amount of Land Acquired	22 Acres	30 Acres	22 Acres	30 Acres	27-30 Acres	22 Acres	30 Acres
Capacity expressed as TEUs	-20,149	-27,560	3,679,851	3,672, 440	N/A	N/A	N/A
# of Direct Jobs	-81	-111	14,809	14,779	1,075	994	964
# of Secondary Jobs	-167	-228	30,443	30,382	2,042	1,875	1,814
Direct Payroll ($M)	-$8.2	-$11.2	$1,491,8	$1,488.8	$64.75	$56.55	$53.55
Secondary Payroll ($M)	-$9.3	-$12.7	$1,690.7	$1,687.3	N/A	N/A	N/A
Direct Revenue ($M)	-$24.5	-$33.5	$4,475.5	$4,466.5	N/A	N/A	N/A
Secondary Revenue ($M)	-$28.3	-$38.7	$5,171.7	$5,161.3	N/A	N/A	N/A

Notes: See Appendix K for calculations; data based on NWSA 2019.

3.7.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, the Coast Guard would not implement facility modernization requirements and infrastructure enhancements and Base Seattle would not be upgraded to make it a suitable location for future cutters. No additional lands would be acquired from Port properties (e.g., Terminals 30 and/or 46) and the Port would retain access to future development options and economic opportunities. The Coast Guard would continue to lease the Belknap property from the Port. The recently enacted 39-month lease of a portion of Terminal 46 and associated berthing would likely continue through to its expiration date. The NWSA would also collect rent from Terminals 30 and 46. The beneficial impacts related to short-term construction staffing and spending and long-term increased Coast Guard employment would not occur under the No-Action Alternative. There would be no significant impacts to socioeconomics under the No-Action Alternative.

3.7.6 Comparison of Alternatives

Implementation of Alternative 1 would result in the greatest adverse impact with respect to estimated reductions in of NWSA jobs resulting from termination of Port functions and change in ownership as compared to Alternatives 2 and 3. This is based on Alternative 1 resulting in the greatest loss of Port square footage, as detailed above, which results in the greatest estimated reduction in jobs and economic impact of the Port. Under Alternatives 2 and 3, the MITAGS-West school would be displaced. Without identification and implementation of a replacement facility, displacement of the school would be a long-term and adverse impact. There would be short-term impacts due to the anticipated costs associated with relocation of the school.

Across all action alternatives, there would be a loss of revenue attributable to the NWSA being unable to lease the property. This loss of revenue would be relatively proportional and would most likely be

millions of dollars per year. While the NWSA would be compensated for acquisition of the land, it would not be able to be compensated for all possible revenues. Therefore, the income generated from the sale of the land would be immediately beneficial. As time progresses, the amount of revenue lost from rental income would surpass that of the revenue gained from the acquisition.

All other potential impacts on socioeconomic resources and environmental justice, including the short- and long-term beneficial impacts resulting from increased Coast Guard and contractor employment would remain consistent across all alternatives. Pursuant to NEPA, there would be significant impacts on socioeconomics from the action .alternatives Pursuant to EO 12898 and 13045, potentially significant impacts would be expected to environmental justice communities under all action alternatives. The No-Action alternatives would result in no significant impacts to socioeconomics or environmental justice communities.

Table 3.7-14 Comparison of Alternatives for Socioeconomics and Environmental Justice

Comparison of Alternatives for Socioeconomics and Environmental Justice	
Alternative 1	Significant impacts to socioeconomics; potentially significant impacts to an environmental justice community.
Alternative 2	Significant impacts to socioeconomics; potentially significant impacts to an environmental justice community.
Alternative 3	Significant impacts to socioeconomics; potentially significant impacts to an environmental justice community.
No-Action Alternative	No significant impacts.

3.7.7 Environmental Conservation Measures

No ECMs in Appendix E directly relate to the minimization or avoidance of socioeconomic impacts. In the consideration of environmental justice, the ECMs that apply to other resource areas analyzed are taken into consideration.

3.8 Cultural Resources

Summary of Findings

The Proposed Action and its Action Alternatives, and the No-Action Alternative, are anticipated to have no impacts on historic built-environment resources. Alternatives 1 and 3 and the No-Action Alternative are anticipated to have no impacts on archaeological resources. Alternative 2 may contain a potential archaeological resource that would require documentation and evaluation if the alternative is selected.

Impacts to U&A resources would occur under the Proposed Action and Action Alternatives from increases in the number of vessels being moored. No impacts are anticipated on U&A resources under the No-Action Alternative.

3.8.1 Background

There are three primary categories of cultural resources: archaeological resources, historic built-environment resources, and properties of religious and cultural significance (including traditional cultural properties [TCP] and traditional cultural landscapes [TCL]). Under the National Historic Preservation Act (NHPA) and its implementing regulations, the term "historic property" is applied to any archaeological or historical district, site, building, structure, object, or traditional cultural place that is eligible for inclusion or listed in the National Register of Historic Places (NRHP) (36 CFR §800.16[1]).

Archaeological resources can include isolated artifacts, features above or below ground, sites, and districts that generally date to 50 years old or older. Archaeological resources may be divided into two general time periods: historic and pre-contact. Historic period archaeological resources are those resources that date from 50 to approximately 250 years ago and pre-contact period archaeological resources generally date to from 250 to circa 12,000 years ago. *Pre-contact* is used in this document rather than *prehistoric* to recognize that the lack of written record does not indicate that people did not have a history prior to Euroamerican contact.

Historic built-environment resources include buildings, structures, objects, sites, and districts that generally date to activities within the last 50 to 250 years and typically reflect human construction and activities from this period (sometimes referred to as "architectural" or the "historic built-environment," but are not limited to architectural elements). Historic resources in ruin (e.g., collapsed structures, foundations) are considered historic period archaeological sites. NRHP-eligible historic districts are those that represent a significant and distinguishable entity whose components (individual resources) may lack individual distinction (NPS 1997).

Properties of religious and cultural significance are resources associated with cultural practices or beliefs of a living community rooted in that community's history, and important in maintaining the continuing cultural identity of the community (Parker and King 1998). Properties of religious and cultural significance include TCPs, which are those properties that are eligible for listing in the NRHP. TCPs can be either tangible resources (containing physical evidence) or intangible (without any man-made physical features).

The Treaty of Point Elliott, signed between many Indian tribes and the federal government, explicitly guarantees hunting and fishing rights on land and in waters within and outside of the jurisdiction of

reservations. Fishing areas that are located off-reservation are referred to as usual and accustomed (U&A) fishing grounds. The reserved rights of the tribes to gather, hunt, and fish are both cultural and economic in nature. Tribal interests and resources included in the analysis below.

3.8.2 Approach to Analysis

The Project area for cultural resources analyses includes Base Seattle, neighboring Port of Seattle Terminals 46 and 30, Jack Perry Memorial Park, and other potentially acquired property (e.g., MITAGS, Belknap, BNSF Railway) that could be affected under the three action alternatives (see Figures 2.5-2, 2.5-3, and 2.5-4). A 0.25-mile radius buffer was applied around the Project area for background research purposes to provide context and history for the analysis. Summaries of consultation efforts to date are included in Appendix I.

This analysis considers known cultural resources within the Project area, which is the combined footprint of all alternatives (see Figures 2.5-2, 2.5-3, and 2.5-4). In addition, the Coast Guard will establish the project's impact area, or Area of Potential Effects (APE), for the Preferred Alternative and will consult with the appropriate parties as required by Section 106 of the NHPA for this alternative. For the purposes of discussion in this PEIS, "impacts," as defined by NEPA, and "effects" to cultural resources, as defined by Section 106, are generally considered synonymous. Under NEPA, the human environment includes all cultural resources, not just those eligible for or listed in the NRHP. Potential impacts on cultural resources within the Project area were evaluated pursuant to both NEPA and NHPA by determining the type and length of proposed activity under each of the alternatives within proximity to any known cultural resources.

Under 36 CFR §800.5(a)(1), an adverse effect "is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that it would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." Adverse effects may include "reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative." 36 CFR §800.5(a)(2)(v) also identifies potential adverse effects as those that introduce "visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features." A finding of "no adverse effect" can be made by the permitting agency if the proposal for the undertaking is modified, or if conditions are imposed to minimize or avoid effects (36 CFR §800.5[b]). In contrast, a finding of "adverse effect" requires that the permitting agency work with consulting parties to agree on a resolution to avoid, minimize, or mitigate the adverse effect(s). This process may result in the development of a signed memorandum of agreement (MOA) or programmatic agreement (PA) to record the agreed-upon measures to resolve adverse effects.

Impacts on cultural resources result from actions that change culturally valued elements of a resource, affect the historic or archaeological data potential of a resource, or restrict access to cultural resources. Impacts on cultural resources may be short-term or long-term and direct or indirect. Direct impacts can result from physically altering, damaging, or destroying all or part of a resource. Indirect impacts can occur from alterations to characteristics of the surrounding environment that contribute to the importance of the resource or introducing visual, atmospheric, or audible elements that are out of character with the property or that alter its setting or feeling. Actions may have beneficial impacts if they improve the preservation of cultural resources or their historic settings. Impacts are evaluated to determine if they may change a cultural resource, such as by altering a resource in a way that renders it ineligible for listing in the NRHP, if it blocks or greatly affects access to a resource, or if it substantially affects the relationship between a resource and an affiliated cultural group's practices and beliefs.

Cultural resources background records were reviewed at the Coast Guard files, NRHP, and the Washington Information System for Architectural & Archaeological Records Data (WISAARD), which is administered by the Washington Department of Archaeology and Historic Preservation (DAHP). Records checked include archaeological site forms, historic property inventory forms, TCPs, NRHP-listed historic properties, determinations of eligibility, cemeteries, and historic maps. WISAARD also contains a predictive model showing the risk for encountering archaeological resources. This analysis uses currently available information to identify the likelihood that historic-age properties located within Base Seattle have the potential to be found eligible for listing in the NRHP (see Table L-1 in Appendix L for cultural resources definitions). Within this analysis, buildings and structures that lack formal eligibility determinations and evaluations have been recommended for formal NRHP evaluation using the criteria defined in the NHPA (54 U.S.C. 306108). The results of formal eligibility determinations, which are currently underway, could change the NRHP eligibility status of the buildings on Base Seattle.

Some information on topics regarding historic properties addressed in this section is considered sensitive and confidential and is protected from disclosure by federal laws regarding archaeological and cultural resources (e.g., 16 U.S.C 470hh and 36 CFR §296.18). Privileged and confidential information, such as the location of archaeological sites, is not included in this public document.

Tribal interests and resources were reviewed at publicly available data sources, websites, treaties, and case law. Under the U.S. Constitution, treaties are accorded precedence equal to federal law and treaty rights are binding on all federal and state agencies. Treaties take precedence over state constitutions, laws, and judicial decisions. Treaties with Indian Tribes cannot be impaired or abrogated except by an Act of Congress.

The Coast Guard entered into an interagency Memorandum of Understanding with the Advisory Council on Historic Preservation (ACHP) in 2021 to affirm their commitment to protect tribal treaty rights, reserved rights, and similar rights to natural and cultural resources (ACHP 2021). To meet their constitutional obligation to uphold treaties, the Coast Guard is offering government-to-government consultation with federally recognized Indian tribes to further identify tribal interests and resources within the Project area and to determine the degree of impact and potential strategies to avoid, minimize, or mitigate those impacts on tribal interests and resources, including U&A fishing grounds. The Coast Guard considers the Tribes to be the most authoritative sources of information regarding their own fishing practices.

As part of their federal trust responsibility, the Coast Guard must examine in the context of existing information, law, and policy to determine whether the Proposed Action would abrogate a treaty right. Potentially relevant information regarding whether the Proposed Action would abrogate a treaty right relates to the specific Proposed Action impacts on the reserved treaty right regarding: (1) the geographic right of access to the U&A fishing grounds, (2) degradation of fish runs and habitat, and (3) other treaty issues, as applicable. If the Proposed Action would obstruct, eliminate, or interfere with a Tribe's access to its U&A fishing grounds to such an extent that the Tribe's reserved treaty fishing right will be impermissibly impaired, the Coast Guard does not have the authority to construct the Proposed Action in the absence of a specific statutory authorization from Congress.

3.8.3 Affected Environment

Regional Setting

The Project area is at the mouth of the Duwamish River within the Elliott Bay tidal flats, which were filled in with spoils from dredging and ship ballast dumping as early as 1895. Beginning in 1913, the

Duwamish River was straightened, and included extensive hillside cutting and regrading, dredging navigational channels, filling shallow habitat, and shoreline hardening. According to the Washington Department of Natural Resources' (DNR) Interactive Geologic Map, the Project area lies within Quaternary unconsolidated or semi consolidated alluvial clay, silt, sand, gravel and/or cobble deposits, also referred to as modified lands and artificial fill (Washington DNR 2019). The USDA NRCS Soil Data Explorer does not contain any soil data for the Project area due to the modified built landscape (NRCS 2019). Today, the Project area is situated within a highly modified, industrialized landscape currently used for industrial purposes.

Regional Cultural Resources Setting

The Project area is located within the traditional territory of the *Dxʷdəwʔabš* (Duwamish), a Puget Salish or Lushootseed speaking group (Gillis et al. 2005; Duwamish Tribal Services 2018). The *Dxʷdəwʔabš* lived in winter villages on the shoreline of Elliott Bay, Lake Washington, Lake Union, and the Duwamish, Black, and Cedar Rivers (Petite 1954; United States Court of Claims 1927; Waterman et al. 2001). Close neighbors to the *Dxʷdəwʔabš* were the Muckleshoot (formerly known as Green River and White River people) and Suquamish, who likely camped together at fishing locales on Elliott Bay and the Duwamish River (Gillis et al. 2005; Lane 1987). Today, many Duwamish descendants have chosen to become members of the Muckleshoot Indian Tribe, Snoqualmie Indian Tribe, Suquamish Tribe, and the Tulalip Tribe, all of whom are federally recognized, while others continue to seek independent Duwamish tribal status. The Duwamish Tribe is not currently federally recognized.

Tribal Interests and Resources. The Washington Territory was organized on behalf of the United States in 1853 and the Treaty of Point Elliott, ratified in 1859, was signed by the Duwamish, Suquamish, Snoqualmie, Snohomish, Lummi, Skagit, Swinomish and other tribes on January 22, 1855. One of the Snoqualmie Indian chiefs signed in the name of the Stillaguamish, Snohomish, and Snoqualmie Indians (12 Stat. 971). The Treaty of Point Elliot resulted in the Indian tribes ceding thousands of acres of lands to the federal government in exchange for reservations and guaranteed perpetual access to ancestral fishing, hunting, and gathering sites, referred to as U&A grounds. The Project area is within a geographic area subject to Article 5 of the Treaty of Point Elliott. Article 5 preserves the rights of the Indian tribes to access their U&A fishing grounds.

During the 1960s and 1970s, State laws attempted to limit Indian fishing to only reservation lands. In response, Indian fishers organized a movement grounded in "fish-ins" and public education to challenge these continued threats to their treaty fishing rights. The fishers were faced with harassment, violence, and arrest, events that are referred to as the Fish Wars. These Fish Wars were pivotal in enforcing treaty fishing rights at U&A locations. Ultimately, the Indian tribes turned to the courts to uphold their treaty rights.

The Tribes' reserved rights were reaffirmed in 1974 (and upheld in 1979) during a United States vs. Washington court case that became known as the Boldt Decision, named for trial court judge, George Hugo Boldt. This case reaffirmed the right of the Indian tribes in Washington State to co-manage salmon and other fish with the state and to also continue harvesting fish in accordance with the various treaties. Today, the Indian Tribes in Washington State co-manage salmon and other fish with the state and to also continue harvesting fish in accordance with the various treaties (384 F. Supp. 312, W. Dist. WA, [1974]).

Multiple Tribes hold adjudicated fishing rights in the Duwamish Waterway, East Waterway, West Waterway, and Elliot Bay, including the Muckleshoot Indian Tribe and Suquamish Tribe. The

Confederated Tribes and Bands of the Yakama Nation are not known by the Coast Guard to actively fish in the area. For purposes of the Treaty, the term "fish" includes both anadromous fish and naturally occurring shellfish beds. Treaty protection applies throughout the U&A fishing grounds, regardless of continuous fishing. Fishing locations within a U&A fishing ground can change over time as fish populations and environmental conditions change, but the geographic scope of the U&A fishing grounds remains fixed. Much of the original area of the U&A fishing grounds was destroyed when Harbor Island was built and when the East Waterway was filled.

Fish and shellfilsh have always played a very important role in Indian tribal economy and culture since time immemorial, including both subsistence and ceremonial practice. Tribes have historically harvested, currently harvest, and intend to harvest fish and shellfish in the future within their U&A fishing grounds.

Base Seattle Historic Context. The Project area was first developed with the establishment of Pier 36, built in 1925 by the Pacific Steamship Company, who also constructed Building 1. The federal government acquired the location in 1940 for use as a regional port of embarkation. Pier 37 was constructed in 1941 to expand port facilities. In 1960, the facility was transferred to USACE and used as their district headquarters. In 1965, the Port of Seattle took title to both piers. In 1966, the Coast Guard acquired the Pier 36 complex from USACE, allowing a home for all Seattle-based units and their support facilities that were scattered across Seattle (USCG 2021).

In 1999, as noted in Washington State Historic Preservation Officer (SHPO) documentation, the Coast Guard took ownership of the Building 7 warehouse from USACE, and has been using and renovating the building as necessary since that time for office and logistical uses (Sheridan 2008). The Pacific Steamship building (Building 1) remains the hub for business at the facility.

Previously Completed Cultural Resources Investigations. Eighteen previous investigations (studies) have been completed within the 0.25-mile radius buffer, two of which overlap the Project area (see Table L-2 in Appendix L). The two surveys that overlap the Project area, which are described here to provide greater context for previous built-environment resource evaluations that have occurred in the vicinity, include a historic built -environment resources survey for the Alaska Way Viaduct and Seawall Replacement program in 2008, and monitoring for the SR 99 South Holgate Street to South King Street Viaduct Replacement project in 2012. The survey for the Alaska Way Viaduct and Seawall Replacement program identified and assessed potential effects on historic built-environment resources that could result from replacement of the viaduct and seawall with an improved three-lane roadway including the NRHP-eligible Bemis Building and the viaduct (Sheridan 2008). The monitoring completed for the viaduct and seawall replacement project identified isolated historic archaeological materials and features within debris fill, and a single human bone fragment, none of which were determined to be eligible for the NRHP (Reed at al. 2012).

Archaeological Resources. The predictive model available in WISAARD indicates that the Project area has a very high risk for containing archaeological resources. Given the historical disturbance to the vicinity, shallow archaeological resources are likely disturbed and historic in age. As described in Section 3.2.3, *Geological Resources Affected Environment*, Base Seattle and the surrounding area has been raised and leveled with artificial fill historically deposited on natural tideflat deposits. Due to the historical development of the area, in-situ precontact archaeological resources are likely deeply buried, if present. There are no previously recorded archaeological resources within the Project area.

There are four previously documented archaeological resources within the 0.25-mile radius buffer, which provide context as to the types of archaeological resources that may occur within the Project area (see Table L-3 in Appendix L). One of these recorded sites has been determined eligible for listing in the NRHP (45KI00924, Dearborn South Tideland Site), which consists of a portion of the historic SODO neighborhood and Industrial District built on the filled tideflats. Two of the previously documented archaeological sites have been determined not eligible for listing in the NRHP (45KI00942 and 45KI00947). Site 45KI00942 (W. L. McCabe's Machine Shop Site) consists of demolition debris and historic material accumulations associated structures located on the filled tideflats (Meyer 2009). Originally part of 45KI00942, site 45KI00947 also consists of historic debris and structures (Meyer and Shong 2010). The fourth site, 45KI01188 (Historic Winn & Russell, Inc. foundations and debris), is unevaluated for listing in the NRHP. Site 45KI01188 is the nearest site to the Project area at approximately 160 feet to the east.

Abandoned wooden pilings are located adjacent to Terminal 30 (south of Base Seattle fronting Jack Perry Memorial Park). These pilings, located in the proposed Project area for Alternative 2, likely date to the historic hardening of the waterway. The Jack Perry Memorial Park pilings have not been recorded as an archaeological site to date, nor are they recorded as part of this environmental review as they are outside the location of the Preferred Alternative.

Archaeological resources are not shown on Figure 3.8-1 due to the confidentiality of their locational data (pursuant to 16 U.S.C, 470hh, 36 CFR §296.18, and RCW 42.56.300).

Historic Built-Environment Resources. Twenty-five (25) historic built-environment resources were located within the 0.25-mile radius buffer, four of which have been previously documented within the Project area (see Table L-3 in Appendix L). Of the 25 historic built-environment resources previously recorded outside the Project area but within the radius buffer, 3 are listed in the NRHP, 9 have been determined eligible for listing in the NRHP, 9 have been determined not eligible for listing in the NRHP, and 4 are unevaluated for NRHP eligibility. Of the four resources that are unevaluated for the NRHP, two are listed in the Washington Heritage Register (WHR). One listed National Register Historic District (NRHD; DT00053, Pioneer Square-Skid Road Historic District) is located inside the 0.25-mile radius buffer, though no portion of the district would overlap with the Project area. The district is located approximately 1,000 feet northwest of the northern boundary of Alternative 3 (which includes all of Terminal 46), and approximately 2,000 feet northwest of any proposed construction activities (which would occur further south within a portion of Terminal 46 located north of Base Seattle). The Pioneer Square-Skid Road Historic District covers 91.3 acres and consists of 132 contributing resources and 52 non-contributing resources (Link 2005).

Of the four previously recorded resources within the Project area, two are Coast Guard ships docked at Pier 36, which have both been previously evaluated for listing in the NRHP. Both were determined not eligible for listing in the NRHP in 2011, including Coast Guard Cutter Polar Sea, Property ID Number 333112, and U.S. Coast Guard Cutter Bayberry (WLI 65400), Property ID Number 49549, which was evaluated when it was moored at Base Seattle but has since been moved from Base Seattle. The California Ink Company (now MITAGS), located at 1726 Alaska Way South, and the Pacific Steamship Company (now Base Seattle Building 1), located at 1519 Alaska Way, both of which are located within the Project area, were both previously determined not eligible in 2008. Additional buildings, including Buildings 1, 2, 3, and 7, are over 50 years of age and have been previously determined to be not eligible for listing in the NRHP by the Coast Guard and are described in Table L-4 in Appendix L. These determinations and associated Washington SHPO concurrences; however, cannot be fully documented and/or are sufficiently out of date that they can no longer be relied upon to analyze potential project

impacts. No additional buildings have been documented within the Project area, and Base Seattle has not previously been evaluated as a potential historic district. The Coast Guard is currently undertaking a historic resources evaluation of all existing buildings and structures at Base Seattle and other structures within the footprint of the Preferred Alternative. Previously documented historic built-environment resources within the Project area are shown in Figure 3.8-1.

Documented Cultural Resources

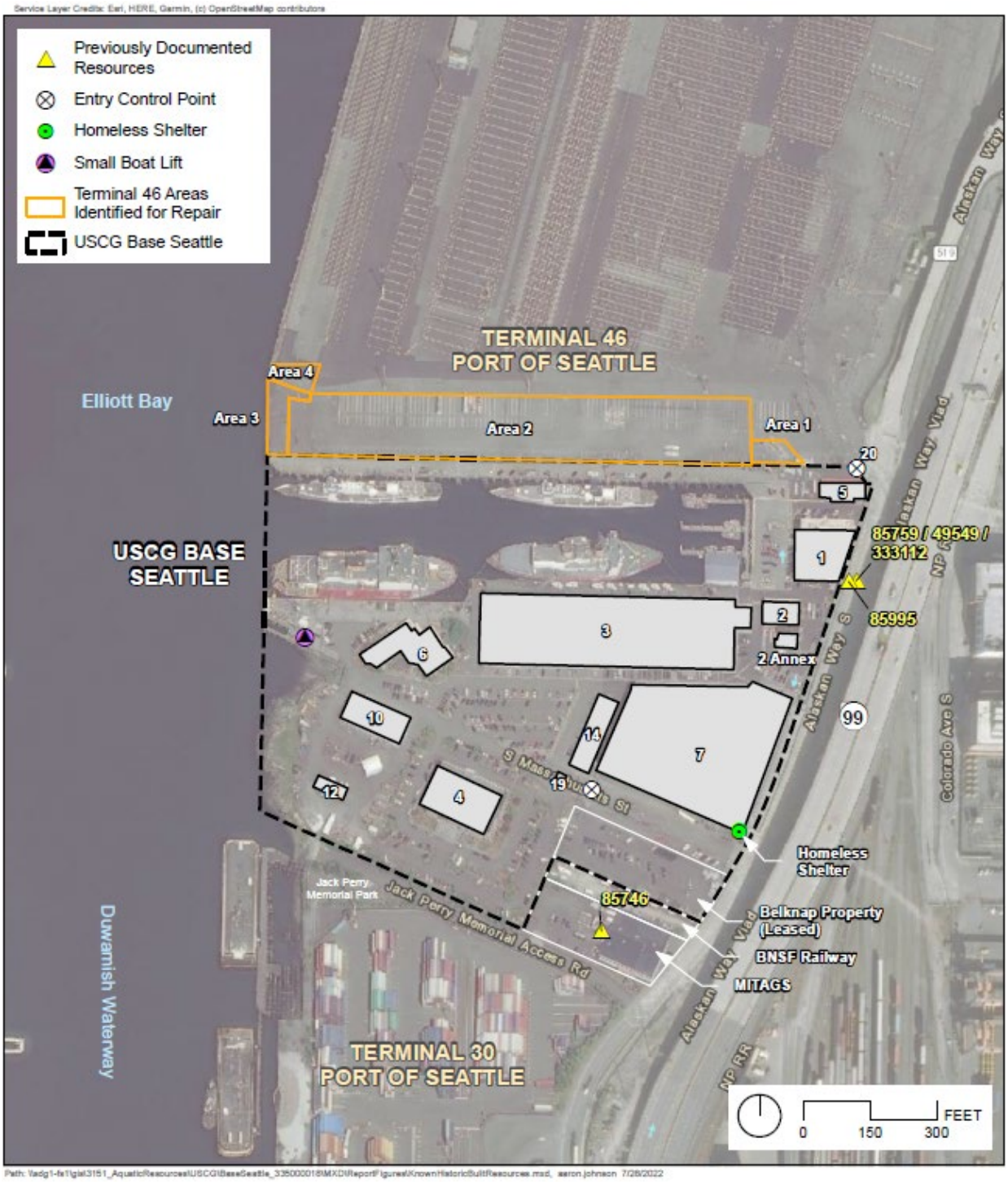
Archaeological Resources. There are no previously recorded archaeological resources within Base Seattle or any of the properties that may be acquired. Any archaeological resources in the Project area would likely be deeply buried and/or located within fill that was imported and redeposited during historical development.

Historic Built-Environment Resources. Table 3.8-1 identifies the known historic-age (over 45 years old for the purposes of NEPA analysis) built-environment resources located within the Project area that have the potential to be impacted by proposed activities, with indication of the alternatives that would impact each historic-age property. Historic-age resources, typically considered to be those resources over 50 years of age, were considered if they were at least 45 years old due to the potential length of the NEPA documentation process for the Base Seattle modernization program.

As shown in Table 3.8-1, two buildings at Base Seattle have been evaluated previously for NRHP-eligibility with DAHP concurrence (2008) that could be verified. The remaining nine known historic-age buildings and structures on Base Seattle are currently unevaluated (or require re-evaluation) for listing in the NRHP due to the passage of time or a lack of demonstrated DAHP concurrence. Additional documentation and NRHP evaluation of all historic-age built-environment resources located within the Project area is currently underway to assess potential impacts on those resources from implementation of the proposed modernization program.

At present, there are no NRHP eligible built-environment resources known to be located within Base Seattle. Previous building evaluations, including the DAHP-concurred not eligible determinations for Building 1 and the California Ink Company building (MITAGS) in 2008, indicate that resources located within Base Seattle may have integrity issues, which would eliminate them from eligibility for listing in the NRHP. The Coast Guard is currently undertaking a historic resource evaluation of all existing buildings and structures at Base Seattle as part of Alternative 1. Additional documentation is underway to evaluate or confirm the NRHP eligibility of all buildings and structures with potential to be impacted by the project.

Figure 3.8-1 Known Historic Built Resources in the Vicinity of Base Seattle



Existing Facilities

1. Base Admin
2. Exchange
3. Industrial Shops and Gym
4. CG Sector Puget Sound
5. Museum
6. UPH / Galley
7. Warehouse
10. ANT-Seattle shops
12. Magazine
14. Hazmat Pharmacy
19. Security Gate / Access Gate
20. Secondary Access Point

Known Historic Built Resources in the Vicinity of Base Seattle

FIGURE 3.8-1

Table 3.8-1 Known Historic-Age Built-Environment Resources in the Project area with the Potential to be Impacted by Proposed Activities

Building/ Structure Name[1]	Build Date; Modifications	SHPO Eligibility Determination	Location	Anticipated Eligibility / Pending Evaluation
California Ink Company (Pacific Maritime Institute)/ 1727 Alaska Way South	1950	Determined Not Eligible (2/25/2008) with DAHP concurrence *Note:* This building is not proposed to be acquired under the preferred alternative and therefore, for purposes of this analysis, is presumed to remain not eligible and unaffected. Should this building be proposed to be acquired it would be re-assessed for potential NRHP eligibility.	Adjacent to Base Seattle	Not eligible
Building 1	1926; Remodeled 1959-86	Determined Not Eligible (5/3/2008) with DAHP concurrence. Determination over 10 years old. Additional evaluation underway.	Base Seattle	Not Eligible
Building 2	1930	Determined Not Eligible by the Coast Guard in 1990; however, DAHP concurrence is not available. Additional evaluation underway.	Base Seattle	Not Eligible
Building 2-A	1930	Unevaluated – Evaluation underway	Base Seattle	Not Eligible
Building 3[2]	1923	Determined Not Eligible by the Coast Guard in 2002; however, DAHP concurrence is not available. Additional evaluation underway.	Base Seattle	Not Eligible
Building 7	1941; Remodeled 1958; Remodeled 1970s-80s	Determined Not Eligible by the Coast Guard in 2002; however, DAHP concurrence is not available. Additional evaluation underway.	Base Seattle	Not Eligible
Pier 36 – Alpha[2]	1925; Remodeled 2003	Unevaluated – Evaluation underway.	Base Seattle	Not Eligible
Pier 36 – Bravo[2]	1925	Unevaluated – Evaluation underway.	Base Seattle	Not Eligible
Pier 37[2]	1941; Remodeled 1992	Unevaluated – Evaluation underway.	Base Seattle	Not Eligible
Pilings at Jack Perry Memorial Park	Unknown	Unevaluated	Jack Perry Memorial Park	Not Eligible
Terminal 46	Circa 1940; reconstructed between 1969-80	Unevaluated – Evaluation underway.	Terminal 46	Not Eligible
Coast Guard Museum (Building 5)	Circa 1950	Unevaluated – Evaluation underway.	Base Seattle	Not Eligible

Notes:

[1] Non-historic buildings and structures (presumed non-historic based on information provided by Base Seattle and historic aerial imagery available through historicaerials.com) located within Base Seattle are not included in this table and are not currently included in the analysis for cultural resources. Those buildings and structures include Building 4 (constructed in 2006), Building 6 (constructed in 1982), Building 10 (constructed in 1991), Building 12 (constructed in 1991), Building 14 (constructed ca. 2002-06), the main access gate (replaced ca. 1995-2002), and secondary access point (replaced ca. 1995-2002).

[2] These structures are within the boundaries of the Project area but no alterations to them are part of the proposed action. Alterations to these structures may occur under the CERCLA action as discussed in Section 2 and are not assessed under this analysis.

Tribal Interests and Resources

Based on background review, there are no known TCPs within the Project area; however, Base Seattle is located near the mouth of the Duwamish River on former tidelands. Many traditional tribal place names are recorded in the vicinity of the project, three of which are near the Project area and related to the Duwamish River and Harbor Island (Waterman et al. 2001:60-66). The Duwamish watershed provided a wide range of traditional foods including salmon, clams, crabs, seaweed, wapato, tubers, and various birds and game, as well as raw materials to make clothing, structures, fishing and hunting gear, and other daily necessities.

Elliott Bay and the Duwamish Waterway are within the U&A fishing grounds of the Muckleshoot and Suquamish Indian Tribes. The Muckleshoot Tribe currently conducts seasonal, commercial, ceremonial, and subsistence net fishing within the Duwamish River and its waterways (Lower Duwamish Waterway Group 2012). The Suquamish Tribe actively manages seafood resources and fishes north (downstream) of the Spokane Street Bridge along the Duwamish waterways (Lower Duwamish Waterway Group 2012).

Treaty fishing activities in the vicinity of the Project area include salmon and steelhead net fishing, which occurs annually between mid-July and the end of November (USCG 2001). Other salmon species may include Chinook, coho, chum, and pink; both Chinook and steelhead are listed as threatened and federally protected under ESA (see Section 3.6, *Biological Resources*, for further information). Shellfish harvesting may also occur near the Project area, which is a subject being discussed during government-to-government consultation with the Muckleshoot Indian Tribe and Suquamish Tribe.

While the Project area is within U&A fishing grounds of the Muckleshoot Indian Tribe and Suquamish Tribe, Base Seattle is not currently used for tribal fishing. However, Terminal 46 is currently used by Tribal fishers where nets are attached and strung out into the water. This Terminal 46 is a key point for Tribal fishing because fish migrating upstream are funneled into the Duwamish waterway from the larger areas of Elliot Bay and the greater Puget Sound at this location. Treaty fishing is an ongoing activity, and thus, a baseline condition within the Project area.

Consultation History

The Coast Guard has invited the following federally recognized Indian tribes to participate in government-to-government consultation for the development of the PEIS (in alphabetical order): Confederated Tribes of the Yakama Nation, Muckleshoot Indian Tribe, Snoqualmie Indian Tribe, Suquamish Tribe, and Tulalip Tribes of Washington. The Coast Guard has also invited DAHP to consult. To date, only the Muckleshoot Indian Tribe and Suquamish Tribe have responded and engaged in consultation. This consultation has been undertaken pursuant to EO 13175, as well as under NEPA and Section 106 of the NHPA, as noted below. As a non-federally recognized Tribe, the Duwamish Tribe was notified through the NEPA scoping process and invited to participate as an interested party. Table L-6 in Appendix L lists the consultation to date.

The Coast Guard has initiated consultation under Section 106 of the NHPA with the development of the PEIS. Anticipated consulting parties include (in alphabetical order): City of Seattle, Confederated Tribes of the Yakama Nation, DAHP, Duwamish Tribe, Muckleshoot Indian Tribe, Snoqualmie Indian Tribe, Suquamish Tribe, and Tulalip Tribes of Washington. Additional Section 106 consulting parties may be

identified during consultation. The Coast Guard is consulting with the NHPA Section 106 consulting parties regarding the Preferred Alternative to establish the project's APE, identify historic properties, and assess potential adverse effects under Section 106 of the NHPA.

3.8.4 Environmental Consequences

The following analysis of environmental consequences is based on the understanding that the Coast Guard is currently undertaking a historic resource evaluation of all existing buildings and structures at Base Seattle (buildings and structures that would be acquired under the Preferred Alternative will also be evaluated) and that NRHP eligibility determinations for all buildings and structures located within Base Seattle will occur prior to project implementation. The Coast Guard is currently consulting under NEPA, EO 13175, and Section 106 of the NHPA to identify any potential impacts to historic properties or tribal interests and resources, and this analysis will be updated pending further consultation.

Land Acquisition

There are currently no known NRHP-listed or eligible buildings or structures with the potential to be impacted by project land acquisition activities. Changes to the Base boundary are not anticipated to have any impact on historic properties.

The Coast Guard is currently undertaking a historic resource evaluation of all existing buildings and structures at Base Seattle and any properties proposed to be acquired as part of Alternative 1. The outcome of this analysis could influence this impact finding.

There are no documented archaeological resources within the Project area. There is a potential historic archaeological site (i.e., pilings at Jack Perry Memorial Park) located in Alternative 2; if Alternative 2 is selected, then documentation of this potential resource would be required. Land acquisition would not result in impacts on any known archaeological resources.

As discussed in Section 3.6, *Biological Resources*, the acquisition of adjacent properties would have no impact on biological resources, including those salmonids protected under the ESA. Acquisition of property would not result in direct or indirect impacts to U&A fishing rights. The presence of Coast Guard cutters and the establishment or expansion of safety zones are described below under the discussion of long-term operations.

Construction

There are currently no known NRHP-listed or eligible buildings or structures with the potential to be impacted by project construction, demolition, rehabilitation, and renovation activities. Proposed construction, demolition, rehabilitation, and renovation activities would not have any impact on historic properties. The nearest NRHP-listed historic district, Pioneer Square-Skid Road Historic District, is 1,000 feet northwest of the northern most extent of action under Alternative 1 (which includes the largest acquisition area within Terminal 46) and approximately 2,000 feet northwest of all proposed construction activities (which would occur within acquired land at Terminal 46). Given the extent of separation in the industrial area, no direct or indirect visual or auditory impacts are anticipated to occur to the Pioneer Square-Skid Road Historic District or any of its contributing properties. This includes any temporary increases in construction traffic because they would be compatible with the current use of the roadway network in the vicinity.

There are no documented archaeological resources within the Project area and sediments within the Project area originally consisted of tidelands that were later overlain by historic fill and dredge spoils to create dry, developable land. No archaeological resources with intact historical integrity are expected to be present. Under all alternatives except for Alternative 2, construction, demolition, rehabilitation, and renovation will not result in impacts on any documented archaeological resources. There is a potential historic archaeological site (i.e., pilings at Jack Perry Memorial Park) located in Alternative 2; if Alternative 2 is selected, then documentation and NRHP-eligibility evaluation of this potential resource would be necessary.

In accordance with ECMs, all contractors would be required to prepare and implement an Inadvertent Discovery Plan that would establish clear directives in the event that any unanticipated discoveries of cultural resources or human remains occur during construction, demolition, or renovation (see Appendix E).

Construction activities may occur within or adjacent to U&A fishing areas, and possibly concurrent with Tribal use of these areas. As discussed in Section 3.6, *Biological Resources*, exposure to hazardous chemicals/runoff during construction and turbidity may result in fish temporarily moving away from contaminated and/or turbid areas. Underwater equipment movement, noise, and sediment vibration during construction may also result in fish temporarily moving away to avoid pile driving. As described in the Section 3.3, *Water Resources*, impacts on water quality during in-water construction would be short-term and significant. Government-to-government consultation between the Coast Guard and the Muckleshoot Indian Tribe and Suquamish Tribe is occurring at present. Consultation would be expected to be reinitiated prior to any future in-water or other construction work with a potential to affect U&A fishing rights, to eliminate conflicts between U&A fishing and the construction projects (see Section 3.8.7 and Appendix E).

Long-term Operations

Long-term operation of the expanded Base Seattle would not result in impacts on historic, built environment resources or archaeological resources. Long-term operations are not anticipated to have any adverse direct or indirect impacts.

As noted above, the Pioneer Square-Skid Road Historic District is not located within the Project area and has no potential to be directly or indirectly impacted by proposed activities. This includes any changes to roadway traffic during operations as discussed in Section 3.4, *Transportation*, because they would be compatible with the current use of the roadway network in the vicinity.

Long-term operations could impede access to U&A fishing due to mooring of Coast Guard cutters and possible establishment or expansion of safety zones around Coast Guard cutters or property. The decision to homeport other major cutters at Base Seattle is not part of this PEIS, but future mooring of major cutters is assumed in this analysis. The Coast Guard is engaged in government-to-government consultation with the Muckleshoot Indian Tribe and Suquamish Tribe to understand tribal fishing practices in the area and determine appropriate measures to eliminate conflicts between U&A fishing and Coast Guard projects and security needs (see Section 3.8.7 and Appendix E).

3.8.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

There are currently no known NRHP-eligible buildings or structures with the potential to be impacted by project activities under Alternative 1 (Figure 3.8-2), nor are there any documented NRHP-listed or

eligible or unevaluated archaeological resources with the potential to be impacted by project activities under Alternative 1. This alternative is not anticipated to have any impact on historic properties. The Coast Guard is currently undertaking a historic resource evaluation of all existing buildings and structures at Base Seattle as part of Alternative 1. The outcome of that analysis could influence this impact finding.

As discussed above, Terminal 46 is currently used by Tribal fishers to access their U&A fishing grounds and acquisition of two berths would potentially limit the ability to tie nets to Terminal 46 or place nets in the vicinity of the terminal. Temporary construction related impacts on fish and water quality would be the same as discussed above. The Coast Guard is engaged in government-to-government consultation with the Muckleshoot Indian Tribe and Suquamish Tribe to understand tribal fishing practices in the area and determine appropriate measures to eliminate conflicts between U&A fishing and Coast Guard projects and security needs.

Pursuant to NEPA, Alternative 1 is anticipated to have no significant impacts on cultural resources, including historic built-environment, and archaeological resources. An assessment of impacts to U&A tribal resources is pending continued government-to-government consultation, but the Coast Guard will strive to avoid impacts to U&A fishing areas. Pursuant to the NHPA, Alternative 1 would have no effect on historic properties.

3.8.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

There are currently no known NRHP-listed or eligible buildings or structures with the potential to be impacted by project activities under Alternative 2 (Figure 3.8-3), nor are there any documented NRHP-eligible or unevaluated archaeological resources. Alternative 2 will demolish one additional building than what is proposed for demolition under Alternative 1, but this building was previously determined not eligible for listing in the NRHP. Alternative 2 is not anticipated to have any impact on historic properties.

The Coast Guard is currently undertaking a historic resource evaluation of all existing buildings and structures at Base Seattle and the outcome of that analysis could influence this impact finding. If Alternative 2 is selected, the potential archaeological site (i.e., pilings at Jack Perry Memorial Park) would require documentation and NRHP evaluation, which could also influence this impact finding.

As discussed above, Terminal 46 is currently used by Tribal fishers to access their U&A fishing grounds and acquisition, and use of a portion of Terminal 46 could still potentially limit the ability of Tribal fishers to tie nets to or place nets in the vicinity of Terminal 46. Additional infrastructure for mooring cutters at Pier 35E/F would likely include substantial alteration of the waterway and the shoreline, expanded coverage and shading of existing open water areas, and establish new berthing in this part of the waterway, which could affect U&A rights to harvest not only fish but also other traditionally harvested species such as clams. Furthermore, the acquisition of Jack Perry Memorial Park under Alternative 2 could potentially affect tribal access to the shoreline and therefore to U&A fishing areas. The Coast Guard is engaged in government-to-government consultation with the Muckleshoot Indian Tribe and Suquamish Tribe to understand tribal fishing practices in the area and determine appropriate measures to eliminate conflicts between U&A fishing and Coast Guard projects and security needs. Temporary construction related impacts on fish and water quality would be the similar, but likely greater, than what is discussed above for Alternative 1 due to greater in-water work under Alternative 2.

Figure 3.8-2 Known Historic Built Resources in the Vicinity of Base Seattle – Alternative 1

Existing Facilities	3. Industrial Shops and Gym	6. UPH / Galley	12. Magazine
1. Base Admin	4. CG Sector Puget Sound	7. Warehouse	14.Hazmat Pharmacy
2. Exchange	5. Museum	10. ANT-Seattle shops	19. Security Gate / Access Gate

20. Secondary Access Point

Known Historic Built Resources in the Vicinity of Base Seattle - Alternative 1 FIGURE 3.8-2

The Coast Guard would work with the Port of Seattle to identify potential replacement coastal access locations for Jack Perry Memorial Park, though it would not be the Coast Guard's responsibility to replace the Park or restore public access (see Section 3.8.7).

Pursuant to NEPA, Alternative 2 is anticipated to have no significant impacts on historic built-environment and archaeological resources pending documentation and evaluation of the pilings at Jack Perry Memorial Park. An assessment of impacts to U&A tribal resources is pending continued government-to-government consultation, and while the Coast Guard would strive to avoid impacts to U&A fishing areas, Alternative 2 has the potential to significantly impact U&A fishing areas. Pursuant to Section 106 of the NHPA, Alternative 2 would have no effect on historic properties pending documentation and evaluation of the pilings.

3.8.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

There are currently no known NRHP-listed or eligible buildings or structures with the potential to be impacted by project activities under Alternative 3 (Figure 3.8-4), nor are there any documented NRHP-eligible or unevaluated archaeological resources with the potential to be impacted under Alternative 3. Alternative 3 will demolish one additional building than what is proposed for demolition under Alternative 1 (MITAGS building), but this building was previously determined not eligible for listing in the NRHP. Alternative 3 is not anticipated to have any impact on historic properties.

As discussed above, Terminal 46 is currently used by Tribal fishers to access their U&A fishing grounds and acquisition and use of a portion of Terminal 46 could still potentially limit the ability of Tribal fishers to tie nets to or place nets in the vicinity of Terminal 46. Additional infrastructure for mooring cutters at Pier 35E would involve likely include substantial alteration of the waterway and the shoreline, expanded coverage and shading of existing open water areas, and establish new berthing in this part of the waterway, which could affect U&A rights to harvest not only fish but also other traditionally harvested species such as clams. The Coast Guard is engaged in government-to-government consultation with the Muckleshoot Indian Tribe and Suquamish Tribe to understand tribal fishing practices in the area and determine appropriate measures to eliminate conflicts between U&A fishing and Coast Guard projects and security needs. Temporary construction related impacts on fish and water quality would be the similar, but likely greater, than what is discussed above for Alternative 1 due to greater in-water work under Alternative 3.

Pursuant to NEPA, Alternative 3 is anticipated to have no significant impacts on historic-built environment and archaeological resources. An assessment of impacts to U&A tribal resources is pending continued government-to-government consultation, and while the Coast Guard would strive to avoid impacts to U&A fishing areas, Alternative 3 has the potential to significantly impact U&A fishing areas. Pursuant to Section 106 of the NHPA, Alternative 3 would have no effect on historic properties.

3.8.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, there would be no changes related to land acquisition, construction, demolition, or renovation at Base Seattle and no changes to known cultural resources. Existing facilities and infrastructure would remain unimproved from current conditions. No upgrades would be implemented.

3.8.6 Comparison of Alternatives

All three action alternatives and the No-Action Alternative are anticipated to have no impacts on historic built-environment resources (see Table 3.8-2).

No impacts on documented archaeological resources are anticipated; however, there is a potential archaeological resource (i.e., the pilings at Jack Perry Memorial Park) under Alternative 2 that would require documentation, NRHP evaluation, and assessment of effects if that alternative is selected.

Short- and long-term impacts could occur to U&A fishing from acquiring property and constructing infrastructure for mooring cutters under all alternatives. All action alternatives would include in-water work associated with rehabilitation of Terminal 46 and establishment of 2 Coast Guard berths, including security zones, in the waterway. Alternative 1 would result in less impact to U&A fishing because it would not require the construction of new berths in the waterway, as compared to Alternative 2 and Alternative 3, which would require substantial modifications to the waterway and shoreline for Piers 35 E and F. Alternative 2 would also potentially cause greater impacts to U&A fishing rights if Tribal access is precluded by acquisition of Jack Perry Memorial Park.

Pursuant to NEPA, apart from impacts on U&A fishing under Alternatives 2 and 3, all action alternatives are anticipated to have no significant impacts on cultural resources, including historic built-environment and archaeological resources. An assessment of impacts to U&A tribal resources is pending continued government-to-government consultation. The No Action Alternative would result in no impacts on all cultural resources. Pursuant to Section 106 of the NHPA, all alternatives would have no effect on historic properties.

Table 3.8-2 Comparison of Alternatives for Cultural Resources

Comparison of Alternatives for Cultural Resources Impacts under NEPA	
Alternative 1	No significant impacts
Alternative 2	Potentially significant impacts on U&A fishing due to adverse impacts on access and water resources
Alternative 3	Potentially significant impacts on U&A fishing due to adverse impacts on water resources
No Action Alternative	No impacts

3.8.7 Environmental Conservation Measures

Each of the alternatives would include the implementation of ECMs (see Appendix E). Although no significant impacts on archaeological resources have been identified, some of these measures have been identified above (e.g., Inadvertent Discovery Plan) and their use would serve to avoid or further minimize any adverse construction or operational impacts. Further details regarding implementation and compliance with these measures are provided in Appendix E.

Figure 3.8-3 Known Historic Built Resources in the Vicinity of Base Seattle – Alternative 2

Existing Facilities

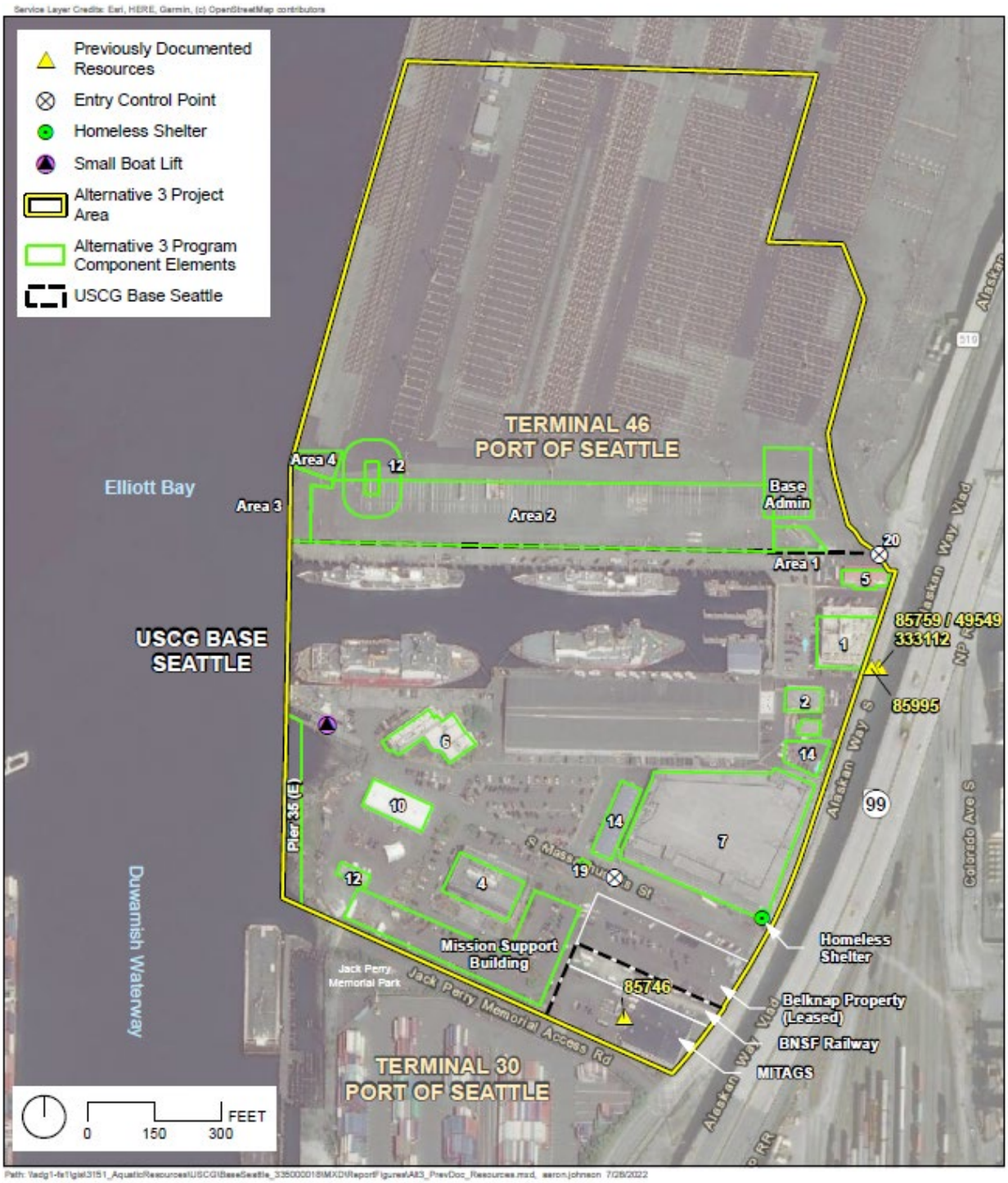
1. Base Admin	3. Industrial Shops and Gym	6. UPH / Galley	12. Magazine
2. Exchange	4. CG Sector Puget Sound	7. Warehouse	14.Hazmat Pharmacy
	5. Museum	10. ANT-Seattle shops	19. Security Gate / Access Gate

20. Secondary Access Point

Known Historic Built Resources in the Vicinity of Base Seattle - Alternative 2

FIGURE 3.8-3

Figure 3.8-4 Known Historic Built Resources in the Vicinity of Base Seattle – Alternative 3



Existing Facilities	3. Industrial Shops and Gym	6. UPH / Galley	12. Magazine
1. Base Admin	4. CG Sector Puget Sound	7. Warehouse	14.Hazmat Pharmacy
2. Exchange	5. Museum	10. ANT-Seattle shops	19. Security Gate / Access Gate

20. Secondary Access Point

Known Historic Built Resources in the Vicinity of Base Seattle - Alternative 3 FIGURE 3.8-4

Table 3.8-3 Historic-Age Built-Environment Resources with the Potential to be Impacted by Alternative

DAHP Property ID No.	Building/ Structure Name	Build Date; Modifications	Eligibility Determination	Action with Potential Impact	Anticipated Impact under NEPA	Anticipated Effect under NHPA	Alternative
85746	California Ink Company (Pacific Maritime Institute)/ 1727 Alaska Way South	1950	Determined Not Eligible (2/25/2008) *Note:* Determination over 10 years old, building being re-assessed for potential NRHP eligibility	Demolition	No Impact[1]	No Effect[2]	2, 3
85759/ 85995	Building 1	1926; 1959-86	Determined Not Eligible (5/3/2008) *Note:* Determination over 10 years old, building being re-assessed for potential NRHP eligibility	Demolition	No Impact[1]	No Effect[2]	1, 2, 3
N/A	Building 2	1930	Determined Not Eligible by the Coast Guard in 1990; however, DAHP concurrence not available	Demolition	No Impact[1]	No Effect[2]	1, 2, 3
N/A	Building 2-A	1930	Unevaluated	Demolition	No Impact[1]	No Effect[2]	1, 2, 3
N/A	Building 7	1941; 1957; 1970s-80s	Determined Not Eligible by the Coast Guard in 2002; however, DAHP concurrence not available	Rehabilitation	No Impact[1]	No Effect[2]	1, 2, 3
N/A	Pilings at Jack Perry Memorial Park	Unknown	Unevaluated	Demolition	No Impact[1]	No Effect[2]	2
N/A	T46	Circa 1940; reconstructed between 1969-80	Unevaluated	Acquisition	No Impact[1]	No Effect[2]	1, 2, 3
N/A	Coast Guard Museum	Circa 1950	Unevaluated	Demolition and rehabilitation of adjacent, associated buildings	No Impact[1]	No Effect[2]	1, 2, 3

Notes:
[1] No Impact determination subject to change depending on results of pending NRHP evaluation of all potentially affected historic-age buildings and structures.
[2] No Effect determination subject to change depending on results of pending NRHP evaluation of all potentially affected historic-age buildings and structures.

3.9 Noise

Summary of Findings

Noise impacts would occur under all Action Alternatives and the No-Action Alternative from construction activities. The noise environment following redevelopment of Base Seattle would largely be similar to the existing facility and surrounding industrial waterfront. No significant noise impacts would occur.

3.9.1 Background

Noise is defined as unwanted sound or any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying (Federal Interagency Committee on Noise [FICON] 1992). Human response to noise can vary according to the type and characteristics of the noise source, the distance between the noise source and the receptor, the sensitivity of the receptor, and the time of day.

Underwater noise in marine environments may cause harassment, injury, or even death of fish and marine mammals. Underwater noise can be generated from many sources including construction of in-water infrastructure and vessel maintenance and sustainment operations. Underwater noise is addressed in Section 3.4, *Biological Resources,* because these impacts are to fish and marine mammals.

Airborne Noise

Sound is expressed in decibels (dB), a unit of measure based on a logarithmic scale. A 10-dB increase in noise level corresponds to a 100-percent increase (or doubling) in perceived loudness. As a general rule, a 3-dB change is necessary for noise increases to be noticeable to humans (Bies and Hansen 1988).

Ambient background noise in urbanized areas is typically between 60 and 70 dBA, while ambient noise levels in suburban neighborhoods is typically between 45 and 50 dBA and in busy urban areas, including industrial areas or construction zones ambient noise may reach up to 80 dBA (USEPA 1973). Typical noise levels generated by indoor and outdoor activities, and the associated human responses, are shown in Table 3.9-1.

Noise-Sensitive Receptors

Noise-sensitive receptors are those locations where land uses are particularly susceptible to interruption by unwanted noise. These locations include residences (single and multi-family), rental housing and hotels, schools, hospitals, daycare centers, and nursing homes. Residential, institutional, cultural, and recreational land uses are generally most sensitive to ambient noise. Industrial land uses are the least sensitive to surrounding noise due to the inherently high levels of ambient noise associated with industrial activities.

3.9.2 Approach to Analysis

An increase in noise levels due to a new noise source can create an impact on the surrounding environment. This analysis considers the existing noise environment at and surrounding Base Seattle. It analyzes whether the noise environment would be altered by construction or long-term operations from the creation of new noise sources or increase the intensity of existing noise sources. Noise impacts may be beneficial if they reduce the number of sensitive receptors exposed to unacceptable noise levels.

Changes to the noise environment may be adverse if they result in increased exposure to unacceptable noise levels that exceed local standards or cause health effects.

Table 3.9-1 Typical Noise Levels and Possible Human Responses

Common Noise Source	Noise Level (dBA)	Effect
Rocket launch (no ear protection)	180	Irreversible hearing loss
Air raid siren	140	Painfully loud
Thunderclap	130	Painfully loud
Jet takeoff (200 feet), Auto horn (3 feet)	120	Maximum vocal effort
Pile driver, Rock concert	110	Extremely loud
Garbage truck, Firecrackers	100	Very loud
Heavy truck (50 feet), City traffic	90	Very annoying Hearing damage (8 hours of unprotected exposure)
Alarm clock (2 feet), Hair dryer	80	Annoying
Noise restaurant, Freeway traffic, Business office	70	Telephone use difficult
Air conditioning unit, Conversational speech	60	Intrusive
Light auto traffic (100 feet)	50	Quiet
Living room, Bedroom, Quiet office	40	Quiet
Library/soft whisper (15 feet)	30	Very quiet
Broadcasting studio	20	Very quiet
Threshold of hearing	0	Hearing begins

Source: WSDOT 2020

Sound Propagation. Sound travels through different media (i.e., air versus water) at different rates, and the intensity of sound decays over distance. Additionally, sound moving through air immediately over calm waters travels slightly further than sound traveling only over land. This results in the phenomenon where listeners on a boat can hear conversations on shore from further away than if both parties are on land and vice versa. The decay of the sound wave's energy is applied to each of the different noise-generating activities to determine the maximum distance at which noise generated during construction or operations activities would exceed noise ordinance thresholds (see Appendix N).

The City of Seattle noise ordinance establishes specific limits on the intensity and timing of noise from construction activities. While the City's noise ordinance only applies within the city limits, the federal Noise Control Act (42 USC §490 *et seq.*) requires federal agencies to "comply with local requirements respecting control and abatement of environmental noise." Therefore, the City of Seattle Noise Ordinance is used as the basis for assessing noise impacts on portions of the City beyond the Base boundaries. Appendix N provides a summary of the Seattle noise ordinance limits for operational and construction noise.

Using the maximum permissible noise levels as a baseline, the Seattle ordinance sets maximum levels and durations of daytime construction noise based on the zoning designations of the property where noise generated and the property where noise is received (Appendix N). For instance, construction noise generated on industrial zoned properties is not permitted to exceed 80 or 85 dB, depending on the type of equipment, as measured at any neighboring residentially zoned property. If the receiving property is however also industrial the noise limits are higher at 90 and 95 dB. Daytime hours are defined as 7:00 a.m. to 10:00 p.m. on weekdays, and 9:00 a.m. to 10:00 p.m. on weekends and holidays (City of Seattle 2022b). If nighttime construction were to occur, it would not be permitted to exceed the City of Seattle's maximum permissible noise levels for operational noise. These ordinance-defined levels provide a means for determining potential noise-related impacts and level of magnitude.

The construction sound limits established by the City of Seattle Noise Ordinance are measured from the property line of the location where noise generation is occurring or at a distance of 50 feet from the construction equipment whichever is greater. Because exact construction locations are not known at this time, noise generation is assessed from the property line of each of the action alternatives to determine if any neighboring noise-sensitive uses would experience exceedances of the noise limits defined by the City of Seattle. Potential short-term noise generated by construction activities is assessed from the northern boundary of each alternative because it is closest to noise-sensitive residential uses with the most stringent local noise ordinance requirements. While the exact pieces of construction equipment are not known at this time, this analysis uses a list of typical heavy construction equipment and their measured noise emission levels to estimate the noise generation during the construction. See Appendix N for the list of construction equipment and their measured noise emission levels.

The analysis uses a 500-foot radius to identify potentially affected noise-sensitive receptors, based on the loudest noise-generating activities expected to occur during modernization of Base Seattle (e.g., pile driving, sand blasting, jack hammering). The 500-foot radius is used because it is the calculated distance for noise generated by these loudest pieces of equipment to diminish to the construction noise thresholds defined by the City of Seattle Noise Ordinance (80 or 85 dB depending on equipment type; see Appendix N). The estimate of sound propagation is simplified to assume direct transit of sound waves with no intervening structures (i.e., buildings, vegetation, hills, and elevated freeways) that would intercept noise, or other noise generators that would mask noise. Because these assumptions are conservative, the analysis likely underestimates the sound reduction that would occur in the real world and overestimates the sound levels at the nearest noise-sensitive receptors.

3.9.3 Affected Environment

Base Seattle is located on Seattle's heavily industrialized waterfront and is bounded by the Duwamish Waterway (west), Port of Seattle Terminals 46 and 30 (north and south, respectively), and Alaskan Way and SR 99 (east). Base Seattle and all adjacent properties are zoned for industrial uses (IG1 U/85 zone) (City of Seattle 2020c). Harbor Island and Terminal 18, west of Base Seattle across the Duwamish Waterway, are zoned and used for industrial purposes. Coast Guard operations at Base Seattle and on the surrounding properties are largely industrial and terrestrial/marine transportation related. The BNSF railyard east of the Alaskan Way Viaduct and Port facilities to the north and south of Base Seattle are all industrial uses related to cargo transportation, handling, and storage. These facilities typically use noise-generating heavy machinery including, locomotives, trucks, yard tractors, and container-handling equipment. The industrial zoning and land uses of the areas surrounding Base Seattle are required to comply with the least stringent noise limits of the Seattle noise rule for on-site industrial uses (70 dB, see Appendix N).

Airborne Noise

The ambient airborne noise levels in the Project area are characteristic of industrial areas. This noise environment includes noise generated by operation of heavy machinery, vessel maintenance, and shoreside vehicle operations, including engine noise and safety horns within and around Base Seattle and the Port of Seattle. The Belknap, BNSF Railway, and MITAGS properties adjacent to Base Seattle are unoccupied, parking lots, or enclosed training buildings and do not contribute substantial noise to the ambient environment but are within the industrial noise environment.

No ongoing noise monitoring programs are in place at Base Seattle or the Port of Seattle to directly record noise levels at these properties. The USDOT National Transportation Noise Map (2021) reports noise levels from various modes of transportation (i.e., autos and trucks, aircraft, and trains) at between

50.0-59.9 dBA averaged over 24 hours at Base Seattle, Terminals 30 and 46, the Belknap and MITAGS properties, and BNSF Railway property. Because these data are a 24-hour average, they include quieter, nighttime noise levels and are likely to underestimate the daytime noise level at Base Seattle. Noise modeling was completed for the City of Seattle's South Lander Street Grade Separation Project, located approximately 0.75 mile south-southeast of Base Seattle and surrounded by similar industrial/ commercial uses, railyards, and busy urban streets. Noise modeling for that project estimated traffic-related noise levels up to 68 dBA with an expected noise range up to 78 dBA when other sources such as BNSF train traffic and horns immediately east of Base Seattle, heavy truck noise including on SR99, aircraft overflights, and construction activities were included (SDOT 2017). All of these existing noise sources are common to the immediate vicinity or boundary of Base Seattle.

Noise-Sensitive Receptors

Base Seattle is surrounded by industrial zoned properties. The nearest properties with residential or commercial designations are more than 500 feet northeast of the Terminal 46 Project area. These areas are zoned for mixed use with residential uses overlying ground-floor commercial uses (see Section 3.1, *Land Use and Coastal Zone Management*). Pursuant to City of Seattle noise ordinance (City of Seattle Municipal Code 25.08), the mixed-use zoning designation is considered a commercial use.

Coast Guard personnel, including ready berthing crews in Building 6 or on their vessels, and occupants of the homeless shelter in Building 7, represent the only existing noise-sensitive receptors at Base Seattle. No noise-sensitive receptors occur elsewhere within the bounds of the Project area, including on Port of Seattle Terminals 46 and 30 or the other adjacent properties.

3.9.4 Environmental Consequences of the Action Alternatives

Noise-related impacts associated with each of these action alternatives are described in detail here. Sections 3.9.4.1 through 3.9.4.3 provide a description of impacts that are unique to each action alternative.

Land Acquisition

Based on the purely transactional nature of land acquisition, this component of the proposed modernization would not have the potential to alter the existing noise environment directly or indirectly and would not impact any noise-sensitive receptors.

Construction

Noise emissions would occur as a direct result of construction, demolition, rehabilitation, and renovation activities associated with Base Seattle modernization. The impacts would be short-term as they would be limited to individual construction projects.

Construction, demolition, and renovation of individual structures under all action alternatives would generate elevated sound levels compared to the existing noise environment. Noise emissions associated with heavy construction equipment would be similar to those used in most common construction activities and is expected to be similar across all action alternatives. Average maximum airborne noise levels for common construction equipment range from 66 to 105 dB, measured at 50 feet (WSDOT 2020 reporting average maximum values are included in Appendix N). Among the noise- generating construction equipment likely to be used during construction activities, the loudest would be impact and vibratory pile driving (105 dB), jack hammering (95 dB), sand blasting (103 dB) and other pneumatic tools.

Construction noise generated by these loudest pieces of equipment would decrease with increasing distance from the Base Seattle property line. For instance, noise from impact and vibratory pile drivers would decrease from 105 dB to 85 dB over 500 feet where 85 dB is the City of Seattle Noise Ordinance limit for construction noise generated at an industrial property (i.e., Base Seattle) and received at a residential property. While it is unlikely that these loudest equipment types would be used at the Base Seattle property line, they are more likely to be used to rehabilitate the wharf area at the southern end of Terminal 46 adjacent to Slip 36. The 500-foot sound propagation radius for this equipment is used here as a conservative estimate for potential impacts on noise-sensitive receptors (i.e., residential properties). No residentially zoned properties are within 500 feet of the Base Seattle property line. Additionally, the nearest mixed-use properties that include residential uses, are further separated from the Project area by SR 99 and train corridor, which generate substantial noise and would provide some acoustic screening of these commercial/residential properties from noise-generating activities in the Project area. Therefore, it is unlikely that any residential property, or other noise-sensitive use, would experience construction noise levels in exceedance of the City of Seattle Noise Ordinance.

Noise may travel further when traveling over water, due to refraction of sound waves near the surface water, but extent of the transmission is difficult to quantify and dependent on water and atmospheric conditions. The land uses located across from Base Seattle, which could be most affected by over water transmission of noise, are industrial in nature (i.e., Harbor Island) and are not sensitive noise uses that would be adversely affected by construction noise. It is unlikely that airborne transmission of noise over water would result in exceedance of the City of Seattle noise ordinance at noise-sensitive receptors (e.g., residential components of mixed-use zoned areas).

With regard to noise-sensitive uses at Base Seattle, it is anticipated that noise-sensitive uses in Building 6 would be relocated from Base Seattle for the duration of construction activities as needed and to the extent practicable (i.e., when structures containing housing are demolished and reconstructed). The homeless shelter is only open during evening and overnight hours (6:30 p.m. to 7:30 a.m.) when construction is less likely to occur; therefore, occupants of the shelter are unlikely to experience construction-related noise. In addition to construction timing, Building 7 is constructed of reinforced concrete, which would further insulate occupants from construction-related noise.

Overall, noise impacts associated with construction, demolition, rehabilitation, and renovation activities at Base Seattle are expected to be minor because they would occur during the day in an industrial and commercial setting, and the nearest off-base sensitive noise receptors are far removed from the Base and expected construction noise sources.

Long-Term Operations

Under all action alternatives, noise generated by industrial activities, such as vessel maintenance and sustainment operations such as on- and off-loading supplies (e.g., truck and crane engine noise) and mechanical work on the vessels (e.g., power tool noise), may increase in frequency or duration due to an increase in the number of homeported vessels at Base Seattle. The activities and equipment used, and associated noise generation, would be similar to current conditions at the Base, similar to other industrial noise generated in the surrounding area, and generally restricted to immediate area. For instance, noise generated by heavy trucks or tractors (similar to cargo storage and movement activities currently ongoing at Terminal 46) to load vessels would decrease to less than the City of Seattle Noise Ordinance limit for the nearest noise-sensitive uses within 110 feet of their location.

The expansion of operations at Base Seattle and the conversion of existing Port terminal facilities to Coast Guard use would not substantially alter the existing noise environment. For example, maintenance and sustainment of Coast Guard vessels is expected to require heavy equipment to on/off-load material for the vessel and machine shops to conduct vessel maintenance. This is a similar activity but at a smaller scale of the cargo handling and vessel maintenance of commercial vessels on surrounding Port facilities. The acquired properties that do not include cargo-handling uses (i.e., Belknap, MITAGS, and BNSF Railway) would generally be replaced by mission support facilities with similar operational noise profiles similar to existing commercial development. Therefore, impacts associated with the long-term operations of modernized Base Seattle are expected to be minor.

3.9.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Short- and long-term adverse impacts related to noise emissions would be identical to those described above for common impacts, except for where construction noise would be generated and consequently where it would be audible off-site. Noise-sensitive receptors are largely limited to areas north of Base Seattle, and expansion to the north under Alternative 1 would also bring noise-generating activities nearer to the receptors. Nevertheless, short-term construction impacts are not expected to exceed City of Seattle Noise Ordinance thresholds at the nearest off-base noise-sensitive use. Long-term, operational noise levels are expected to be similar to the existing industrial noise environment and similarly would not exceed City of Seattle Noise Ordinance thresholds at the nearest noise-sensitive use. Therefore, Alternative 1 would comply with the Noise Control Act and, pursuant to NEPA, would have no significant adverse impacts associated with noise.

3.9.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

Short- and long-term adverse impacts related to noise emissions would be identical to those described above for common impacts, except for where construction noise would be generated and consequently where it would be audible off-base. Under Alternative 2, construction and long-term operations would be within the existing Base boundaries and to the south onto acquired property at Terminal 30. As such, noise-generating activities would occur farther from off-base noise-sensitive uses to the north. Consequently, the further separation of noise-sensitive uses from noise-generating activities, both during construction and long-term operations, would ensure that City of Seattle Noise Ordinance thresholds are not exceeded. Therefore, Alternative 2 would comply with the Noise Control Act and, pursuant to NEPA, would have no significant adverse impacts associated with noise.

3.9.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

Short- and long-term adverse impacts related to noise emissions would be identical to those described above for common impacts, except for where construction noise would be generated and consequently where it would be audible off-site. Under Alternative 3, construction and long-term operations would be within the existing Base boundaries, and to both the north and south onto property acquired at Terminal 46 and Terminal 30. Nevertheless, noise generated by both construction activities and long-term operations are expected to be similar to the existing industrial noise environment, and similarly would not exceed City of Seattle Noise Ordinance thresholds at the nearest noise-sensitive use. Therefore, Alternative 3 would be in compliance with the Noise Control Act and, pursuant to NEPA, would have no significant adverse impacts associated with noise.

3.9.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, there would be no changes related to land acquisition, construction, demolition, or renovation, and long-term operations at Base Seattle. Because no noise-generating construction activities necessary to implement facility modernization would occur and there would be no change to the operational activities and tempo at Base Seattle, there would be no change to the existing noise environment resulting from proposed Base improvements. Ongoing noise-generating activities at Base Seattle and the nearby ports would continue. The No-Action Alternative would have no significant impacts related to noise.

3.9.6 Comparison of Alternatives

Alternative 1 would result in the expansion of the Base nearer to noise-sensitive uses as compared to the other alternatives. Therefore, of the three action alternatives, Alternative 1 has the greatest potential to generate noise that is audible at the nearest sensitive receptors; however, noise generation under all action alternatives would not exceed the thresholds established by the City of Seattle Noise Ordinance. Construction activities would be substantially similar under all action alternatives and, despite occurring in different areas under the different alternatives, noise impacts would remain similar. In comparison, under the No-Action Alternative, no short-term construction-generated noise would occur. Under all action alternatives, long-term noise generation at Base Seattle may increase due to a greater number of cutters requiring maintenance. Noise emissions from operations and maintenance activities would be similar to existing conditions because future activities would also be substantially similar to current levels. Under the No-Action Alternative, there would be no change to existing noise levels but slightly less noise than the action alternatives due to the reduced amount of maintenance and operational support activities.

Table 3.9-2 Comparison of Alternatives for Noise Impacts

Comparison of Alternatives for Noise Impacts	
Alternative 1	No significant impacts.
Alternative 2	No significant impacts.
Alternative 3	No significant impacts.
No-Action Alternative	No impacts.

3.9.7 Environmental Conservation Measures

Each of the alternatives would include the implementation of ECMs. Although no significant impacts associated with noise generation have been identified, some of these measures have been identified above (e.g., compliance with City of Seattle Noise Ordinance) and their implementation would serve to avoid or further minimize any adverse temporary, construction-related impacts associated with noise emissions. ECMs for noise resources would apply to all of the action alternatives. Further details regarding implementation and compliance with these measures including how they would be implemented are provided in Appendix E.

3.10 Utilities and Public Services

Summary of Findings

The implementation of the Proposed Action and its Action Alternatives would result in no significant short- or long-term impacts to utilities and public services. Each of the new utilities would be designed in coordination with the individual utility providers, as necessary, to ensure that they could tie into and be accommodated by the existing utility network. Potential increases in utility demand would be minor and potential increases in public services responses would be negligible; therefore, no significant impacts would be expected on utilities and public services.

3.10.1 Background

Utilities evaluated in this section include domestic water and sanitary sewer (e.g., pipelines, pump stations, lift stations), electrical power, and natural gas. Stormwater infrastructure, including combined sewer and stormwater infrastructure, is discussed within this section; water quality issues are discussed in detail in Section 3.3, *Water Resources*. Public services evaluated in this section include fire protection, emergency services, police protection, and other public services provided to or provided by the Coast Guard and/or the Port of Seattle.

The proposed action may produce a variety of wastes, some of which could be recycled (i.e., concrete) or require disposal at landfills that accept specific materials (i.e., hazardous building materials). Refuse disposal, including disposal of construction and demolition debris, would be conducted in accordance with all federal, state, and local regulations, and at permitted landfills with availability capacity at the time. Therefore, refuse disposal is not evaluated in detail in this PEIS. Disposal of contaminated soils are addressed in Section 3.11, *Hazardous Materials and Wastes*.

The City of Seattle currently has 106 schools and 52,381 students (Seattle Public Schools 2022). The increase in student enrollment associated with the Proposed Action would be less than 1,500 students, or less than 3 percent of the total enrollment. Students would likely be distributed beyond the City of Seattle, further reducing potential concentrations of enrollment. Students would vary in age/grade such that specific grade levels or schools would not be expected to see concentrations of enrollment. Additionally, the increase in school-age children associated with the Proposed Action would occur over an extended period from 2027 to 2032 and beyond, and would depend on future decisions to homeport vessels at Base Seattle (see Figure 2.5-1 showing the project timeline in Chapter 2, *Description of Proposed Action and Alternatives*). Therefore, no specific school district, school, or grade-level is likely to be disproportionately and adversely impacted and demand on public schools is not evaluated in detail in the PEIS.

3.10.2 Approach to Analysis

This analysis considers the existing utility services and associated infrastructure within Base Seattle and the surrounding area that could be affected by the implementation of the proposed expansion and modernization of Base Seattle. This analysis relies largely on publicly available information. While public utility providers were contacted during preparation of this document regarding the potential capacity or service concerns from the proposed modernization of Base Seattle, these providers were unable to assess utility capabilities or concerns given the current lack of project details and, therefore, demand projections. For example, Seattle City Light, the electrical service provider, at present only referred the

Coast Guard publicly available Construction Services information, including details on how to apply for new or upgraded electrical service, requirements and standards, and building for energy efficiency.

The analysis of utilities and public services considered whether the Proposed Action or any of its alternatives would result in a utility demand that exceeds available supply and/or requires the substantial expansion to existing utility infrastructure. Potential impacts on utilities were also assessed with regard to anticipated disruption, deterioration, or improvement of services.

The analysis of public services considered whether the Proposed Action or any of its alternatives would result in an increase in demand for public services such that it would cause substantial delays in service ratios or response times or otherwise require the substantial expansion or construction of new facilities.

3.10.3 Affected Environment

Domestic Water

Regional domestic water services within the City of Seattle are provided by Seattle Public Utilities (SPU), a department of the City of Seattle. SPU updates its official water supply yield estimate and long-range water demand forecast when it updates its Water System Plan or when substantial new information becomes available (City of Seattle 2021d). The forecast was recently updated for the 2019 Water System Plan and found that the water demand on SPU's system is not projected to exceed the available supply until well beyond 2060.

Water is provided to Base Seattle by SPU via five ductile iron pipe connections to a cast iron water main beneath Alaskan Way (City of Seattle 2021f).[6] The water system at Base Seattle is less than 75 years old and is considered serviceable because iron pipes generally have a service life of greater than 75 years (USEPA 2002).

Water is provided to Terminal 46 via the water main line beneath Alaskan Way, with laterals serving the facilities at the existing marine cargo terminal (Port of Seattle 2020b; City of Seattle 2021). Domestic water is provided to Terminal 30 via connections to the water main on East Marginal Way South.

Sanitary Sewer and Stormwater

SPU handles the collection and discharge of wastewater and stormwater. SPU drainage infrastructure includes combined, fully separated, and partially separated sewer systems (City of Seattle 2015).[7] The City of Seattle oversees the implementation of a NPDES Stormwater Management Program (SWMP), which complies with the 2019 NPDES Phase I Municipal Stormwater Permit issued by the Department of Ecology (City of Seattle 2021e). Additionally, the City of Seattle has prepared a long-range comprehensive strategy—The Plan to Protect Seattle's Waterways—to reduce overflows and the discharge of pollutants from combined sewers and the storm drain system (City of Seattle 2015).

The buildings on Base Seattle located adjacent to Alaskan Way are serviced by individual sewer laterals that convey wastewater directly into the SPU sewer main along Alaskan Way. Base Seattle is also served by two additional sewer line systems. The northern area along Pier 37 is serviced by a sewer line that runs to a lift station, from which wastewater is pumped to the sewer main beneath Alaskan Way (Coast Guard 2005a, 2006). The second sewer line system conveys sewage from Pier 36 and most of the

[6] Ductile iron can be bent without breaking, whereas cast iron is brittle and breaks when bent.
[7] Combined sewer systems are sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe.

buildings south of Pier 36 to the sewer main beneath South Massachusetts Street. From there, the sewage is pumped to the sewer main beneath Alaskan Way. Pier 36 is equipped with lift stations that pump sewage to the South Massachusetts Street mainline. Overall, the southern sewer line system is old but serviceable, and of adequate size for existing facilities (Coast Guard 2005a, 2006).

Base Seattle is divided into eight stormwater drainage zones, based on flow direction. The majority of Base Seattle is drained by catch basins and outfalls, although some areas have openings in pier decks that discharge stormwater directly into the East Waterway of the Duwamish River. There are a total of 57 catch basins located throughout the facility discharging to a series of outfalls (Coast Guard 2014). At the north end of the Base Seattle, along Pier 37 and the pier apron, stormwater is collected in trench drains, conveyed to an oil/water separator, and then discharged into the East Waterway. Stormwater from the South Massachusetts Street area is collected in catch basins and discharged into the SPU sanitary sewer system via a vitrified clay pipeline beneath South Massachusetts Street that empties into a vitrified clay pipeline beneath Alaskan Way (City of Seattle 2021f).

Base Seattle currently meets USEPA's no exposure exclusion and therefore does not require a NPDES/MS4 permit. The Coast Guard maintains and implements a SWPPP, which minimizes the risk of pollutant discharges into stormwater from operational areas of Base Seattle through identification and implementation of control measures including BMPs, identification of a stormwater pollution prevention team, implementation of routine inspections, annual comprehensive site inspections, and recordkeeping (Coast Guard 2014).

Terminal 46 is served by a network of polyvinyl chloride sanitary sewer lines, which drain to the sanitary sewer line beneath East Marginal Way South. A regulator station sanitary sewer is located along East Marginal Way South. The regulator station for sanitary sewer discharges combined sewer overflowers (CSOs) to a 96-inch diameter reinforced concrete pipeline, which outfalls at Pier 34 into the East Waterway (Port of Seattle 2020b; City of Seattle 2021f).

The stormwater drainage network at Terminal 46 consists of a grid of stormwater inlets/grates, underground treatment vaults, and stormwater lines (City of Seattle 2021f). The site currently contains four principal stormwater outfalls that discharge stormwater from Terminal 46 (Port of Seattle 2002). The four principal outfalls discharge to Elliott Bay through the landward, under-pier bulkhead at the west perimeter of the terminal. The stormwater system was upgraded with site-specific surface water management applications as a part of the effort to consolidate the marine cargo terminal for a single tenant (Port of Seattle 2002). Additionally, small repairs to the stormwater drainage system (e.g., replacements of damaged pipeline segments) were completed in 2015 as a part of the Terminal 46 repair and maintenance activities (Port of Seattle 2015).

Ductile iron sanitary sewer lines serve the northern and central portions of Terminal 30. The southern end of the terminal is served by a cast iron sewer line. Additionally, metering and regulator stations for domestic water and sanitary sewer are located along Alaskan Way where the laterals tie into the existing main lines. The regulator station for sanitary sewer discharges CSOs to a 48-inch diameter brick outfall pipe that is owned by the City of Seattle. The King County Department of Natural Resources and Parks Wastewater Treatment Division (WTD) maintains the outfall pipe (Port of Seattle 2020b). Additionally, an 84-inch diameter, reinforced concrete outfall pipe is located along the southern boundary of the terminal (Port of Seattle 2020b; City of Seattle 2021f).

Similar to Terminal 46, Terminal 30 is also served by a subsurface storm drain system, discharging to the East Waterway via five storm drain outfalls.

The Port of Seattle operates under a Phase I NPDES General Permit for Municipal Stormwater (Phase I Permit), issued by the Department of Ecology. The Phase I Permit requires the port to develop and implement a SWMP. Most of the Port's property—including Terminal 46 and Terminal 30—is leased to commercial and industrial tenants. These properties are covered by an NPDES Industrial Stormwater General Permit, which includes additional requirements beyond those in the Phase I Permit (Port of Seattle 2021).

Electricity

Electricity in Seattle is supplied by Seattle City Light (SCL), a publicly owned utility that is part of the City of Seattle. SCL distributes electricity through an extensive network of transmission towers, substations, and distribution lines (City of Seattle 2021c). Base Seattle is served by a network of underground electrical lines that transmit power provided by SCL. There are multiple transformers and switch stations at Base Seattle. The electrical utilities connect to public infrastructure beneath Alaskan Way. There is not enough power supply at the berths to support three cutters in port.

Electrical utilities on the Terminal 46 site have been modified on numerous occasions, most recently in 2015. There is enough electricity to power two 100-foot gauge cranes, an administrative building 400 refrigerated cargo connections, security lighting, and a maintenance and repair building. There are multiple substations on Terminal 46 (Port of Seattle 2020c).

Electrical power is fed to Terminal 30 from for substations. These substations provide electrical power for the buildings, lighting, and the four cranes that previously operated at this terminal (Port of Seattle 2006).

Natural Gas

Natural gas is provided by Puget Sound Energy (PSE), a private, regulated utility (City of Seattle 2019). Base Seattle facilities are served by a series of natural gas lines that connected to gas lines along South Massachusetts Street and Alaskan Way.

Terminal 46 is served by a natural gas line is also located off the intersection of South Royal and Alaskan Way South (Port of Seattle 2020c). Terminal 30 is served by two natural gas lines are provided off East Marginal Way South with service provided to the two existing maintenance and repair buildings located on the terminal's south end (Port of Seattle 2020c).

Fire Protection and Emergency Medical Services

The Seattle Fire Department (SFD) provides fire suppression services in the City of Seattle and is the lead agency for most incidents that involve rescue operations. SFD is also the primary provider of emergency medical services (EMS) within the City of Seattle. All Seattle firefighters are certified emergency medical technicians (EMT) or paramedics. As of 2020, the latest available annual report, SFD's force consisted of 1,008 personnel and an additional 77 civilian personnel. Uniform personnel include 940 firefighter/EMTs (including 36 chiefs) and 68 firefighter/paramedics. Every day, there are a minimum of 216 members responding to emergencies across the City (City of Seattle 2020).

SFD provides fire suppression services at Base Seattle and the Port. The SFD (Station No. 14) is located approximately 1.4 miles from Base Seattle, which is an approximately 10-minute drive under normal traffic conditions. The fire water system supporting firefighting at Base Seattle and the Port is largely integrated with the domestic water system. Base Seattle is served by several fire hydrants along South Massachusetts Street and Alaskan Way (City of Seattle 2021f). Additionally, as described in the

Northwest Area Contingency Plan (2020), SFD operates five fireboats, which can be augmented by ships and small craft with fire suppression capabilities from the Coast Guard.

SFD also provides EMS services at Base Seattle and the Port. Medical services provided at Base Seattle include the existing Medical/Dental Clinic in Building 7, which maintains patient wellness through provision of health and dental care, physical exams, Occupational Medical Surveillance and Evaluation Programs, optometry, and pharmacy services. The medical clinic at Base Seattle (located in Building 7) addresses minor medical issues. As described above, SFD provides EMS responses, including basic life support (BLS) and advanced life support (ALS) responses.

Police Protection Services

The Seattle Police Department (SPD) is the primary law enforcement agency in the City of Seattle. As of 2021, SPD's force consisted of 1,200 sworn officers and 613 civilian employees (City of Seattle 2022).

Law enforcement activities on Base Seattle are handled by the contract security team that manages the ECP and patrols the perimeter. Base Seattle is surrounded by an 8-foot-tall security fence and entry to Base Seattle is restricted at the existing ECP along South Massachusetts Street.

The Port of Seattle also has its own police department that is the primary law enforcement service for the SeaTac International Airport and Port facilities. This department currently consists of over 115 commissioned police officers and 40 non-commissioned personnel. The Port police are the primary first responders for all reported crimes and incidents within its jurisdiction (Port of Seattle 2022). Headquarters and dispatch for the Port police are located at the Seattle-Tacoma International Airport, and operations are conducted out of the Port's police sub-station at Terminal 30 at 2431 East Marginal Way South (Port of Seattle 2006).

Other Public Services

Coast Guard operations and facilities at Base Seattle provide a variety of other important public services. Some of the more visible responsibilities of Base personnel that serve the public interest include maintaining aids to navigation, enforcing maritime law, conducting search and rescue, supporting climate change research aboard Polar icebreakers).

3.10.4 Environmental Consequences of Action Alternatives

Land Acquisition

Acquisition of property under any of the alternatives would result in a decoupling of utility infrastructure. Following the proposed land acquisition, the Coast Guard would be responsible for operating and maintaining utility infrastructure within the new Base boundaries, entirely separate from the adjacent utility infrastructure serving the Port. For example, the proposed stormwater system on Base Seattle would be completely separate from the stormwater system serving the remaining Port property (refer to Section 3.3, *Water Resources*). With respect to utility usage, the proposed land acquisition would displace some existing Port operations and any utility demand associated with these functions would either be reduced or would relocated with the functions. Overall Port demand would be expected remain largely similar to existing conditions at the Port.

Construction

The utility systems on Base Seattle—including domestic water, stormwater, sanitary sewer, electrical, and natural gas—while largely serviceable at present, exceed their individual service lives and require

continuous repair and maintenance to keep them operational. Additionally, the existing utility systems do not have adequate resiliency for potential to account for sea level rise and/or reasonably foreseeable natural disasters (e.g., earthquakes, tsunamis – see Section 3.2, *Geological Resources*). Further, many of the existing utility systems or components at Base Seattle do not have the capacity to serve the modern Coast Guard cutters or the proposed increased number of cutters at Base Seattle (refer to Chapter 2, *Description of Proposed Action and Alternatives*). Under the Proposed Action, all existing utilities on Base would be replaced and realigned to address resiliency and capacity shortcomings and to account for new or relocated facilities. Replacement and upgrade of utility systems would require excavation of existing and new utility corridors, replacement of utility lines, installation of lift and pump stations, and extension of existing utilities to relocated infrastructure and/or piers. It is estimated that these improvements would involve approximately 7,000 linear feet of stormwater infrastructure alignment and approximately 3,500 linear feet of water, sanitary sewer, electrical power, and natural gas combined alignment. Installation of pier-side power mounds and utility vaults would address the utility capacity issues when three or more cutters are in port.

Details on the design, construction activities, and construction timing are not currently available. The design of the proposed utilities improvements would be coordinated with the appropriate utility providers, as necessary, to ensure that they could tie into and be accommodated by the existing utility network. It is anticipated that there would be frequent, short-term, temporary interruptions in utilities (e.g., temporary power outages, temporary shut-off of potable water lines). The schedule for these utility outages, while currently unknown, would be coordinated with the utility provider, as necessary (see Appendix E). Additionally, the schedule for utility outages would be communicated throughout Base Seattle and with the Port of Seattle.

Construction activities related to public services—specifically police protection services—would include security fencing and improvements to the main entrance gate (e.g., security barriers, a gatehouse, and overhead security lighting would be replaced). Construction activities would be communicated across Base Seattle and coordinated with the Port of Seattle as well as the City of Seattle, such that there would be no interruption of emergency access to Base Seattle or surrounding Port of Seattle properties.

Long-term Operations

As described previously, the replacement of existing utility systems is required to address aging, non-resilient infrastructure, reduce maintenance requirements, and provide for existing and long-term utility demands. Utilities infrastructure designs (e.g., layouts, capacities) have not yet been developed. As the design process advances, the Coast Guard would coordinate with individual utilities providers (see Appendix E), as necessary, to ensure that proposed utility infrastructure on Base Seattle is compatible with the existing off-site infrastructure and the projected regional utility capacity.

While the implementation of the Proposed Action would result in additional building square footage to support increased personnel, replacement or rehabilitation of old, inefficient systems and buildings with new, energy efficient buildings that incorporate sustainability features, in accordance with Coast Guard policy (Coast Guard 2014) and Coast Guard guidance (Coast Guard 2020), is anticipated to result in increased energy efficiency and reduced per capita utility consumption. The Coast Guard construction projects would be conducted in accordance with the Guiding Principles for Sustainable Federal Buildings and Associated Instructions (CEQ 2020) or applicable guidance at the time of construction. The Guiding Principles provide agencies with a means to meet statutory provisions relating to high-performance sustainable buildings. The Guiding Principles ensure federal buildings:

- Employ integrated design principles,
- Optimize energy performance,
- Protect and conserve water,
- Enhance the indoor environment,
- Reduce the environmental impact of materials,
- Assess and consider building resilience.

In addition, in accordance with EO 14057, and the accompanying Federal Sustainability Plan, the Coast Guard would target the following objectives in the redevelopment of Base Seattle:

- Net-zero emissions operations by 2050 (65% GHG reduction from 2008 levels by 2030)
- 100% CFE by 2030 (50% on a 24/7 basis),
- Net-zero emissions buildings by 2045 (50% reduction by 2032),
- 100% net-zero emission vehicle acquisition by 2035 (100% light-duty acquisitions by 2027),
- Net-zero emissions procurement by 2050,
- Climate resilient infrastructure and operations,
- Climate and sustainability-focused workforce.

All actions pursuant to the objectives of the Guiding Principles must be consistent with applicable laws and regulations and are subject to the availability of appropriations or other authorized funding.

While not yet designed, each utility system upgrade would be planned to ensure that it could adequately support the demand from all current and future vessels, as well as associated personnel (up to 1,900 personnel by FY 2032). Decisions regarding future homeporting of major cutters have not been made at this time.

Given that Base Seattle is a secured, contained facility, the proposed Base Seattle modernization would not measurably affect the service ratios or response times for fire protection, EMS, or police protection services. The impact on service ratios (e.g., persons per firefighter, persons per EMT) would be negligible for the service providers. As previously described, on-Base security infrastructure (e.g., ECP, perimeter fencing) as well as contract security personnel, minimize the need for public service responses. Under the Proposed Action, new security fencing would be installed around Base Seattle, including any acquired properties. Additionally, the main entrance gate would be upgraded to improve security (i.e., security barriers would be installed, overhead security lighting would be replaced, the Main Gate Security Gatehouse would be replaced, and security sensors would be installed). This improved infrastructure would further limit the potential need for public service response.

3.10.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Short-term and long-term adverse impacts on utilities and public services would be similar to those described for all of the action alternatives above. Following the proposed land acquisition, utilities within the new boundaries of Base Seattle would be decoupled from the Port's utility infrastructure. The Coast Guard would be responsible for operating and maintaining utility infrastructure within the new Base boundaries, completely separate from the adjacent utility infrastructure serving the Port. The displaced functions under Alternative 1 would either be eliminated or relocated elsewhere within the Port of Seattle. If these functions were to be eliminated, the implementation of Alternative 1 would result in reduced utility usage by the Port. If the functions were relocated, utility lines could be replaced

and rerouted to serve the new structures, if necessary. Regardless of elimination or relocation of displaced functions, improvements to utility lines would not create a demand that exceeds available supply or requires substantial expansion to existing utility infrastructure. Further, proposed improvements would not increase demand for public services such that it would cause substantial delays in service ratios or response times or otherwise require the substantial expansion or construction of new facilities.

Removal and replacement of existing utilities at each of the acquired properties (Terminal 46, Belknap, MITAGS, and BNSF Railway) would be required. While the design of the proposed utility infrastructure would require further refinement, it is anticipated that the routes and the lengths of the proposed utility extensions would be similar to those described for all of the action alternatives above. Nevertheless, each of the new utilities would be designed in coordination with the individual utility providers, as necessary. As such, Alternative 1 would not create demand that exceeds available supply or requires substantial expansion to existing utility infrastructure. Additionally, Alternative 1 would not create an increase in demand for public services such that it would cause substantial delays in service ratios or response times or otherwise require the substantial expansion or construction of new facilities. Therefore, pursuant to NEPA, Alternative 1 would have no significant impact on utilities and public services.

3.10.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

Short-term and long-term adverse impacts on utilities and public services under Alternative 2 would be similar to those described for Alternative 1. The implementation of Alternative 2 would not result in a utility demand that exceeds available supply. Further, the implementation of Alternative 2 would not result in a demand for public services that would cause substantial delays in serve ratios or response times.

3.10.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

Short-term and long-term adverse impacts on utilities and public services under Alternative 3 would be similar to those described for Alternatives 1 and2. The implementation of Alternative 3 would not result in a utility demand that exceeds available supply. Further, the implementation of Alternative 3 would not result in a demand for public services that would cause substantial delays in serve ratios or response times.

3.10.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, there would be no changes related to land acquisition, construction, demolition, renovation, or long-term operations at Base Seattle. There would be no changes in existing utility infrastructure or public services at the Port of Seattle related to the displacement of functions on Terminal 46, Terminal 30, or any of the other proposed acquired properties. No temporary construction-related disturbance of utility services would occur with the absence of the Base Seattle modernization. Existing facilities and infrastructure would continue to consume electricity and natural gas. Use of these utilities would remain unimproved from current conditions. No upgrades to enable energy efficiency, reduced emissions, and other benefits would be implemented. The operation of the existing aging utilities infrastructure would continue to require daily repair and maintenance. The No-Action Alternative would not address the lack of resiliency related to sea level rise or natural disasters (e.g., earthquakes, tsunamis) and any such event could result in catastrophic, long-term utilities outages (e.g., power outages, sewer back-up) and associated long-term disruptions of operations at Base Seattle. Prolonged interruption of utility services at Base Seattle could substantially impair the ability of the

Coast Guard to accomplish its mission at the Base, which can be especially critical during natural disasters or other major events. Future mission execution would likely not be as efficient due to the cost of infrastructure maintenance issues and the limited capacity necessary to future/evolving operations. There would however be no significant impact to utilities and public services.

3.10.6 Comparison of Alternatives

Because Alternative 1 only involves the acquisition of property on Terminal 46, rather than properties on Terminal 46 and Terminal 30, Alternative 1 would allow for the most efficient utility infrastructure improvements. Nevertheless, the extent of removing and replacing existing utility lines under all of the action alternatives, would require similar levels of construction, because Base Seattle, Terminal 46, and Terminal 30 already receive domestic water, sanitary sewer, electrical power, and natural gas through existing infrastructure, and have storm drain systems. Therefore, pursuant to NEPA, the alternatives, including the No-Action Alternative, would have no significant impact on utilities and public services.

Table 3.10-1 Comparison of Alternatives for Public Services and Utilities

Comparison of Alternatives for Public Services and Utilities Impacts	
Alternative 1	No significant impacts.
Alternative 2	No significant impacts.
Alternative 3	No significant impacts.
No-Action Alternative	No significant impacts.

3.10.7 Environmental Conservation Measures

Each of the alternatives would include the implementation of ECMs, environmental commitments, and special procedures. Although no significant impacts to utilities and public services have been identified, some of these measures (e.g., coordination with utility providers, as necessary, during design and construction activities), and their implementation would serve to avoid or further minimize any adverse temporary or operational impacts. The range of ECMs would be the same for all three action alternatives. For further details regarding these measures including how they would be implemented see Appendix E.

3.11 Hazardous Materials and Wastes

Summary of Findings

The Proposed Action and its Action Alternatives would increase the use, storage, and disposal of minor amounts of hazardous materials at Base Seattle. All of the Action Alternatives would result in the disturbance of hazardous building materials as well as the disturbance of contaminated soils and/or groundwater. There would be short-term, potentially significant impacts due to the in-water work associated with Terminal 46 and Terminal 30.

3.11.1 Background

Hazardous materials are defined as products and substances that serve a purpose (e.g., gasoline for fueling), but may pose a serious illness or cause an impact to environment if stored improperly. Hazardous wastes are defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes (i.e., used products and substances) which pose a substantial present or potential hazard to human health or the environment (USEPA 2022).

Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These wastes are called universal wastes and their associated regulatory requirements are specified in 40 CFR Part 273.

National Priority List (NPL) Sites (Superfund Sites)

Cleanup sites listed on the NPL are often known as Superfund sites. NPL sites are cleaned up by the USEPA under CERCLA. These locations have been determined to be sites that are complex and represent an unacceptable risk to the public. The NPL guides USEPA in determining which sites warrant further investigation for remediation (USEPA 2021e). The Superfund Cleanup Process involves:

- Preliminary assessment/site inspection
- NPL Site Listing Process
- Remedial investigation/feasibility study
- Records of decision
- Remedial design/remedial action
- Construction completion
- Post construction completion
- NPL deletion
- Site reuse/redevelopment

Non-NPL Cleanup Actions

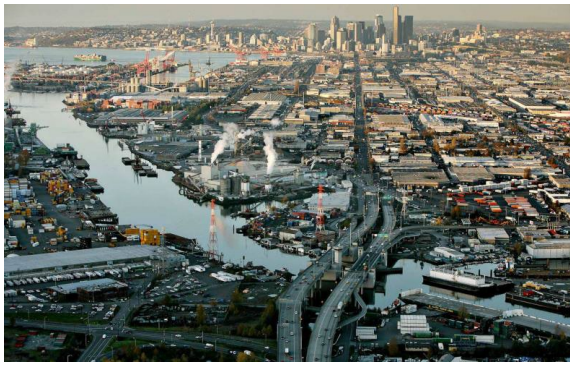
Sites that are not listed on the NPL may still require cleanup actions. Coast Guard sites that are contaminated with CERLCA hazardous substances are cleaned up under CERCLA with the Coast Guard as the lead agency, with input from the state and other federal agencies. Non-CERCLA hazardous substances are cleaned up under state programs or RCRA. Non-federal entities typically cleanup up sites under state authority and oversite.

3.11.2 Approach to Analysis

This analysis considers the use, storage, and disposal of hazardous materials and wastes at Base Seattle, on properties proposed for acquisition, and on other neighboring parcels that could affect or be affected

by the proposed Base Seattle modernization. The analysis considers existing Superfund sites and other contaminated sites on and around Base Seattle (see Figure 3.11-1).

Several federal, state, and local laws regulate the storage, handling, disposal, and transportation of hazardous materials and wastes. The purpose of these laws is to protect public health and safety along with the physical environment. Appendix F provides a comprehensive summary of regulations, guidance, and approved management plans for which each of the alternatives has been evaluated against with respect to compliance.



Past industrial uses have resulted in contaminated sites along the Duwamish River, including the HISS and the Lower Duwamish Waterway Superfund Site.

The PEIS considers whether the use, storage, or disposal of hazardous substances would substantially increase the human health risk or environmental exposure. The PEIS also considers whether the proposed expansion and modernization of Base Seattle would disturb or create additional contamination, resulting in adverse effects to human health or the environment.

3.11.3 Affected Environment

Regional Setting

Since the early-1800s industrial development and industrial uses along the Duwamish Waterway have relied upon hazardous materials and generated hazardous wastes. The presence and release of these materials has resulted in contamination of soil, sediment, and groundwater. Several sites with historic contamination have been designation as NPL sites (Superfund sites) managed by the USEPA, non-NPL cleanup actions managed by federal agencies, or cleanup sites managed by the Department of Ecology.

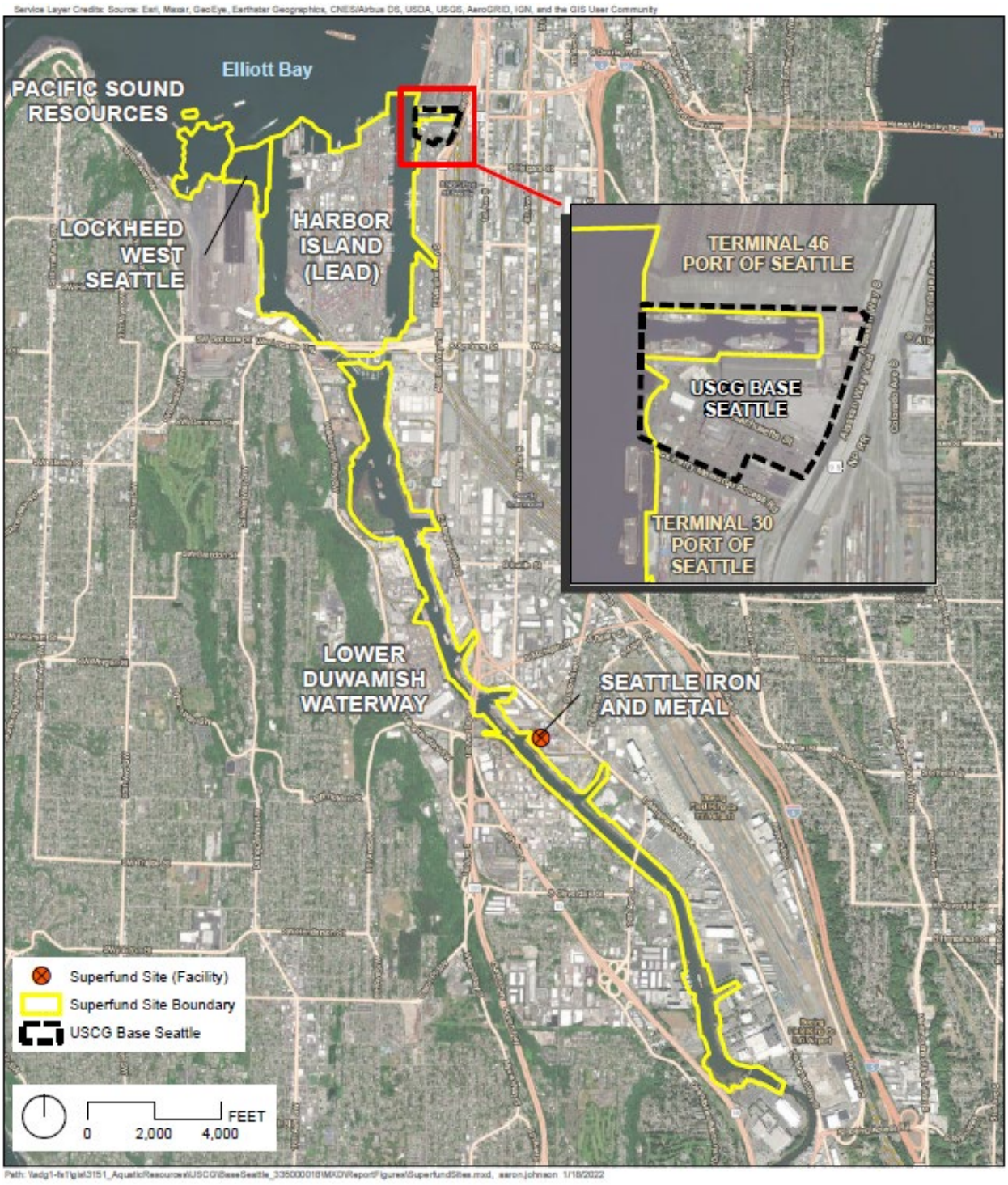
Superfund Sites

There are four Superfund sites in the vicinity of Base Seattle: Harbor Island (HISS); Lockheed West Seattle; Pacific Sound Resource; and Lower Duwamish Waterway (see Figure 3.11-2). These superfund sites are associated with both historic and modern industrial development of the waterfront surrounding Base Seattle. The HISS includes submerged lands within portions of Base Seattle, Terminal 46, and Terminal 30, and is described in greater detail below. The other three sites do not overlap Base Seattle or the Project area (see Figure 3.11-1).

Harbor Island Superfund Site

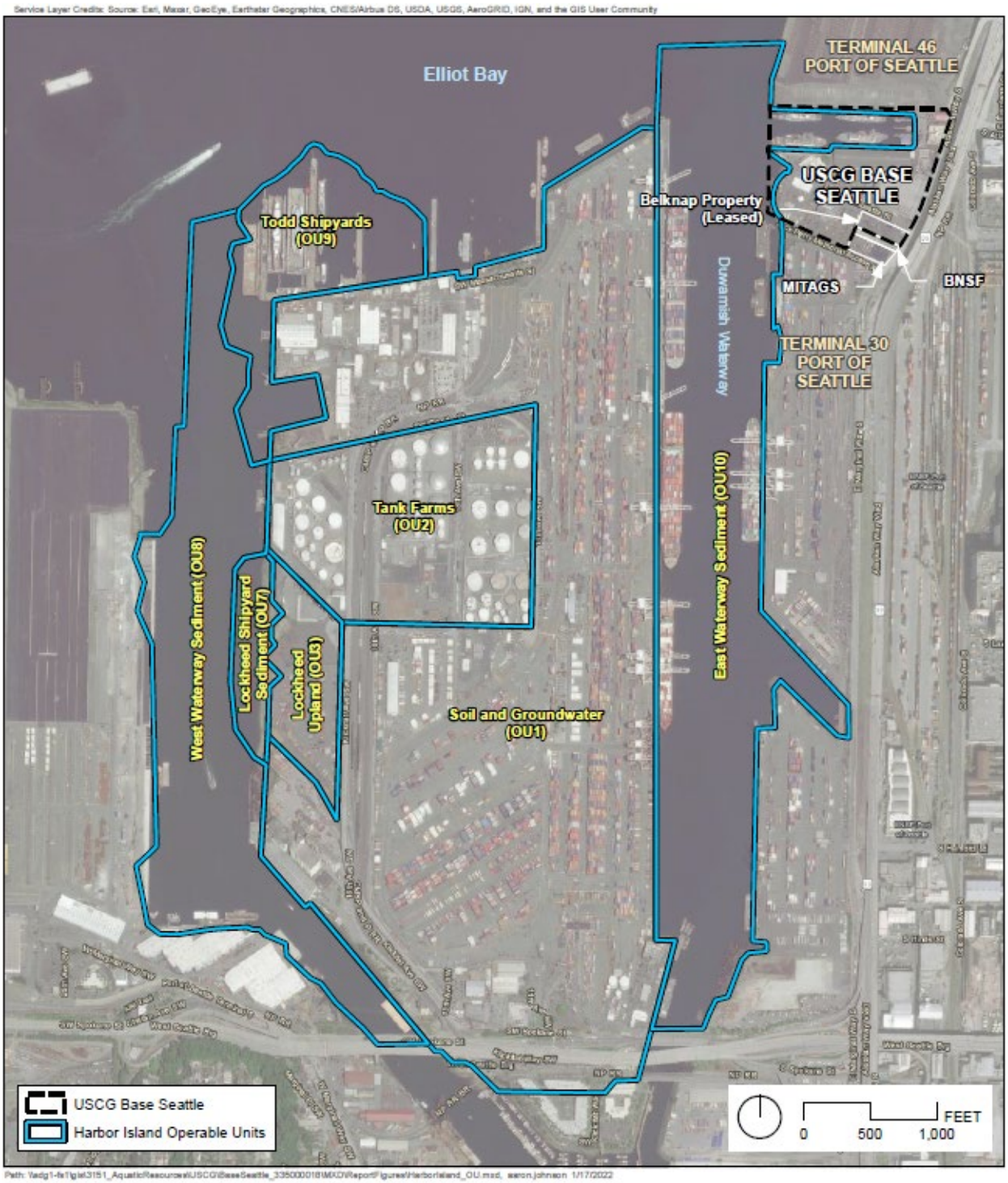
Harbor Island is a 420-acre, man-made island located in the Duwamish River delta in Elliott Bay. It was constructed with the addition of bulkheads and fill in the early 1900s (see Figure 3.11-2). The island was historically used for commercial and industrial activities including ocean and rail transport operations, bulk fuel storage and transfer, secondary lead smelting, lead fabrication, shipbuilding, and metal plating. Warehouses, laboratories, and offices also existed on the island (USEPA 2020a).

Figure 3.11-1 Superfund Sites at the Port of Seattle



PEIS	Superfund Sites at the Port of Seattle	FIGURE 3.11-1

Figure 3.11-2 Harbor Island Operable Units



PEIS	Harbor Island Operable Units	FIGURE 3.11-2

Harbor Island was listed on the NPL as HISS on September 8, 1983, based on studies that found elevated concentrations of lead in soil associated with former lead smelter operations. The site also has been found to have elevated concentrations of other inorganic and organic substances. General sources of potential contamination were identified as direct discharge of waste, spills, historical disposal practices, atmospheric deposition, groundwater seepage, storm drains, CSO systems, and other nonpoint discharges. Sediment contamination of the estuarine environment surrounding Harbor Island may also have resulted from upstream sources (USEPA 2020a).

Because of its large size, the HISS is broken down into OUs to make cleanup more manageable and efficient. The East Waterway OU encompasses the eastern side of Harbor Island and includes submerged lands adjacent to Base Seattle, Terminal 46, and Terminal 30, as depicted in Figure 3.11-2. This is the only remaining OU that requires active remediation activities. The primary contaminants of concern in East Waterway sediments include polychlorinated biphenyls (PCBs), arsenic, mercury, dioxins/furans, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) (Port of Seattle 2019).

As described in Section 1.2.2, *Comprehensive Environmental Response, Compensation, and Liabilities Act Action at Base Seattle*, the Coast Guard is conducting an NTCRA in Slip 36 under an ASAOC with USEPA. The Coast Guard and USEPA have been evaluating contamination within Slip 36 since 1984 and, based on an investigation conducted in 2019 as part of a CWA Section 404 permit, determined an EE/CA might be appropriate. USEPA evaluated this information and concurred through an EE/CA Action Memorandum. The EE/CA will evaluate removal alternatives that advance the cleanup of the East Waterway OU. USEPA has previously directed a PRP coalition to conduct an RI/FS, which evaluated a full suite of remedial alternatives. The Coast Guard will use these alternatives, and potentially others, to evaluate removal actions that may be appropriate to address contamination at the site. Should USEPA select a removal alternative(s) other than "No Action," the Coast Guard will implement the action(s).

Actions considered should address contaminate mass or otherwise support the removal of the contamination while allowing the Coast Guard to continue to execute its federally mandated missions.

Other Active Cleanup Sites within Base Seattle (Listed by the Department of Ecology)

The Department of Ecology has identified the following other cleanup sites within the existing boundaries of Base Seattle (see Figure 3.11-3).

Emerald City Disposal Site

The area of Base Seattle where Building 4, Building 10, and Building 12 are currently located (see Figure 3.11-3) has been listed on the Department of Ecology's Cleanup Site List. The Seattle Disposal Company (Emerald City Disposal and/or Rabanco) operated this area as a commercial refuse transfer station from 1965 to 1990, until acquisition by the Coast Guard in 1990 (Coast Guard 2006). Gasoline contaminants were discovered above cleanup levels in the soil, and halogenated organics were discovered above cleanup levels in the surface water. The Coast Guard has listed this site as an environmental liability and will prioritize cleanup through its Environmental Compliance and Restoration (EC&R) Program.

U.S. General Service Administration Federal Warehouse

The U.S. General Service Administration Federal Warehouse is another Department of Ecology Cleanup Site located on Base Seattle between Building 7 and the Building 2 Annex (see Figure 3.11-3). This site included three leaking storage tanks (a gasoline UST and two heating oil tanks) and their associated piping, which were removed in 1997. During tank decommissioning, diesel contaminants were detected in soil samples and groundwater samples (Herrera Environmental Consultants 1998, 2000a). The U.S.

General Services Administration has demonstrated that the area beneath the former tanks has been cleaned up to the maximum extent practicable, as defined in the Model Toxics Control Act cleanup regulations, Washington Administrative Code (WAC) 173-340-360(5)(d). Based on the results of the investigations, no further assessment is necessary for the U.S. General Service Administration Warehouse. Utility and construction workers should be informed of the potential presence of residual diesel contamination and to wear protective clothing when disturbing soils across these areas where contaminated soils may exist (Herrera Environmental Consultants 2000b).

Other Active Cleanup Sites within the Port of Seattle (Listed by the Department of Ecology)

A number of other cleanup sites listed by the Department of Ecology are located within the Port of Seattle and in proximity to Base Seattle (see Figure 3.11-3).

Terminal 46

Terminal 46 has been listed on the Department of Ecology's Cleanup Site List for gasoline and diesel contaminates due to two leaking USTs. Soil samples collected in 1990 determined that potential leakage of petroleum hydrocarbons has been minimal (Kennedy/Jenks/Chilton 1990). The USTs were removed in September 1991 and which time 200 cubic yards of soil was removed and backfilled with clean pea gravel. Additional excavation was limited due to the presence of the City of Seattle's main sewer line and to maintain pier access (B&C Equipment Co. 1991). Additional sampling in 1992 did not indicate the presence of petroleum hydrocarbon compounds above Washington Method A cleanup levels. No further action was recommended until adjacent structures are removed, at which time the remaining petroleum hydrocarbons could be removed (Applied Geotechnology 1992).

Former GATX Facility

The property south of Base Seattle was developed between 1916 and 1920 by the Associated Oil Company as a bulk fuel terminal, also known as the GATX Terminal. Several large ASTs were located on this property, along with a service station on the eastern end of the property. The service station was removed before 1956, but the bulk fuel facility operated until at least 1990. Previous investigations have confirmed the presence of the petroleum hydrocarbons in soil and groundwater at the GATX site (Parametrix, Inc. and Enviros, Inc. 1994). Releases to soil and groundwater of petroleum hydrocarbons, PAHs, and metals were confirmed in 1998 (Pacific Groundwater Group 2013).

Approximately 32,000 cubic yards of contaminated soil was excavated from the GATX site from 1994 through 1996. From 1996 through 1998, an Air Sparge treatment system was operated at the site. Groundwater monitoring activities were completed from 1996 through at least 1998. The system was shut down in December 1998, once the system had operated for the minimum required time period of 2 years and no trigger levels were exceeded. Monitoring data indicate that trigger levels provided in the Groundwater Compliance Monitoring Plan have been satisfied for all 5 years since the Air Sparge system was shut down. Based on this information, Kinder Morgan believes that no further monitoring is required at the site (The RETEC Group, Inc. 2004).

Terminal 30

The northern portion of Terminal 30 operated as a bulk fuel terminal as early as 1905 and included ASTs and associated piping and equipment. This property also supported a service station sometime between 1920 and 1936 (Harding Lawson Associates 1995). Fuels stored on the site during that time included furnace oil, stove oil, bunker fuel oil, diesel fuel, aviation fuel, Stoddard solvent, thinner, pearl oil, and gasoline (GeoEngineers 1998; Pacific Groundwater Group 2016; Crete Consulting, Inc. 2018).

The Terminal 30 site encompasses approximately 7 acres where petroleum contamination is present and includes light non-aqueous phase liquid (LNAPL), soil, and groundwater contamination. The extent of contamination has been significantly reduced since the terminal operations ceased in 1984 due to remedial action and natural degradation processes. The extent of soil contamination is similar to the maximum historical extent of LNAPL with exceedances of cleanup levels for gasoline, diesel, and other petroleum hydrocarbons, and toluene. Groundwater at the Terminal 30 site has exceedances of cleanup levels for benzene, PAHs, and gasoline, diesel, and other petroleum hydrocarbons. The thickness of LNAPL accumulated at the water table has been measured in Terminal 30 site monitoring and recovery wells from 1984 through 2011 at varying frequencies. LNAPL thickness has decreased significantly at all wells that have had measurable product (Pacific Groundwater Group 2016; Crete Consulting, Inc. 2018).

In 2017, the Department of Ecology issued a consent decree for remediation. Installation of an Air Sparge/Soil Vapor Extraction system was completed in 2019 to accomplish the required remediation. The latest quarterly monitoring report (October 1 through December 31, 2021) indicates that the system continues to operate and remove contaminates as described in the Cleanup Action Plan (CAP) (Port of Seattle 2022).

Other Areas of Potential Contamination (Not Listed by the Department of Ecology)

The following properties, which are proposed for acquisition by the Coast Guard, are not listed by the Department of Ecology, but may have a potential for contamination based on previously land uses.

Belknap Property (Leased by the Coast Guard)

As described in Section 1.1.1, *Base Seattle*, the Coast Guard currently leases the Belknap property from the Port of Seattle to help meet existing flexible storage space and parking shortfalls. The Coast Guard prepared Phase I and Phase II Environmental Due Diligence Audits (EDDAs) in 2007 and 2010 respectively, which assessed the potential for existing contamination at the Belknap property. The Phase I EDDA identified two hydraulic elevators, a boiler room, and a sump that were formerly located on the Belknap property associated with former uses on the site. Subsequent soil sampling conducted under the Phase II EDDA determined that shallow soil (less than 4 feet bgs) and groundwater in the area of the former sump on the Belknap property contains petroleum hydrocarbons, cPAHs, and chromium (soil only). The Belknap Property is not identified as an active cleanup site by Ecology.

BNSF Railway Property

The Phase I EDDA (2007) prepared for the Coast Guard describes that approximately 50 to 200 pounds of waste solvents and dyes were reportedly dumped on the BNSF Railway property between 1984 to 1987. Ecology reportedly investigated and observed several areas of staining in the BNSF Railway property during a 1987 inspection. Subsequent soil sampling conducted under the Phase II EDDA identified petroleum hydrocarbons, cPAHs, and trichloroethene (TCE), and chromium (soil only). Site data indicate the area of impacted soil is generally limited to the historical dumping area on the BNSF Railway property adjacent to the former Flint Ink product transfer area. TCE is also present in groundwater beneath the western portion of the BNSF Railway property, downgradient of the historical dumping area. The Belknap Property is not identified as an active cleanup site by Ecology.

Figure 3.11-3 Other Department of Ecology Cleanup Sites in the Vicinity of Base Seattle

Other Department of Ecology Cleanup Sites in the Vicinity of Base Seattle

FIGURE 3.11-3

MITAGS Property

The former Flint Ink site, which is located within the Port-owned MITAGS Property, was used as an ink manufacturing facility from 1950 to the early 1990s (Harding Lawson Associates 1995). As the Flint Ink site, the property included a 10,000-gallon UST containing diesel fuel and five ASTs containing finished ink products which could include pigments containing lead, lead chromate, and carbon black. The five ASTs have since been removed from the site. The UST remains but is believed to be empty (Harding Lawson Associates 1995).

The Flint Ink site has been the subject of several investigations dating back to as early as 1984. Previous investigations for spills and repeated illegal dumping detected cPAHs, TCE, lead, and diesel contamination in the soil underlying the site.

A remedial investigation conducted in 1994 for the Port of Seattle or the Terminal 30 Improvement Project focused on soil conditions of the Terminal 30 site but also addressed soil and groundwater conditions at the adjacent former Flint Ink site. The investigation identified shallow soil contamination of petroleum hydrocarbons. The investigation also found chlorinated hydrocarbons (i.e., TCE, dichloroethylene, and vinyl chloride) were present in groundwater and soils beneath the Flint Ink site. Most recently, the Phase II EDDA (2010) prepared by the Coast Guard identified TCE and chromium are present in shallow soil. Arsenic and vinyl chloride were also present in groundwater within the former product transfer area) and downgradient of former Flint Ink Building.

The Flint Ink site was previously listed as a cleanup site by the Department of Ecology for benzene, gasoline, and other petroleum hydrocarbon contaminates. The site has undergone remediation and the status was changed to No Further Action in October 2011 (Ecology 2020d).

Hazardous Materials Use and Storage at the Port of Seattle (Terminals 30 and 46)

Hazardous materials—including fuels, lubricants, and paint-related wastes—are used as a part of the daily operation of these terminals. No vessel maintenance or heavy-duty vehicle maintenance occurs on at either of these terminals. Therefore, hazardous materials are not routinely stored at these locations. Any hazardous wastes generated at Terminal 46 and Terminal 30 are collected from the terminals and disposed of in accordance with the Port's existing hazardous materials management programs and existing waste streams. The acceptance, handling, or storage of explosives or excessively flammable material is subject to special arrangements with terminal operators and governed by rules and regulations of federal, state, and local authorities. Hazardous cargoes must have been prepared for shipment in accordance with the applicable USDOT regulations contained in 49 CFR Part 49. Shippers, vessels, and inland carriers are warned that the party or parties responsible for infractions will be subject to penalties that may result for rules violations.

Hazardous Materials Use and Storage at Base Seattle

Base Seattle hosts a range of Coast Guard operation that use hazardous materials or generate hazardous wastes, including maintenance, cleaning, and fueling of vessels; operation of building emergency generators; fueling of material handling equipment; hazardous materials storage; and operation of a Hazardous Waste Accumulation Facility (HWAF). Primary types of hazardous wastes generated at Base Seattle include bilge water, POLs, paints (including aerosols), adhesives, sealants, PCBs, AFFF, batteries, filters, and lamps.

Storage Tanks On-Site

One double-walled, 6,000-gallon UST containing diesel fuel is located at the southwest corner of Building 2 in front of the Coast Guard Exchange (Coast Guard 2018b). The UST supplies fuel to Coast Guard vessels moored at the floating docks and to two emergency generators in Building 1. Nine ASTs are located across Base Seattle that store gasoline, diesel fuel, and fuel for emergency generators (Coast Guard 2018b).

Table 3.11-1 List of Potential Pollutants at Base Seattle

Chemical Product	Potential Pollutant Source Activities	Approximate Quantity (Gallons)	Storage Location
Diesel	Boat Refueling and Fuel Storage	14,100	Facility ASTs and UST
Gasoline	Boat Refueling	1,000	AST west of Building 1
Hydraulic Oil	Boat Maintenance	200	Outside, east of HAZMIN Center
Lubricating Oil	Boat Maintenance	200	Outside, east of HAZMIN Center
Cleaning Solution	Boat Cleaning and Maintenance	100	Outside, east of HAZMIN Center
Paints, Solvents, Cleaning Solution	Minor Deck Repair and Painting	Quantities Vary	Outside, covered area
Metals, Hydrocarbons, and Solvents	Indoor Maintenance	Quantities Vary	Primarily indoors

HAZMIN = Hazardous Material Minimization
Source: Coast Guard 2014

Hazardous Material Minimization Center

The Hazardous Material Minimization (HAZMIN) Center is a hazardous materials storage area at the southwest corner of Building 7. The HAZMIN Center typically contains products such as paint, cleaning supplies, fuel, oil, lubricants, and solvents. The HAZMIN Center has the capacity to store up to 110 gallons of oil (Coast Guard 2018b). Hazardous materials arrive at the HAZMIN Center through the loading dock at the west side of Building 7. Operation of the HAZMIN Center is considered a BMP because its operation coordinates the requisition of all chemicals used on-site and consolidates their proper storage. In effect, operation of the HAZMIN Center reduces overall quantities of hazardous material on-site and makes their handling safer and more efficient.

Hazardous Waste Accumulation Facility

Base Seattle generates 1,000+ kilograms of hazardous waste a month, making it an RCRA-designated Large Quantity Generator (LQG) (USEPA Identification No. WA6690331347). As an LQG, Base Seattle is subject to numerous special requirements, such as hazardous waste may not be accumulated on-site for more than 90 days, all shipments of hazardous waste off-site must be accompanied by a Uniform Hazardous Waste Manifest form, and extensive planning, training, inspection, and record keeping requirements. Hazardous wastes are routinely shipped off-site for disposal at Joint Base Lewis-McChord.

Hazardous wastes at Base Seattle are stored at the HWAF located near Building 14. Hazardous and dangerous wastes are stored in 10 different lockers to separate different types of waste materials. Stored waste materials include oil, gasoline, paints, batteries, solvents, oil/water mixtures, or emergency breathing/safety equipment. HWAF has the capacity to store up to 1,600 gallons of oil or oil water mixtures (Coast Guard 2018b). Gasoline and diesel fuel are also stored in flammable liquid storage lockers located adjacent to HWAF.

Satellite Accumulation Areas

A total of four hazardous waste satellite accumulation areas (SAA) are located at Base Seattle. Each SAA can store up to 55 gallons of an individual waste material near the point of generation. Once a storage container has been filled it is transported to HWAF within 3 days.

Hazardous Building Materials

Based on available reports, Buildings 1, 2, 3, 5, 6, and 7 have previously been surveyed for and identified as containing asbestos-containing materials (ACM). Building 7 was also surveyed for and found to contain lead-based paint. No hazardous building material surveys have been prepared for Building 8, Building 10, or the magazine located behind Building 10.

3.11.4 Environmental Consequences of the Action Alternatives

Land Acquisition

Land proposed for acquisition may be contaminated and/or may become a Superfund or a cleanup site by the Department of Ecology. For example, the Belknap property has potential soil and groundwater contamination documented in previous EDDAs. Hazardous material use and storage currently takes place on several other properties that may be acquired. Prior to any land acquisition the Coast Guard would complete all required due diligence assessment in accordance with the *Civilian Federal Agency Task Force (CFATF) Guide on Evaluating Environmental Liability for Property Transfers*, *American Society of Testing and Materials (ASTM) Stan*dard *Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E 1527-13*, and 40 CFR Part 312, *Innocent Landowners, Standards for Conducting All Appropriate Inquiries (AAI)* to determine potential recognized environmental concerns, including existing contamination and land use controls. Depending on the results of these due diligence assessments, the proposed land acquisition could involve sites with recognized environmental concerns or liabilities. While currently unknown, all clean-up terms and responsibilities would be negotiated and agreed to between the Coast Guard, the property owner, and any other relevant regulatory agencies (e.g., USEPA, Department of Ecology) as part of the land acquisition process.

Construction

The use and storage of minor amounts of hazardous materials and the generation of hazardous waste at Base Seattle would temporarily increase during construction due the use of heavy construction equipment, generators, power tools, and some building materials. Any hazardous materials used, or hazardous waste generated would be stored, managed, and disposed of in compliance with existing the Coast Guard Hazardous Waste Management Directive (COMDTINST M16478.1B) and all applicable federal, state, and local laws and regulations. A designated area for the storage of hazardous materials and wastes would be incorporated into the contracts for any project design documents (see Appendix E). An SPCC Plan would be prepared to outline procedures to be followed to minimize the likelihood of, and respond to, an accidental spill (see Appendix E).

Buildings 1, 2, 3, 5, 6, and 7 have been identified as containing ACM. Building 7 has been identified as containing lead-based paint. Proposed rehabilitation or demolition activities associated with these buildings may disturb ACM or lead-based paint, resulting in the potential for occupational exposures by construction workers and/or building occupants, and generation of hazardous waste. Characterization, handling, disposal, and reporting procedures are well established under federal, state, and local laws and regulations. Hazardous materials and wastes are managed in compliance with existing federal, state, and local laws and regulations as well as the Coast Guard Hazardous Waste Management Model Directive. Actions and procedures to address contamination encountered during construction are

standard ECMs that are incorporated into Coast Guard designs and specifications for construction (e.g., trained workers, personal protective equipment [PPE], medical surveillance, recordkeeping) (see Appendix E).

The proposed demolition activities, as well as the construction of new buildings, supporting infrastructure, and pavements, would also occur within, adjacent to, or in the vicinity of cleanup sites managed by the USEPA and/or Department of Ecology. Additionally, these activities could encounter previously unknown contamination. As a result, soil excavation, grading, and trenching could expose or otherwise disturb contaminated soil and/or groundwater. This includes ground disturbing activities associated with seismic stabilization, which would involve the installation of as many as 1,000 stone columns to a depth of 100 feet. Construction activities within the boundaries of these active cleanup sites would be coordinated with relevant regulatory agencies and would comply with all existing land use controls. If contaminated soils are encountered, they would be tested and managed in accordance with applicable laws and regulations including, if required, disposal within a Class I hazardous waste landfill (see Appendix E). The Coast Guard would ensure the implementation of dust abatement measures (see Appendix E) to avoid loose soil leaving the site (refer to Section 3.5, *Air Quality*).

The proposed modernization of Base Seattle would also include in-water construction activities that may be within the HISS East Waterway OU. The in-water work would be preceded by a CERCLA action to remove contaminated sediments (refer to Section 1.2.2, *Comprehensive Environmental Response, Compensation, and Liabilities Act Action at Base Seattle*). Such CERCLA-compliant removal actions are considered separate actions from that evaluated in this PEIS and are considered as cumulative projects in Chapter 4, *Cumulative Effects*.

It is anticipated that the separate CERLCA removal actions would remove known contaminated sediments to the maximum extent practicable. Subsequent in-water work may still encounter and disturb additional contaminated bottom sediments. Exposure of these contaminants could adversely affect water quality (refer to Section 3.3, *Water Resources*) and marine biological resources (refer to Section 3.6, *Biological Resources*) and would likely necessitate additional CERCLA removal actions. The full extent of contamination is unknown but any necessary removal action would be completed prior to construction. Therefore, there would be no significant impacts from hazardous masterials and wastes.

Long-term Operations

A number of existing hazardous material storage and use areas would be relocated as part of the Base modernization program. Additionally, the use of hazardous materials to support operations at Base Seattle may increase with the increase in vessel support functions. Use and storage would continue to be managed in compliance with existing federal, state, and local laws and regulations as well as the Coast Guard Hazardous Waste Management Directive.

Of the four SAAs at Base Seattle, the three would be relocated following demolition of associated buildings. Additionally, the existing HWAF in Building 14 would be demolished and reconstructed adjacent to the northeast corner of Building 7. There would be no change in the capacity or operation of the HWAF after construction is completed. The disposal of hazardous waste would continue to be managed in compliance with existing federal, state, and local laws and regulations as well as the Coast Guard Hazardous Waste Management Directive.

3.11.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Alternative 1, would include acquisition of a portion of the Belknap Property and a portion of Terminal 46. Petroleum hydrocarbons, cPAHs, and chromium (soil only) has been identified on the Belknap Property, but this property is not identified as an active cleanup site by Ecology. Terminal 46 has been listed on the Department of Ecology's Cleanup Site List since April 1990 for gasoline and diesel contaminants due to leaking USTs that were removed in 1991. Clean-up terms and responsibilities associated with the Belknap Property and Terminal 46 would be negotiated and agreed to between the Coast Guard, the Port, and other relevant regulatory agencies (e.g., Department of Ecology) prior to land acquisition.

The implementation of Alternative 1 would result in the use, storage, and disposal of hazardous materials during demolition, construction, and renovation activities. The implementation of Alternative 1 would result in the disturbance of hazardous building materials and the potential disturbance of contaminated soil and/or groundwater on Base Seattle and Terminal 46. This includes the potential disturbance of contaminated sediments associated with the proposed pier rehabilitation at Terminal 46. The full extent of contamination is unknown, but any necessary removal action would be completed prior to construction.

Long-term operational impacts associated with the storage, use, transportation, or disposal of hazardous substances under Alternative 1 would not substantially increase the human health risk or environmental exposure. The implementation of Alternative 1 would not disturb or create additional contamination resulting in adverse effects to human health or the environment.

Pursuant to NEPA, Alternative 1 would result in no significant impacts from hazardous materials and wastes becauseas any necessary removal actions would occur prior to implementation of Alternative 1, and no other long-term, significant impacts would be anticipated.

3.11.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

The implementation of Alternative 2 would include acquisition of a portion of Terminal 46, and a portion of Terminal 30 (including Jack Perry Memorial Park) as well as the Belknap property, the BNSF Railway property, and the MITAGS property. As described previously, the Belknap property, the BNSF Railway property, and the MITAGS property (Former Flint Ink site) each have potential soil and groundwater contamination. Terminal 46 and Terminal 30 are listed on the Department of Ecology's Cleanup Site List. The acquisition of a portion of Terminal 30 under this alternative would also include the Former GATX Facility. While currently unknown, all remaining clean-up terms and responsibilities would be negotiated and agreed to between the Coast Guard, the Port, and other relevant regulatory agencies (e.g., USEPA, Department of Ecology) prior to land acquisition.

Short- and long-term adverse impacts on hazardous materials and wastes would be similar to those described for Alternative 1. The implementation of Alternative 2 would result in the use, storage, and disposal of hazardous materials during demolition, construction, and renovation activities. The implementation of Alternative 2 would result in the disturbance of hazardous buildings materials on Base Seattle and the potential disturbance of contaminated soil and/or groundwater on Base Seattle, Terminal 46, and Terminal 30 as well as the other proposed acquisition properties. This includes the potential disturbance of contaminated sediments associated with the proposed pier rehabilitation at Terminal 46 and the development of two new berths at Piers 35E/F. The full extent of contamination is unknown, but any necessary removal action would be completed prior to construction. Long-term

operational impacts associated with the storage, use, transportation, or disposal of hazardous materials and wastes under Alternative 2 would not substantially increase the human health risk or environmental exposure. The implementation of Alternative 2 would not disturb or create additional contamination resulting in adverse effects to human health or the environment.

Pursuant to NEPA, Alternative 2 would result in no significant impacts from hazardous materials and wastes bcause any necessary removal actions would occur prior to implementation of Alternative 2, and no other long-term, significant impacts would be anticipated.

3.11.5 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

The implementation of Alternative 3 would result in the acquisition of the BNSF Railway property, MITAGS property (Former Flint Ink Site), and a portion of Terminal 46. As described previously, the BNSF Railway property and MITAGS property each have potential soil and groundwater contamination documented in previous EDDAs. Additionally, the Terminal 46 has been listed on the Department of Ecology's Cleanup Site List. While currently unknown, all remaining clean-up terms and responsibilities would be negotiated and agreed to between the Coast Guard, the Port, and other relevant regulatory agencies (e.g., USEPA, Department of Ecology) prior to land acquisition.

Short- and long-term adverse impacts on hazardous materials and wastes would be similar to those described for Alternative 1. The implementation of Alternative 3 would result in the use and storage of hazardous materials during demolition, construction, and renovation activities. The implementation of Alternative 3 would result in the disturbance of hazardous building materials on Base Seattle and the potential disturbance of contaminated soil and/or groundwater on Base Seattle and Terminal 46. This includes the potential disturbance of contaminated bottom sediments associated with the pier rehabilitation at Terminal 46 and the construction of one new berth at Pier 35.The full extent of contamination is unknown, but any necessary removal action would be completed prior to construction.

Long-term operational impacts associated with the storage, use, transportation, or disposal of hazardous materials and wastes under Alternative 3 would not substantially increase the human health risk or environmental exposure. The implementation of Alternative 3 would not disturb or create additional contamination resulting in adverse effects to human health or the environment.

Pursuant to NEPA, Alternative 3 would result in no significant impacts from hazardous materials and wastes becauseas any necessary removal actions would occur prior to implementation of Alternative 3, and no other long-term, significant impacts would be anticipated.

3.11.6 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, there would be no impacts on hazardous materials and wastes. While the use of hazardous materials and the generation of hazardous wastes would continue at Base Seattle, there would be no short-term increase associated with demolition, construction, and renovation activities. Operational use, storage, and disposal of hazardous materials and wastes would remain effectively unchanged from existing conditions. While the SAAs and HWAF would remain unchanged and would not be improved, hazardous materials and wastes at Base Seattle would continue to be managed in compliance with existing federal, state, and local laws and regulations as well as the Coast Guard Hazardous Waste Management Directive. Long-term cleanup activity by USEPA and the Department of Ecology at Base Seattle and the Port would continue in accordance with the existing Records of Decision.

3.11.7 Comparison of Alternatives

All alternatives, with the exception of the No-Action Alternative, would result in similar short- and long-term impacts on hazardous materials and wastes. Each of the alternatives would temporarily increase the use, storage, and disposal of minor amounts of hazardous materials at Base Seattle during the construction phase. All the alternatives, with the exception of the No-Action Alternative, would result in the disturbance of hazardous building materials as well as the disturbance of contaminated soils and/or groundwater. Given that any necessary removal action would however be implemented prior to construction, all alternatives would result in no significant impacts.

Long-term operations under all alternatives, with the exception of the No-Action Alternative, would result in increased use, storage, and disposal of hazardous materials and wastes. Each of these alternatives would also result in improvements to the existing HWAF and SAAs. None of the alternatives, including the No-Action Alternative, would impede the USEPA's ongoing cleanup operations at identified cleanup sites.

Therefore, pursuant to NEPA, the Proposed Action would result in no significant impactsfrom hazardous materials and wastes.

Table 3.11-2 Comparison of Alternatives for Hazardous Materials and Wastes

Comparison of Alternatives for Hazardous Materials and Wastes Impacts	
Alternative 1	No significant impacts
Alternative 2	No significant impacts
Alternative 3	No significant impacts
No-Action Alternative	No impacts.

3.11.8 Environmental Conservation Measures

Each of the alternatives would include the implementation of ECMs. Some of these measures (e.g., establishment of a storage area for hazardous wastes, preparation and implementation of a SPCC Plan, procedures to address contamination during ground disturbance) would serve to avoid or further minimize any potential impacts, particularly temporary, construction-related impacts and would apply to all action alternatives. For further details regarding these measures including how they would be implemented see Appendix E.

3.12 Visual Resources

Summary of Findings

The Proposed Action and its Action Alternatives would be visually consistent with ongoing industrial and water-related activities in the Greater Duwamish MIC and would have no significant impact on visual resources.

Under any of the Action Alternatives and the No-Action Alternative, no significant impacts on Visual Resources are expected to occur.

3.12.1 Background

Visual resources are features of urban (i.e., built) or natural environments with scenic value. These features form the overall impressions that an observer receives of an area or its landscape character. Key elements and features that create or enhance an area's visual quality include landforms, water surfaces, vegetation, and manufactured features and are considered characteristic of an area if they are inherent to the structure and function of a landscape. The sensitivity of visual resources is principally defined by how residents and visitors perceive the visual attractiveness of an area. At Base Seattle, which is located adjacent to the shoreline, natural visual resources that remain consist primarily of coastal visual resources.

3.12.2 Approach to Analysis

In evaluating potential impacts on visual resources, this analysis considers the level of visual sensitivity in the Project area. Visual sensitivity is defined as the degree of public interest in a visual resource and concern over adverse changes in the quality of that resource. In general, an impact to a visual resource could be adverse if the implementation of an action alternative would result in a substantial alteration to an existing sensitive visual setting, including spillover effects outside the Base (City of Seattle 2022; refer to Appendix G).

The City of Seattle's Comprehensive Plan has a goal to maximize both physical and visual access to shorelines; however, Base Seattle and the identified acquisition properties are located within the Greater Duwamish MIC, within which the primary goal is to provide for water-dependent and water-related industrial uses on larger lots (i.e., visual resources are not a primary consideration in the MIC). Therefore, the City of Seattle's goal of providing visual access must be balanced against the industrial and water-dependent uses that are prioritized in this area.

This analysis considers the potential of the Proposed Action, action alternatives, and the No-Action Alternative to result in incompatibilities with or alterations to existing visual resources.

3.12.3 Affected Environment

Local Setting

Aerial View of Coast Guard Base Seattle and Adjacent Port Facilities

At Base Seattle, which is located adjacent to the Puget Sound shoreline, natural visual resources are limited and consist primarily of coastal visual elements. The visual resources of most Port properties adjacent to the Base are characteristic of a heavily industrialized port complex. Further, these facilities are largely illuminated during nighttime hours. As with Base Seattle, most views of the Port are from vessels on Elliott Bay and motor vehicles along East Marginal Way South and SR 99. Views of Base Seattle and Port facilities from the water are not prominent because the locations support industrial development and container storage and are surrounded by marine-related land use activities and roadways that blend with adjacent land uses. Views from vehicles on adjacent roadways are mostly obstructed by perimeter fencing and port infrastructure. The Port properties are located in an industrial area with limited unique viewshed resources. Views from commercial and public boats along the Duwamish Waterway and Elliott Bay onto the Port properties consist of views of terminal storage and transportation uses. Port activities partially obstruct views of the Seattle skyline from the water. There are no designated scenic vista points, scenic corridors, or other sensitive viewpoints in the Project area.

Terminal 46

Terminal 46, located immediately north of Base Seattle, has been in its current configuration since 1980. Visually, this terminal is dominated by typical marine cargo features, such as cranes, container boxes, security fencing, and other port infrastructure. This property is completely developed and paved and does not contribute any natural or other visual elements or relief to the local setting.

Terminal 30

Terminal 30 is located just south of Base Seattle. Similar to Terminal 46, Terminal 30 is visually dominated by typical marine cargo features, such as cranes and container boxes. This property is completely developed and paved and does not contribute any natural or other visual elements or relief to the local setting.

MITAGS, Belknap, and BNSF Railway Properties

MITAGS (on the right)

The MITAGS property is located immediately west of Alaskan Way South and adjacent to Jack Perry Memorial Park. The MITAGS facility is on property leased from the Port and contains a single-story building dedicated to maritime training activities. This property is completely developed and paved and does not contribute any natural or other visual elements or relief to the local setting.

The Belknap property, located adjacent to Base Seattle's main gate, is owned by the Port of Seattle and is currently leased by the Coast Guard. This property completely paved and used primarily for equipment laydown and parking. The BNSF Railway property is a vacant gravel lot that currently does not have any developed features. Both of these properties are small, lack any visual features, and do not contribute measurably to the visual setting of the local area.

Jack Perry Memorial Park

Jack Perry Memorial Park, immediately south of Base Seattle, provides approximately 120 feet of public and visual access to the shoreline (Year of Seattle Parks 2020). Visually, the park is predominantly paved and lacks natural or scenic features beyond some modest landscaping. Primary views from the park are of dilapidated piers and the Duwamish River in the foreground, maritime industrial activities along the Duwamish and at Terminal 18, which is used by the largest container ships at the Port, in the middle-ground. To a limited degree, Elliot Bay and the Olympic Peninsula are visible in the background when atmospheric conditions allow. Base Seattle, adjacent to the park, is also a prominent foreground visual feature. The site is substantially developed but with limited visual aspects such that views from this site would be moderately sensitive to alternations in the viewshed.

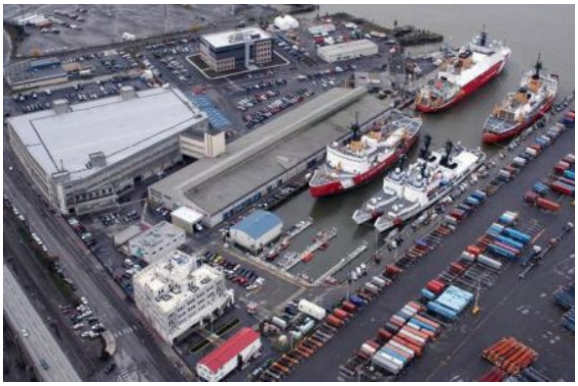
Portside Trail

The Portside Trail (also referred to as the Alaskan Way Trail) is a paved, partially striped pedestrian and bicycle path accessible at South Atlantic Street (northbound) and South King Street (southbound). The views from the trail are dominated by adjacent industrial development, Port and Base Seattle activities, vehicular traffic (comprised largely of heavy-haul trucks), and a highway overpass in the foreground, although there are limited, filtered views of Elliot Bay and the Olympic Peninsula in the background.

Portside Trail Adjacent to Base Seattle

Base Seattle

Base Seattle is dominated by maritime features that support Coast Guard functions, such as buildings and security fencing, as well as several large and medium Coast Guard cutters. Visually, these features are consistent with surrounding industrial development and activities.



Aerial View (from the North) of Base Seattle.

3.12.4 Environmental Consequences of the Action Alternatives

The strategies for land acquisition and post-acquisition uses would be the primary difference between action alternatives for potential visual consequences because some properties would be used differently than others.

Land Acquisition

Based on the purely transactional nature of land acquisition, this component of the proposed modernization would not impact visual resources.

Construction

All three action alternatives would result in construction, demolition, rehabilitation, and renovation activities on Base Seattle, which would require equipment movement, heavy machinery usage, installation of construction fencing, and materials storage. The Port complex and surrounding area is in nearly a constant state of change with crane and heavy equipment operations, vessel traffic, rail operations, and motor vehicle traffic, and with tenants routinely implementing construction activities. Coast Guard construction activities would be temporary in nature and would be visually consistent with ongoing activities associated with the industrialized waterfront, including those associated with Base Seattle, the Port of Seattle, and the surrounding industrial area.

Fugitive dust, a byproduct of these activities, would be generated during facility construction activities, including demolition of pavements and sidewalks, as well as excavation and grading in support of proposed development, which could adversely affect visual resources. Fugitive dust emissions can vary substantially depending on levels of activity, specific operations, and prevailing meteorological conditions. Fugitive dust could be visible from viewers both in the immediate vicinity and at distances, depending on the magnitude of dust generation. Although fugitive dust would result from demolition and grading activities, it would be temporary and would be reduced through the implementation of standard dust minimization practices, such as regular watering of exposed soils, soil stockpiling and coverage, etc. (see Appendix E). When properly implemented, these dust minimization measures can reduce dust generation by up to 50 percent (USEPA 2006) and minimize the impacts of fugitive dust on visual resources.

Overall, construction activities associated with the action alternatives would be visually consistent with the existing setting and would result in a minor, adverse impact to local or regional visual resources.

Long-term Operations

Potential effects to visual resources under long-term operation of the modernized Base would result from expanded security infrastructure (e.g., lighting, perimeter fencing) and an increased number of buildings. Although infrastructure (buildings, utilities, fencing, etc.) would be expanded upon program completion, the total footprint of the buildings would be approximately the same as at present. Although building designs and details are not yet developed (e.g., building materials, security fencing), the proposed facilities would likely be architecturally and functionally consistent with existing development at the Base and in the area. There may be some new visual obstruction for distant viewers because of taller building construction (the Base Administration Building, which is proposed to be a maximum of five stories, as compared to the current tallest building of four stories [Building 7]). Demolition of several structures in the northern portion of the Base would reduce visual obstructions and improve view corridors through the Base from the water and Alaskan Way South/SR 99. Upgraded and newly installed security lighting would incorporate use of appropriate lighting fixtures such as LED bulbs and hoods for down-cast lighting, which would minimize visual intrusion from light emissions as noted in Appendix E. Further, the Base and the Port are both currently secured facilities. As such, new security fencing would not introduce a new feature in the local visual setting but rather a reconfiguration of an existing one.

Overall, proposed infrastructure changes may alter or obstruct views from the surrounding area and Portside Trail; however, this development would be consistent with existing development at Base Seattle and the Port. Resulting views would not be substantially different from current conditions. The project components that are consistent across action alternatives would result in expanded facilities but would be largely consistent with current conditions.

3.12.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Visual impacts related to construction activities associated with Alternative 1 would be visually compatible with ongoing activities in the area. Fugitive dust generated during operations could result in short-term, minor, adverse impacts that can be minimized through standard construction practices.

Under this alternative, the Base Administration Building would be constructed within current Base boundaries and would be largely obscured from views by existing development (e.g., Building 7, should the building remain). If Building 7 is demolished, the proposed Base Administration Building would essentially obstruct the same views as Building 7 but may represent an improvement in views from the Portside Trail or Alaskan Way because of the vertical mass and close proximity of Building 7 to these viewers.

If Building 7 is demolished, replacement building(s) would be constructed on property acquired at Terminal 46 and would increase visual obstruction to viewers on the Portside Trail and Alaskan Way. The net change may be minor as Terminal 46 uses, including container storage, currently obstructs views across the property. Most of the property acquired at Terminal 46 would be used for ground operations, parking, and other visually non-intrusive uses (i.e., there would be no large-scale, tall, or massing structures that would block existing view corridors). No long-term impacts on visual resources are expected under this alternative.

When considered together with the impacts described for those common across all action alternatives, pursuant to NEPA, no significant impacts would occur to visual resources under Alternative 1.

3.12.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

Property acquisitions under Alternative 2 would displace operations in these areas but total less acreage than under Alternative 1. Compared to Alternative 1, this alternative would result in one less Coast Guard berth at Terminal 46 but would also involve a change in use within the northern portion of Terminal 30 by adding a Coast Guard berth there. Additionally, unlike operations at Terminal 46 and Terminal 30, which could likely be relocated within the Port, the functions at the MITAGS property would require relocation to a different Port property or off-site. Similar to Alternative 1, visual impacts related to construction activities would be visually compatible with ongoing activities in the area, and fugitive dust generated during operations could result in short-term, minor, adverse impacts that can be minimized through standard construction practices.

Under this alternative, new facilities and infrastructure would be consistent with the current landscape of the Base and the surrounding industrial Port area. The Base Administration Building would be constructed within current Base boundaries and would be largely obscured from viewers by the existing development. The new three-story Mission Support Building would be constructed in the southeast portion of the current Base boundaries. The majority of the property acquired at the adjacent southern portion of Terminal 46 and northern portion of Terminal 30 would be used for ground operations, security improvements (e.g., installation of new fencing), parking, and other non-intrusive visual uses. If Building 7 is demolished, replacement building(s) would be constructed on property acquired at Terminal 30 and would increase visual obstruction to viewers on the Portside Trail and Alaskan Way. The net change may be minor as Terminal 30 uses currently obstruct views across the property.

Displacement of Jack Perry Memorial Park would eliminate one of the few unobstructed public access viewpoints in area. While the park offers access for coastal shoreline viewing, the visual quality from the site is moderate to poor due to neighboring industrial uses. As such, the loss of this visual corridor would be minor.

When considered together with the impacts described for those common across all action alternatives, pursuant to NEPA, no significant impacts would occur to visual resources under Alternative 2.

3.12.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

Similar to Alternative 1, visual impacts related to construction activities would be visually compatible with ongoing activities in the area. Fugitive dust generated during operations could result in short-term, minor, adverse impacts that can be minimized through standard construction practices. Under Alternative 3, the five-story Base Administration Building would be constructed on the southeastern portion of property acquired at Terminal 46 and would be visible from Alaskan Way and other roads in the area (including viaducts). This development would be similar to existing development on adjacent Base Seattle and in the area, such as existing, isolated, three-story administrative building on the northern portion of Terminal 46. Building 12 would be reconstructed on the western portion of the property acquired on Terminal 46 and would not be visually intrusive given its small size. If Building 7 is demolished, replacement building(s) would be constructed on property acquired at Terminal 46 and would increase visual obstruction to viewers on Alaskan Way. The net change may be minor as Terminal 46 uses currently obstruct views across the property. The remainder of the property acquired at Terminal 46 would be used for ground operations, parking, and other non-intrusive visual uses. The proposed new three-story Mission Support Building would be constructed in the southern portion of the current Base boundaries. Although visible from off Base Seattle, the building would be consistent with other existing development on the Base and in the area. Given the consistency with existing

development within the area, no long-term impacts on visual resources are expected under this alternative.

When considered together with the impacts described for those common across all action alternatives, pursuant to NEPA, no significant impacts would occur to visual resources under Alternative 3.

3.12.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, no land acquisition would occur. The Coast Guard would continue leasing 2.79 acres of Port property to support implementation of ongoing mission activities. Neither the MITAGS facility nor Jack Perry Memorial Park would be displaced or otherwise impacted. No modernization efforts would be implemented at the Base. Existing operational inefficiencies would remain, and Base infrastructure and facilities would remain inadequate to accommodate the arrival of new vessels or personnel. With regard to visual resources, because no changes would be realized, no impacts would result from the No-Action Alternative.

3.12.6 Comparison of Alternatives

With the exception of the No-Action Alternative, all alternatives would impact visual resources associated with Base Seattle and surrounding environs. Alternative 1 would result in the greatest area of land acquisition and accompanying displacement of existing and potential future Port operations to enable Base expansion and modernization; however, proposed development at the Base would be visually consistent with both existing and zoned/permitted waterside and upland land use in the Lower Duwamish MIC and, although City of Seattle policies and objectives for visual quality do not apply to federal property, the proposed modernization of Base Seattle would not substantially conflict with these goals. Therefore, pursuant to NEPA, no significant impacts would occur to visual resources.

Table 3.12-1 Comparison of Alternatives for Visual Resources

Comparison of Visual Resource Impacts	
Alternative 1	No significant impacts.
Alternative 2	No significant impacts.
Alternative 3	No significant impacts.
No-Action Alternative	No impacts.

3.12.7 Environmental Conservation Measures

Each of the alternatives would include the implementation of ECMs. Although no significant impacts on visual resources have been identified, implementation of these measures would serve to avoid or further minimize any adverse temporary or operational impacts. Further details regarding implementation and compliance with these measures are provided in Appendix E.

3.13 Recreational Resources

Summary of Findings

The Proposed Action and its Action Alternatives would not displace any heavily used recreational activities or opportunities. Therefore, pursuant to NEPA, no significant impacts on recreational resources would be expected under all alternatives, including the No-Action Alternative.

3.13.1 Background

Recreational resources comprise those activities or settings, either natural or manmade, that are designated or available for recreational use by the public. In general, recreation refers to activities that individuals choose to do to refresh their bodies and minds which makes their leisure time more interesting and enjoyable. Examples of recreational activities include walking, hiking, swimming, dancing, and playing games or sports. More passive recreational activities can include uses such as enjoyment of views, reading, and entertainment (e.g., attending a sporting event). These uses may not be formally zoned as "recreational" but may be present in and around the Project area. Recreational opportunities and resources can be an important component of an area's economy and the lifestyle of its residents. For a discussion of usual and accustomed (U&A) fishing areas, refer to Section 3.8, *Cultural Resources*.

3.13.2 Approach to Analysis

This analysis considers the potential for the action alternatives or the No-Action Alternative to result in incompatibilities with or loss of existing recreational resources. Evaluating impacts on recreational resources is based on several factors, including the number and type of such resources available in the region; the City of Seattle in this case.

Recreational land uses are highly valued in the City of Seattle, as reflected in the City's extensive data gathering, planning, and implementation of recreational programs, including the creation of the Seattle Park District in 2014 and the adoption of a new Parks and Open Space Element in the City's Comprehensive Plan in 2016. The City of Seattle Parks and Recreation (SPR) manages extensive system of parks and natural areas throughout the City. The SPR's Strategic Plan for Seattle Parks and Recreation 2020-2032 guides the City's priorities and investments based on the "three pillars of [their] vision of Healthy People, a Healthy Environment, and Strong Communities" (City of Seattle 2020). The City of Seattle's Shoreline Master Program addresses a range of physical conditions and development settings along local shorelines (City of Seattle 2020).

Base Seattle and identified properties proposed for acquisition are in the Greater Duwamish MIC, within which the goal is to provide for water-dependent and water-related industrial uses on larger lots (i.e., prioritizing industrial over recreation). As such, recreational resources in the Project area are not a land use priority in the City's planning. The analysis focuses on the properties and local features that offer recreational opportunities to the general public. (For a discussion of nearby land use activities [e.g., activities associated professional sports organizations], see Section 3.1, *Land Use*.)

3.13.3 Affected Environment

Local Setting

Commercial and recreational activities tend to be clustered in the City's downtown and waterfront districts, and manufacturing and industrial development tends to extend south from downtown toward the Port of Seattle and Base Seattle.

Recreational uses at Base Seattle and in the surrounding area largely include outdoor activities (e.g., walking, running) in which area residents or visitors participate, typically on weekends or during vacation periods. Recreational resources in the area include Jack Perry Memorial Park and the Portside Trail (also an element of the local transportation network), described further below.

Access to Base Seattle and the Port of Seattle properties relevant to the project, from either the waterside or landside, is restricted and continually monitored for security and safety purposes. Only Jack Perry Memorial Park is open for public Coastal Access. Base Seattle and properties proposed for acquisition under all the action alternatives (BNSF Railway, Belknap, MITAGS, Terminal 46, and Terminal 30) are not open to the public for access or recreation.

Security Fencing at Base Seattle

Jack Perry Memorial Park

Jack Perry Memorial Park, located at 1700 East Marginal Way South, adjacent to and directly south of Base Seattle and immediately north of Terminal 30. The park is a Port of Seattle-owned facility developed by the Port of Seattle to satisfy public access requirements related to the previous expansion of Terminal 30. It is a 1.1-acre coastal waterfront park located at the northern edge of Pier 34. The Park provides approximately 120 feet of public shoreline access (Year of Seattle 2020). The park provides a unique public access opportunity to the shoreline in the Lower Duwamish MIC. The park itself is almost entirely paved and has free parking for approximately six vehicles. It is lacking in natural features beyond some modest landscaping. The park offers no restroom facilities, no potable water sources, no food services, no picnic tables or shelters, no campsites, and is not wheelchair accessible (Paddling.com 2022). Recreational opportunities at the park are limited and predominantly passive in nature such as watching cargo-related activities at Terminal 18, which is used by the largest container ships at the Port. While it is possible to launch small personal watercraft (e.g.,

Jack Perry Memorial Park

kayaks), there is no boat ramp and access to the water requires traversing a series of large rocks that can be difficult to navigate safely. Jack Perry Memorial Park is not addressed in the SPR Strategic Plan.

Portside Trail

The Portside Trail (also referred to as the Alaskan Way Trail), was opened for public use in 2011 by WSDOT and is a partially striped pedestrian and bicycle path accessible at South Atlantic Street (northbound) and South King Street (southbound). The trail includes permanent barriers that separate users from vehicles on Alaskan Way. A segment of the trail runs along the perimeter fence around portions of Base Seattle and Terminal 46. The trail provides recreational opportunities for pedestrians and cyclists. The trail's proximity to busy roads and industrial development makes it a less desirable facility than other recreational opportunities in the greater Seattle area. There are numerous other pedestrian and bicycle trails or bicycle lanes in the Downtown Seattle area (SDOT Bike Map 2020). The Portside Trail is the nearest trail. It does not directly connect to any of these other facilities and is used primarily for commuting or traveling between other destinations. The Portside Trail is not addressed in the SPR Strategic Plan.

Portside Trail

3.13.4 Environmental Consequences of the Action Alternatives

Impacts on recreational resources that would be common to all three action alternatives are described here. Sections 3.13.4.1 through 3.13.4.3 provide a description of impacts that are unique to each action alternative.

Land Acquisition

Based on the purely transactional nature of land acquisition, this component of the proposed modernization project would not directly impact recreational resources.

Construction

All three action alternatives would result in construction, demolition, rehabilitation, and renovation activities on Base Seattle and any acquired properties. Construction activities would require equipment movement, use of heavy machinery, installation of construction fencing, and materials storage that could affect recreational users. (See Section 3.4, *Transportation*, for a discussion of construction-related traffic impacts.) These activities would be temporary in nature and would be consistent with ongoing activities associated with the industrialized waterfront, including those associated with Base Seattle, the Port of Seattle, and the surrounding industrial area. The Port complex and surrounding area is in a nearly constant state of change, with crane and heavy equipment operations, vessel traffic, rail operations, and motor vehicle traffic. Port tenants routinely implement construction, demolition, rehabilitation, and renovation activities as they establish and terminate operations.

In addition, that area contains only transitory or low-intensity recreational resources that would not be substantially affected by temporary construction activities. Therefore, construction, demolition, rehabilitation, and renovation activities associated with the action alternatives would be consistent with the existing setting and would represent a negligible impact to local or regional recreational resources.

Long-term Operations

Long-term operation of the expanded and modernized Base would not have the potential to affect land-based recreational uses on the Base or properties proposed to be acquired since none currently offer such opportunities. Furthermore, regardless of the action alternative selected, the Portside Trail—which runs adjacent to the Base and properties proposed to be acquired—would remain intact and would not require any changes to its configuration, access, or functionality. Impacts on Jack Perry Memorial Park specifically under Alternative 2 are discussed in Section 3.13.4.5.

Newly established security perimeters around acquired properties would impact the ability of water-based recreational activities (e.g., kayakers would not be able to approach the shore adjacent to Base Seattle for security reasons). Waterways adjacent to the Base are however not heavily used for recreational boating, and security perimeters are already in place adjacent to Port facilities, and changes would be negligible.

3.13.4.1 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

Selection of Alternative 1 would result in no changes to local recreational resources. Neither the current Base Seattle property nor properties proposed to be acquired under Alternative 1 offer public recreational opportunities. When considered collectively with impacts described for those common across all action alternatives, pursuant to NEPA, no significant impacts would occur to recreational resources under Alternative 1.

3.13.4.2 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

Jack Perry Memorial Park

Under Alternative 2, there would be a loss of 1.1 acres of recreational space and associated recreational opportunities from the loss of Jack Perry Memorial Park. As described previously, the park itself is predominantly paved and lacks in natural features beyond modest landscaping. Recreational opportunities at the park are limited. The limited space available at Jack Perry Memorial Park is not conducive to other sporting activities such as running, cycling, softball, ultimate frisbee or other sports (see photo, which depicts the entirety of the green space within the park). Further, the park offers no restrooms, no potable water, no food services, no picnic facilities. Beyond Americans with Disabilities Act-compliant parking and pavements, the park does not provide facilities that are readily accessible by persons with physical disabilities. Jack Perry Memorial Park is not addressed in the SPR Strategic Plan and does not contribute substantively to recreational resources in the region. While newly established security perimeters adjacent to this area would restrict water-based recreation (e.g., kayaking), the removal of this public access to local waterways would render this type of recreation difficult. Therefore, other than long-term, moderate adverse impacts from the loss of a public coastal access point, impacts on recreational resources associated with the displacement of Jack Perry Memorial Park would be minor. Ultimately, when considered together with the impacts described for those common across all action alternatives, no significant impacts would be expected on recreational resources under Alternative 2.

3.13.4.3 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

Selection of Alternative 3 would result in no changes to local recreational resources beyond those described as common to all action alternatives. Both Jack Perry Memorial Park and the Portside Trail would experience no changes in access, configuration, or functionality. When considered collectively with impacts described for those common across all action alternatives, and pursuant to NEPA, no significant impacts would occur to recreational resources under Alternative 3.

3.13.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, no land acquisition would occur, and no modernization efforts would be implemented at Base Seattle. Jack Perry Memorial Park and the Portside Trail would not be displaced or otherwise impacted and would continue to be used by the general public for limited recreational purposes. There would be no impacts to recreational resources.

3.13.6 Comparison of Alternatives

Except for Alternative 2, all alternatives, including the No-Action Alternative, would not impact recreational resources at Base Seattle or in the surrounding area. Alternative 2 would result in the displacement of Jack Perry Memorial Park. As described above—other than the elimination of a point of public access to the waterfront—this park offers limited recreational opportunities. Therefore, pursuant to NEPA, no significant impacts would be expected on recreation under all alternatives.

Table 3.13-1 Comparison of Alternatives for Recreational Resources

Comparison of Alternatives for Recreational Resource Impacts	
Alternative 1	No significant impacts.
Alternative 2	Moderate adverse impacts due to loss of public coastal access point and Jack Perry Memorial Park. No significant impacts.
Alternative 3	No significant impacts.
No-Action Alternative	No impacts.

3.13.7 Environmental Conservation Measures

Each of the action alternatives would include the implementation of relevant ECMs. Although no significant impacts on recreational resources have been identified, incorporation of some of these measures for other resource areas would also serve to avoid or further minimize any adverse temporary or operational impacts on recreation. Details regarding implementation and compliance with these measures are provided in Appendix E.

3.14 Greenhouse Gas Emissions and Climate Change

Summary of Findings

The Proposed Action and its Action Alternatives would result in temporary GHG emissions during construction activities. With the implementation of sustainability measures, any long-term increases in GHG emissions would be minor. Therefore, no significant impacts on GHG emissions and climate change would be expected.

3.14.1 Background

The Earth's natural warming process is known as the "greenhouse effect." The Earth's atmosphere consists of a variety of gases that regulate the Earth's temperature by trapping solar energy. These gases – carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride, and sulfur hexafluoride – are cumulatively referred to as GHGs because they trap heat like glass of a greenhouse. Relying on decades of research, the overwhelming majority of the scientific community agree that anthropogenic activities, which include the burning of fossil fuels to produce energy and deforestation, have contributed to elevated concentration of GHGs in the atmosphere since the Industrial Revolution. The human production and release of GHGs to the atmosphere have caused an increase in the average global temperature. While the increase in global temperature is known as "global warming," the resulting change in a range of global weather patterns is known as "global climate change." The USEPA defines global climate change as *"any significant change in the measures of climate lasting for an extended period of time."* In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer. These changes are caused by a number of natural factors, including oceanic processes, variations in solar radiation received by Earth, plate tectonics and volcanic eruptions as well as anthropogenic (i.e., human-related) activities (USEPA 2019).

Different GHGs can have different effects on the Earth's warming. Two key ways in which these gases differ from each other are their ability to absorb energy (i.e., their "radiative efficiency"), and how long they stay in the atmosphere (i.e., their "lifetime"). Global warming potential was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO_2. The larger the global warming potential, the more that a given gas warms the Earth compared to CO_2 over that time period. Because the global warming potential that each GHG has on climate change varies, the common metric of CO_2e is used to report a combined impact from all of the GHGs. This metric scales the global warming potential of each GHG to that of CO_2 with applicable global warming potentials applied pursuant to 40 CFR Part 98.

3.14.2 Approach to Analysis

The analysis of GHG emissions and climate change is fundamentally different in approach to the analysis of air quality (refer to Section 3.5, *Air Quality*). While air quality is linked to the geographical location and physical features within a particular airshed, GHG emissions have effects on a global scale. Within the global context of climate change, it is important to consider whether GHG emissions represent "new" emissions or are replacing or relocating existing GHG emissions from one location to another. In certain circumstances, particularly where new development reduces existing vehicle trip generation or vehicle trip lengths, GHG emissions can be reduced. This makes an analysis of GHG emissions

substantially different from an analysis of air quality, which simply considers any new addition of air pollutant emissions to an airshed and does not consider reductions to or offsets in air pollutant emissions within other airsheds.

The analysis of GHG emissions discusses GHG emissions relative to national, local, and state-wide inventories. This proportionate estimate of GHG emissions serves as a reasonable proxy for assessing potential climate change impacts. The current state of climate science does not allow for specific linkage between particular GHG emissions and particular climate impacts and given the uncertainties around the construction timing and the operational parameters of the proposed modernization of Base Seattle, it is difficult to accurately quantify construction-related and operational GHG emissions. The use of the information currently available (i.e., use of the emissions analysis described below as a proxy for climate impacts) is consistent with CEQ regulations. Additionally, consistent with EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, the Social Cost of Carbon (SCC) has also been considered in the assessment of GHG emissions. The SCC is the monetary value of the net harm to society associated with adding a small amount of that GHG to the atmosphere in a given year. In principle, it includes the value of all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services.

GHG emissions can include the release of stored GHGs from existing carbon stocks. Because the Proposed Action and its alternatives would not release GHGs from carbon stocks, the release of these types of emissions are not included in the analysis. There would be no natural sources of emissions and no measurable amount of carbon sequestration. This analysis focuses on the reasonable measurable emissions from fossil fuel consumption that could occur under each alternative. Additionally, GHG calculations use “discount rates” to help account for uncertainty in emissions per capita each year. This means that precise discounting of a stream of future emissions requires the SCC for each year together with the certainty-equivalent discount factor for that year. Discount rates also account for intergenerational impacts due to the long-lived nature of GHG emissions. This analysis considers the impacts of all four discount rates to provide a range of what the SCC of carbon could be (U.S. Government 2021).

Additionally, due to the programmatic nature of this PEIS there are areas of large uncertainty. They include:

- when net zero emissions would be obtained,
- the rate of emission reduction, and
- the staggering of the construction schedule.

The emissions calculated in Appendix J were used to help calculate the SCC. To provide a more comprehensive look at GHG emissions, the year total 2028 emissions were used to calculate the SCC for construction equipment emissions (see Section 3.5 Air Quality). The appropriate discount rates for each year were then applied to the 2028 emissions totals to get the SCC.

3.14.3 Affected Environment

National Greenhouse Gas Emissions

Based on the latest 2020 EPA's annual Inventory of U.S. Greenhouse Gas Emissions and Sinks prepared by the USEPA, in 2020 U.S. GHG emissions totaled 5,981.354 million metric tons (MMT) of CO_2e, or 5,222.411 MMT of CO_2e after accounting for sequestration from the land sector (USEPA 2022).

GHG emissions have decreased nationally by 7.3% between 1990 and 2020. See Table 3.14-1 for 2020 National total annual GHG emissions.

Table 3.14-1 National Total Annual GHG Emissions (2020)

Source	GHG Emissions (MMT CO_2e)
Transportation	1,627.61
Electric Power Sector	1,482.18
Industry	1,426.20
Agricultural	635.11
Commercial	425.31
Residential	361.95
U.S. Territories	22.99
Total GHG Emissions	**5,981.35**

Source: USEPA 2022

Regional Greenhouse Gas Emissions

Based on the latest 1990-2019 Inventory Report prepared by the USEPA, in 2019 U.S. GHG emissions totaled 6,558 million metric tons (MMT) of CO_2e, or 5,769 MMT of CO_2e after accounting for sequestration from the land sector (USEPA 2021d).

In 2018, GHG emissions in the State of Washington totaled 99.57 MMT of CO_2e (Ecology 2021b). Additionally, the Greenhouse Gas Reporting Program (GHGRP) collects GHG data from large emitting facilities, supplier of fossil fuels and industrial gases that result in GHG emissions when used, and facilities that inject CO_2 underground. In 2018, 16 stationary sources in King County reported GHG emissions totaling 1,044,873 metric tons (MT) of CO_2e (Ecology 2021a).

Table 3.14-2 Washington State Total Annual GHG Emissions (2018)

Source	GHG Emissions (MMT CO_2e)
Electricity	16.21
Residential/Commercial/Industrial	23.28
Transportation	44.73
Fossil Fuel Industry	0.83
Industrial Process	5.42
Waste Management	2.39
Agriculture	6.71
Total GHG Emissions	**99.57**

Source: USEPA 2020b

Port of Seattle/Northwest Seaport Alliance Emissions

The Puget Sound Maritime Emissions Inventory quantifies maritime-related emissions and compares emissions levels against previous inventories (Starcrest Consulting Group, LLC 2018). The inventory includes data from major Puget Sound ports, the Washington State ferry system, regional rail operators, Port-related petroleum facilities, and other non-military vessel operators. The Port of Seattle includes four container terminals that cover more than 500 acres. Hundreds of trucks transit the Port each day, moving cargo to rail lines or other destinations (Port of Seattle 2016). These terminal operations contribute to annual GHG emissions at the Port.

The most recent inventory for the Port was prepared in 2016. It was updated in 2018 to provide new information on cargo volumes and allocation of emission sources between the Port of Seattle and NWSA. This inventory determined that GHG emissions in 2016 were lower than levels inventoried in 2005 (Starcrest Consulting Group, LLC 2018). Much of the emissions reductions were due to substantial voluntary investments in cleaner equipment, vessels, trucks, and fuels by the Port, the maritime industry, and government agencies, along with efforts to improve operational efficiency. The emissions profile does not include maritime operations emissions that are associated with Washington State Ferries, Coast Guard, and other waterfront industries.

Table 3.14-3 Port of Seattle Maritime GHG Emissions

Source	2005 GHG Emissions (MT CO_2e)	2016 GHG Emissions (MT CO_2e)
Ocean-going vessels	70,909	58,554
Harbor vessels	2,967	4,084
Recreational vessels	7,869	6,702
Locomotives	7,547	4,541
Cargo-handling equipment	3,927	565
Heavy-duty vehicles	13	15
Fleet vehicles	660	260
Total	**93,892**	**74,721**

Source: Starcrest Consulting Group, LLC 2018

Base Seattle GHG Emissions

Stationary source GHG emissions at Base Seattle are primarily pier-side infrastructure that supports homeported vessels at berth, such as emergency generators. Additional stationary source emissions are associated with HVAC and other utilities usage associated with shore-side infrastructure, including the 10 existing buildings on Base. Mobile source GHG emissions associated with Base Seattle are generally related to support equipment on Base, vehicular trips in support of Base operations, and commute trips by Base personnel. Additional mobile source GHG emissions associated with operation of vessels, including the major cutters and small boats, may occur both within the air basin (small boats and transiting cutters) and outside the air basin (cutter operations).

3.14.4 Environmental Consequences of the Action Alternatives

Land Acquisition

Property acquisition under any of the alternatives would result in the displacement of existing Port operations, such as cargo storage, transport, and related services. These displaced functions would either be eliminated or relocated elsewhere within Port property. If these functions were to be eliminated, associated operational GHG emissions (e.g., mobile source emissions associated with the transport of cargo containers) would also be eliminated. If these functions were relocated, there would be changes in long-term mobile source GHG emissions (e.g., associated with the change in distance that trucks would be required to travel in order to transfer cargo containers). It is highly likely that existing Port functions would be relocated elsewhere within the Port. Therefore, changes in GHG emissions would be negligible. Emissions associated with the relocated functions would remain within the airshed and any changes in emissions would be unchanged.

Construction

Similar to criteria air pollutant emissions described in Section 3.5, *Air Quality*, construction, demolition, rehabilitation, and renovation activities associated with the proposed modernization of Base Seattle would result in temporary GHG emissions.

Emissions would result from mobilization, staging, and construction support activities. Construction traffic, including export of demolition debris, delivery of materials, and construction worker commutes, would increase the number of vehicles transiting on local and regional roadways, and temporarily result in additional GHG emissions. The use of heavy construction equipment for landside construction activities and in-water construction activities would also generate short-term increases in GHG emissions (see Table 3.1-4). GHG emissions associated with heavy construction equipment would be similar to those found in most common construction activities. Associated calculated SCC costs are shown in Tables 3.1-5 and 3.1-6.

Table 3.14-4 Annual GHG Emissions During Construction

Total CO_2e Emissions Totals				
Year	**CO_2 tons/year**	**CH_4 tons/year**	**CO_2e tons/year**	**CO_2e MMT/year**
2022	9,503.59	0.4259	9,514.23	0.0095
2023	7,405.51	0.3442	7,414.11	0.0074
2024	8,060.61	0.3587	8,069.57	0.0081
2025	10,605.53	0.4278	10,616.22	0.0106
2026	14,792.39	0.6238	14,807.98	0.0148
2027	16,756.79	0.7053	16,774.42	0.0168
2028	20,868.00	0.8004	20,888.01	0.0209
2029	19,643.44	0.7707	19,662.70	0.0196
2030	18,403.64	0.7324	18,421.95	0.0184
2031	18,851.06	0.7848	18,870.68	0.0189
2032	19,261.33	0.8058	19,281.47	0.0193
2033	19,261.33	0.8058	19,281.47	0.0193
Total	**183,413.19**	**7.5856**	**183,602.83**	**0.1834**

Note: 1 CH_4 = 25 Metric Tons of Co_2e

Table 3.14-5 Maximum Estimated Construction-related Heavy Haul Truck Trip GHG Emissions

Year	Mileage	Emissions (tons/ year)		GHG SCC 5%		GHG SCC 3%		GHG SCC 2.5%		GHG SCC 95th Percentile	
		CO_2	CH_4	CO_2	CH_4	CO_2	CH_4	CO_2	CH_4	CO_2	CH_4
2023	0	0.000	0.000	$0	$0	$0	$0	$0	$0	$0	$0
2024	352,000	504.12	0.009	$8,066	$7	$27,727	$15	$41,338	$19	$83,685	$38
2025	1,312,000	1879.01	0.032	$31,943	$26	$105,224	$55	$156,958	$71	$317,552	$145
2026	256,000	366.64	0.006	$6,233	$5	$20,898	$11	$30,797	$14	$63,428	$30
2027	96,000	137.49	0.002	$2,475	$2	$8,112	$4	$11,824	$5	$24,198	$11
2028	2,176,000	3116.40	0.053	$56,095	$47	$186,984	$101	$271,127	$128	$560,953	$261
2029	1,600,000	2291.47	0.039	$43,538	$36	$139,780	$75	$201,650	$98	$419,340	$200
2030	1,280,000	1833.18	0.031	$34,830	$30	$113,657	$63	$163,153	$78	$342,804	$163
2031	160,000	229.15	0.004	$6,645	$4	$14,436	$8	$20,852	$10	$43,767	$21
2032	0	0.00	0.000	$0	$0	$0	$0	$0	$0	$0	$0
2033	0	0.00	0.000	$0	$0	$0	$0	$0	$0	$0	$0
	Total	**10,357**	**0**	**$189,826**	**$156**	**$616,819**	**$331**	**$896,699**	**$424**	**$1,855,727**	**$869**
				TOTAL	**$189,981**		**$617,150**		**$897,124**		**$1,856,596**

Note: See Appendix J for mileage assumptions, emissions factors, and relevant references.

Table 3.14-6 Maximum Estimated Annual Construction Worker Commute GHG Emissions

Year	Mileage	Emissions (tons/ year)		GHG SCC 5%		GHG SCC 3%		GHG SCC 2.5%		GHG SCC 95th Percentile	
		CO_2	CH_4	CO_2	CH_4	CO_2	CH_4	CO_2	CH_4	CO_2	CH_4
2023	0	0.000	0.000	$0	$0	$0	$0	$0	$0	$0	$0
2024	272,000	150.97	0.006	$2,416	$5	$8,304	$10	$12,380	$13	$25,062	$26
2025	280,000	155.41	0.006	$2,642	$5	$8,703	$10	$12,899	$13	$26,265	$27
2026	288,000	159.85	0.006	$2,718	$5	$9,112	$11	$13,428	$14	$27,655	$29
2027	1,240,000	688.26	0.027	$12,389	$23	$40,607	$48	$59,190	$62	$121,134	$129
2028	1,480,000	821.47	0.032	$14,796	$28	$49,288	$61	$71,468	$77	$147,865	$157
2029	760,000	421.84	0.016	$8,015	$15	$25,732	$31	$37,122	$41	$77,196	$84
2030	552,000	306.39	0.012	$5,821	$11	$18,896	$24	$27,268	$30	$57,294	$62
2031	48,000	26.64	0.001	$773	$1	$1,678	$2	$2,424	$3	$5,089	$5
2032	0	0.000	0.000	$0	$0	$0	$0	$0	$0	$0	$0
2033	0	0.000	0.000	$0	$0	$0	$0	$0	$0	$0	$0
	Total										
				TOTAL	**$189,981**		**$617,150**		**$897,124**		**$1,856,596**

Note: The heavy construction equipment GHG emissions quantified in Table 3.1-4 are associated with the hours of equipment operation and independent of the specific location of these activities.
See Appendix J for construction equipment operation assumptions, emissions factors, and relevant references.

Heavy construction equipment is in operation currently within the airshed and may be redistributed from other projects to support of the proposed construction, demolition, rehabilitation, and renovation activities at Base Seattle. As such, these GHG emissions may not necessarily constitute new sources of emissions. Even with conservative assumptions (e.g., all heavy equipment in operation for 8 hour per day, 5 days per week, 12 months per year; refer to Chapter 2, *Description of Proposed Action and Alternatives*), when compared to GHG emissions in the State of Washington (99.57 MMT CO_2e in 2018), and King County (1.0 MMT of CO_2e in 2018) construction-related GHG emissions would be negligible.

Long-term Operations

The replacement of existing facilities at Base Seattle with new and expanded facilities would support existing and programmed operations as well as an associated increase in personnel. As described in Chapter 2, *Description of Proposed Action and Alternatives*, the Base population could reach as many as 1,903 assigned personnel and 706 contract personnel by 2032 (i.e., an increase of approximately 763 personnel). While the GHG emissions associated with increased personnel and overall development footprint on Base would increase, the replacement of outdated facilities at Base Seattle would likely offset or reduce the total operational GHG emissions. In accordance with applicable laws and regulations, Coast Guard policy (Coast Guard 2014), and Coast Guard guidance (Coast Guard 2020), the Coast Guard would include design elements in construction projects to improve resiliency and sustainability of future facilities. The Coast Guard would conduct construction in accordance with The Guiding Principles for Sustainable Federal Buildings and Associated Instructions (CEQ 2020) or applicable guidance at the time of construction. The Guiding Principles provide agencies with a means to meet statutory provisions relating to high-performance sustainable buildings. The guiding principles ensure federal buildings:

- Employ integrated design principles,
- Optimize energy performance,
- Protect and conserve water,
- Enhance the indoor environment,
- Reduce the environmental impact of materials,
- Assess and consider building resilience.

In addition, in accordance with EO 14057, and the accompanying Federal Sustainability Plan, the Coast Guard would target the following objectives in the redevelopment of Base Seattle:

- Net-zero emissions operations by 2050 (65% GHG reduction from 2008 levels by 2030),
- 100% CFE by 2030 (50% on a 24/7 basis),
- Net-zero emissions buildings by 2045 (50% reduction by 2032),
- 100% net-zero emission vehicle acquisition by 2035 (100% light-duty acquisitions by 2027),
- Net-zero emissions procurement by 2050,
- Climate resilient infrastructure and operations, and
- Climate and sustainability-focused workforce.

All actions pursuant to the objectives of the Guiding Principles must be consistent with applicable laws and regulations and are subject to the availability of appropriations or other authorized funding.

Because the Coast Guard is only in the programmatic level of planning for Base Seattle modernization, it has not initiated detailed design for any future construction projects. In seeking to meet the objectives of the guiding principles, future planning and designs may consider a wide range of design features and

compliance with evolving guidance and EOs in place at the time (see Section 3.10, *Utilities and Public Services*). These design features would result in overall improvements to building and operational efficiencies, which would result in an overall reduction in GHG emissions associated with long-term operations of the Base. It is not possible to estimate the complete lifecycle cost of operation because it is unknown when net-zero emissions would be achieved, the design of the buildings being operated, energy profile of the buildings, amount of reduction each year, and amount of years that the facility could be in operation. Therefore, this analysis assumes a 2033 completion date to correspond with the implementation of the modernization program.

Operations and associated personnel could result in a build-out Base population of up to 1,903 assigned personnel and up to a maximum of 706 contract personnel. This represents a conservative estimate of the Base population given that hundreds of Coast Guard personnel may be out to sea at any given time and therefore would not be commuting daily to the Base. GHG emissions estimates associated with vehicle trips are shown in Table 3.14-7.

Given that construction activities would occur concurrently with regular Base operations, GHG emissions from these different activities previously discussed would occur simultaneously. Table 3.14-8 aggregates the SCC associated with GHG emissions from the different sources associated with construction and operational activities.

EO 13990 reconvened the Interagency Working Group on the Social Cost of Greenhouse Gases to oversee the process for updating estimates and promulgating social costs of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) for agencies to apply during cost-benefit analysis. The SCC associated with the proposed construction activities and operational commute trips that would occur during the implementation of the project would resultin a range of about $3.6 million to $33.3 million. This amount does not take into account the long-term lifecycle of an expanded Base Seattle.

3.14.4.2 Alternative 1 – Modernization with Additional Land and Two Berths at Terminal 46 (Preferred Alternative)

The implementation of Alternative 1 would result in the displacement of cargo storage operations within Terminal 46. These displaced functions would either be eliminated or relocated elsewhere within Port property. If eliminated, there would be a consequent reduction in GHG emissions from reduced Port activities. If relocated, there would not result in any measurable change in GHG emissions related to stationary or mobile source emissions.

Short-term, adverse impacts on stationary and mobile source GHG emissions would be similar to those described above. Similar to the criteria air pollutant analysis provided in Section 3.5, *Air Quality*. Specific construction activities under Alternative 1 would fit within these assumptions and therefore, GHG emissions would not exceed those presented in Table 3.14-6.

Long-term operational impacts would also be similar to those described above. While the overall development footprint on Base Seattle would be increased, the replacement of outdated facilities on Base would reduce or partially off-set overall stationary source GHG emissions. Increases in assigned personnel and contract personnel would result in an increase in mobile source GHG emissions associated with vehicle commutes.

Table 3.14-7 Annual Personnel Commuter GHG Emissions

Year	Mileage	Emissions (tons/ year)		GHG SCC 5%		GHG SCC 3%		GHG SCC 2.5%		GHG SCC 95th Percentile	
		CO_2	CH_4	CO_2	CH_4	CO_2	CH_4	CO_2	CH_4	CO_2	CH_4
2022	13,680,000	7,593	0.296	$113,896	$213	$402,432	$473	$599,851	$621	$1,207,296	$1,242
2023	9,900,000	5,495	0.214	$87,920	$160	$296,729	$342	$439,598	$449	$890,186	$920
2024	9,900,000	5,495	0.214	$87,920	$165	$302,224	$364	$450,588	$471	$912,166	$941
2025	12,000,000	6,661	0.259	$113,230	$207	$372,992	$441	$552,828	$571	$1,123,637	$1,167
2026	22,260,000	12,355	0.481	$210,041	$399	$704,256	$866	$1,037,851	$1,107	$2,137,478	$2,261
2027	25,260,000	14,021	0.546	$252,369	$469	$827,210	$983	$1,205,764	$1,256	$2,467,609	$2,620
2028	27,060,000	15,020	0.585	$270,353	$515	$901,176	$1,111	$1,306,705	$1,404	$2,703,527	$2,866
2029	27,060,000	15,020	0.585	$285,372	$532	$916,195	$1,111	$1,321,724	$1,462	$2,748,586	$2,983
2030	25,860,000	14,354	0.559	$2272,717	$525	$889,919	$1,118	$1,277,465	$1,397	$2,684,111	$2,906
2031	30,060,000	16,685	0.650	$484,857	$630	$1,051,138	$1,299	$1,518,311	$1,689	$3,186,785	$3,443
2032	31,260,000	17,351	0.676	$364,367	$676	$1,110,451	$1,419	$1,596,273	$1,757	$3,366,054	$3,581
2033	31,260,000	17,351	0.676	$364,367	$676	$1,127,802	$1,419	$1,630,975	$1,824	$3,435,457	$3,581
	Total	**147,398,492**	**5.739**	**$2,906,408**	**$5,168**	**$8,902,523**	**$10,946**	**$12,937,931**	**$14,006**	**$26,864,891**	**$28,781**
				TOTAL	**$2,911,576**		**$8,913,468**		**$12,951,937**		**$26,893,672**

Note: See Appendix J for mileage assumptions, emissions factors, and relevant references.

Table 3.14-8 TotalGHG Emissions including Construction and Operations at Base Seattle

Social Cost of Carbon Total				
Year	**SCC 5%**	**SCC 3%**	**SCC 2.5%**	**95th Percentile**
2022	$142,860	$504,372	$751,678	$1,512,859
2023	$118,746	$400,448	$593,163	$1,201,172
2024	$129,246	$438,050	$608,009	$1,339,638
2025	$180,636	$588,570	$712,259	$1,794,259
2026	$251,988	$837,889	$1,199,741	$2,562,015
2027	$302,229	$961,676	$1,371,625	$2,952,580
2028	$376,328	$1,219,066	$1,474,637	$3,760,162
2029	$373,927	$1,181,981	$1,491,639	$3,598,679
2030	$350,358	$1,129,303	$1,449,225	$3,445,288
2031	$547,442	$1,188,280	$1,694,197	$3,604,712
2032	$405,294	$1,234,417	$1,774,137	$3,740,968
2033	$405,294	$1,253,678	$1,812,740	$3,818,336
Total	**$3,584,348**	**$10,937,729**	**$14,933,050**	**$33,330,670**

Note: See Appendix J for assumptions, emissions factors, and relevant references.

When compared to GHG emissions in the U.S. (5,981 MMT of CO_2e in 2020), State of Washington (99.57 MMTMMT CO_2e in 2018), and King County (1.0 MMT of CO_2e in 2018) GHG emissions would be negligible. Pursuant to NEPA, Alternative 1 would have no significant impacts on GHG emissions or climate change.

3.14.4.3 Alternative 2 – Modernization with Additional Land from Terminals 30 and 46

The implementation of Alternative 2 would result in Coast Guard acquisition of one berth at Terminal 46 and a portion of Terminal 30, resulting in the displacement of Port functions and emissions associated with these functions. These changes in GHG emissions would be similar to that described for Alternative 1. The additional relocation of functions at the MITAGS property under Alternative 2 would likely also be within the Port, or to a nearby site, but would likely remain within the airshed.

Short-term adverse impacts on stationary and mobile source GHG emissions would be similar to those described above for the Proposed Action. While Alternative 2 would include the development of two new berths at Piers 35E/F, work would include typical construction for waterfront facilities. As described in Section 2.4, *Proposed Action*, the extent of a CERCLA action that would have to occur prior to any pier construction is not currently known. Nevertheless, the construction-related GHG emissions described for the Proposed Action are based on conservative construction-related vehicle assumptions, heavy construction equipment usage, and maximum areas of disturbance during construction. Specific construction activities under Alternative 2 would fit within these assumptions and therefore, GHG emissions would not exceed those presented in Table 3.14-6.

Long-term operational impacts would also be similar to those described above for the Proposed Action. While the overall development footprint on Base Seattle would be increased, the replacement of outdated facilities at the Base would reduce or partially off-set overall stationary source GHG emissions. Increases in assigned personnel and contract personnel would result in an increase in mobile source GHG emissions associated with vehicle commutes.

When compared to GHG emissions in the U.S. (5,981 MMT of CO_2e in 2020), State of Washington (99.57 million metric CO_2e in 2018), and King County (1.0 MMT of CO_2e in 2018) GHG emissions would be

negligible. Pursuant to NEPA, Alternative 2 would have no significant impacts on GHG emissions or climate change.

3.14.4.4 Alternative 3 – Modernization with Additional Land and One Berth at Terminal 46

The implementation of Alternative 3 would result in the acquisition of a portion of Terminal 46, as well as the MITAGS property, and the displacement of these functions and emissions associated with these functions. These changes in GHG emissions would be similar to that described for Alternative 1.

Short-term adverse impacts on stationary and mobile source GHG emissions would be similar to those described for Alternatives 1 and 2. Alternative 3 would include the development of one new berth at Pier 35. As described for Alternative 2, development of this berth would include typical construction for waterfront facilities. The extent of a CERCLA action that would likely occur prior to any pier construction is not currently known. The construction-related emissions described for the Proposed Action are based on conservative construction-related vehicle assumptions, heavy construction equipment usage, and maximum areas of disturbance during construction. Specific construction activities under Alternative 2 would fit within these assumptions and therefore, GHG emissions would not exceed those presented in Table 3.14-6.

Long-term operational impacts would also be similar to those described for Alternatives 1 and 2. While the overall development footprint on Base Seattle would be increased, the replacement of outdated facilities on the Base would reduce or partially off-set overall stationary source emissions. Increases in assigned personnel and contract personnel would result in an increase in mobile source GHG emissions associated with vehicle commutes.

When compared to GHG emissions in the U.S. (5,981 MMT of CO_2e in 2020)**,** State of Washington (99.57 million metric CO_2e in 2018), and King County (1.0 MMT of CO_2e in 2018) GHG emissions would be negligible. Pursuant to NEPA, Alternative 3 would have no significant impacts on GHG emissions or climate change.

3.14.5 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, there would be no changes related to land acquisition, construction, demolition, renovation, or long-term operations at Base Seattle. As such, there would be no changes in existing GHG emissions at the Port of Seattle related to the displacement of functions on Terminal 46, Terminal 30, or any of the other proposed acquisition properties. No temporary construction-related GHG emissions associated with Base Seattle modernization would occur. Existing facilities and infrastructure would continue to have emissions and remain unimproved from current conditions. No upgrades to enable energy efficiency or reduce GHG emissions would be implemented at Base Seattle, resulting in a missed opportunity to implement sustainability measures and minor, adverse impact. Vehicle trips would remain the same with no change in emissions. It is expected that reductions in GHG emissions would continue at the Port following the trend in GHG emissions reductions from 2005 to 2016.

3.14.6 Comparison of Alternatives

All of the action alternatives would result in minor increases in GHG emissions. This increase in GHG emissions would be negligible in comparison to regional GHG emissions and would not measurably effect on climate change. Under the No-Action Alternative, existing facilities and infrastructure would remain unimproved from current conditions. No upgrades to enable energy efficiency or reduce emissions would be implemented, resulting in a missed opportunity to implement sustainability

measures. Pursuant to NEPA, the Proposed Action would have no significant impacts on GHG emissions or climate change.

Table 3.14-9 Comparison of Alternatives for GHGs and Climate Change

Comparison of Alternatives for GHGs and Climate Change Impacts	
Alternative 1	No significant impacts.
Alternative 2	No significant impacts.
Alternative 3	No significant impacts.
No-Action Alternative	No significant impacts.

3.14.7 Environmental Conservation Measures

Each of the alternatives would include the implementation of ECMs. Although no significant impacts to GHG emissions and climate change have been identified, some of these measures are standard construction measures (e.g., addressing issues regarding climate change and sea level rise, limiting the use of hydrofluorocarbons, incorporation of sustainability features into project design, adhering to emissions limits for engines) and their implementation would serve to avoid or further minimize any adverse temporary or operational impacts. These ECMs would apply to all of the action alternatives. See Appendix E for further details regarding these measures including how they would be implemented.

4 Cumulative Effects

Summary of Findings

The Proposed Action and its Action Alternatives, when considered with cumulative impacts would result in potentially significant impacts. Notably, the implementation of the southerly alternatives (Alternatives 2 and 3) would result in a greater impact. If the Coast Guard would choose these alternatives, a CERCLA action would most likely be required to facilitate the expansion of Base Seattle. The scopescope of the CERCLA actions are highly unknown but could include removal of contaminated sediments and site stability measures (e.g. bulkheads, wharf, quaywalls, etc.). While the two project types are related and depend upon each other, they are analyzed under two different regulatory authorities. Additionally, the EPA is the lead agency for any CERCLA action because Harbor Island is part of the National Priorities List. The Coast Guard would be the lead agency for any future supplemental NEPA analysis.

To better inform the public, the Cumulative Impact analysis contemplates the ultimate end state that could occur under the alternatives. This is because the final end state would represent a large change from the current topography, depth, and land use of the proposed land acquisition parcels. Due to this, under Alternatives 2 and 3 the impacts will cause a potentially significant cumulative impact that would be of greater scale and magnitude than any cumulative impact under Alternative 1.

This chapter discusses the potential for cumulative impacts caused by the Proposed Action when combined with other past, present, and reasonably foreseeable actions. Cumulative actions may occur when there is a relationship between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in proximity to a proposed action can reasonably be expected to have more potential for cumulative impacts on shared resources than actions that may be geographically separated. Similarly, actions that coincide in the same timeframe tend to offer a higher potential for cumulative impacts.

4.1 Background

CEQ's NEPA implementing regulations, as amended on May 20, 2022, define cumulative effects as "…effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR §1508.1[g][3]).

4.2 Approach to Analysis

The analyses presented in this section place the direct and indirect impacts of the alternatives for the proposed expansion and modernization of Base Seattle into a broader context that considers the full range of impacts resulting from relevant past, present, and reasonably foreseeable future actions. Overlapping actions, even minor ones, may produce significant impacts over time through additive or interactive (synergistic) processes. For example, an individual street maintenance project may not disrupt vehicle traffic. Multiple street maintenance projects located near one another may however alter traffic flows and create substantial delays. The goal of the cumulative effects assessment is to identify any such combined or cumulative impacts early in the planning process to improve decisions and move toward more sustainable development (CEQ 1997).

Cumulative actions identified in this analysis are limited to those that have the potential for impacts that overlap spatially and in time with those described for the proposed expansion and modernization of Base Seattle. To ensure that the analysis focuses on relevant projects and potentially significant impacts, the cumulative effects analysis presented in Section 4.4, *Cumulative Effects Analysis*, incorporates the following basic guidelines:

- The cumulative impact analysis considers each of the individual resource areas presented in Chapter 3.
- The description of impacts for each resource area provided in Chapter 3 forms the basis for evaluating the contribution those impacts to potential cumulative impacts.
- Cumulative impacts are presented for each of the individual action alternatives, when necessary, to differentiate between the analyses.
- Potential cumulative impacts are derived from reviewing potential impacts associated with past, present, and reasonably foreseeable future actions.
- The spatial and temporal boundaries for past, present, and reasonably foreseeable future actions are defined for each resource area based on the potential for these actions to result in impacts that overlap with those described for each of the action alternatives.
- Public documents, project lists, or other data prepared or provided by federal, state, and local government agencies were the primary sources of information regarding reasonably foreseeable actions.

4.3 Scope of Cumulative Effects Analysis

4.3.1 Spatial Boundaries

The spatial boundaries (i.e., regions of interest) for this cumulative effects analysis encompass the geographic areas of affected resources and the distances at which impacts associated with past, present, and reasonably foreseeable future actions may occur. The geographic scope of the cumulative effects analysis varies depending on the specific resource being evaluated. For example, assessment of the physical environment may be limited to the Base Seattle and Port of Seattle's Terminal 46 and Terminal 30, while air quality may be assessed within the context of the entire air basin. The following spatial boundaries are used for each resource area:

- Land Use – Base Seattle, Port of Seattle Terminals 46 and 30, and surrounding lands where the type of land use changes are proposed in a cumulative project that overlap with land use changes proposed as part of the Coast Guard Action
- Geological Resources – Base Seattle and Port of Seattle Terminals 46 and 30
- Water Resources – Base Seattle, Port of Seattle Terminals 46 and 30, and adjacent portions of Elliott Bay and the East Waterway of the Lower Duwamish River
- Transportation – Regional and Base Seattle transportation network
- Air Quality – The Salish Sea Airshed (Georgia Basin/Puget Sound)
- Biological Resources – Base Seattle, Port of Seattle Terminals 46 and 30, and surrounding areas, particularly nearshore areas within Elliott Bay
- Socioeconomics and Environmental Justice – Socioeconomics within the Seattle Metropolitan Statistical Area and Environmental Justice focused on Census Block 93 Block Group 2 within the City of Seattle

- Cultural Resources – Base Seattle and Port of Seattle Terminals 46 and 30, including in-water areas inclusive of the U&A fishing grounds of the Muckleshoot and Suquamish tribes
- Noise – Base Seattle, Port of Seattle Terminals 46 and 30, and surrounding lands
- Utilities and Public Services – Base Seattle, Port of Seattle, and the surrounding land
- Hazardous Materials and Wastes – Base Seattle and surrounding area where contamination, hazardous materials, or hazardous waste use or occurrences are known
- Visual Resources – Base Seattle, Port of Seattle Terminals 46 and 30, and surrounding viewshed along the industrial waterfront of Elliott Bay
- Recreation – Base Seattle and surrounding area within in the City of Seattle

4.3.2 Temporal Boundaries

The temporal boundaries for this cumulative analysis are defined by the past, present, and reasonably foreseeable future. Past actions are those projects and programs that have previously occurred within the spatial boundaries defined above that would contribute to significant environmental effects when considered alongside the effects of the Proposed Action, or alternatives. The timeframe for present actions includes programs and projects that are currently taking place or being constructed. The reasonably foreseeable time frame for future actions evaluated in this analysis is 25 years from the time Base Seattle's redevelopment is expected to begin (2024). This time frame represents a typical implementation period for components of all alternatives for operation of the redeveloped Base Seattle (i.e., land acquisition, construction, and operations). The exact redevelopment timeline may shift with implementation, and subsequent impact assessment may be conducted as more information is received. Given the lengthy nature of the program, it is anticipated that future projects will be developed over the lifetime of the program that are currently unknown or in such early stages of development that they cannot be considered reasonably foreseeable and are not considered here.

4.4 Past, Present, and Reasonably Foreseeable Future Actions

In order to select the appropriate projects and programs to include in the cumulative effects analysis, the Coast Guard determined whether the resource areas affected by the proposed expansion and modernization of Base Seattle (refer to Chapter 3) would also be affected by other projects or programs being considered within the spatial and temporal boundaries described above. If no such potential relationship existed, the Coast Guard did not carry the project or program forward into the cumulative effects analysis. In accordance with CEQ cumulative impact analysis guidance (CEQ 2005), projects or programs included in this cumulative effects analysis are listed in Table 4-1. The exact timing of the development for all the projects in Table 4-1 is not yet known. A number of these projects may however be implemented concurrently with any of the alternatives.

- Past Projects include projects where the impacts have been incurred and they are not reflected in the baseline data included within each resource area;
- Present Projects include projects where the impacts are still occurring; and
- Reasonably Foreseeable Projects are projects sufficiently likely to occur.

Multiple federal (e.g., USACE, U.S. Navy, Coast Guard, USEPA), state (e.g., Department of Ecology), and local (e.g., Port of Seattle, City of Seattle) databases and websites were used to identify relevant past, present, and reasonably foreseeable future projects.

4.4.1 Cumulative Coast Guard Actions

4.4.1.1 Cutter Homeporting and Acquistions Programs

As described in Section 1.2.1, *Coast Guard Major Cutter Acquisition Programs*, the Coast Guard is currently engaged in several multi-year investment strategies to modernize its operational assets and provide the necessary shore-side infrastructure to operate and support these assets. These strategies include the acquisition of PSCs, expected to be homeported at Base Seattle, and other major cutters whose homeport locations have not yet been determined but could include Base Seattle. The Coast Guard has prepared two PEISs and is preparing a third to evaluate the potential environmental impacts from the proposed acquisition and operation of these new vessels. As described in Section 1.2, these documents analyzed the environmental impacts of the Coast Guard operating these vessels in the polar environment (PSC Acquisition Program Final PEIS) and Pacific Ocean (Final PEIS for the Integrated Deepwater System Project, PSC Acquisition Program Final PEIS, and PEIS/Overseas EIS for the Offshore Patrol Cutter Program's Stage 2 Acquisition). Unlike the Proposed Action considered in this PEIS, the NEPA compliance assessments of these independent Coast Guard actions focus on the delivery, training, operations, and maintenance of the respective vessels rather than the shore-side infrastructure improvements and personnel increases to support these operations including at Base Seattle. This PEIS considers potential increases of personnel at Base Seattle over time. The anticipated environmental impacts from these independent actions are expected to occur in the Pacific Ocean and polar regions, all of which are beyond the spatial boundaries defined above for cumulative resources analysis and are not considered further in this cumulative effects analysis. The potential homeporting of cutters at Base Seattle are included in the analysis as a cumulative project.

4.4.1.2 Temporary Lease at Terminal 46

The Coast Guard has entered into a lease with the Port of Seattle at Terminal 46. The lease was created to allow continued Coast Guard operations during the removal of contaminated sediments at Slip 36. The lease is temporary in nature and any temporary facilities, equipment, or utilities will be removed at the completion of the lease. This lease would result in shared impacts to land use and socioeconmics.

4.4.2 Other Cumulative Actions

The projects included in the analysis in this document is different depending onon which Alternative is being analyzed. These differences are mainly associated with thethe different CERCLA projects with the different land acquisition strategies. Under Alternative 1, the Coast Guard would not be required to deepen or create any new berthing. The berthings would come from existing infrastructure. Under Alternatives 2 and 3 there would be the need to create new berthings. New berthings would need to be deep enough to handle incoming vessels and set far enough away from the navigation channel to prevent obstruction. To ensure that the water depth is deep enough, sediment removal would be required. To ensure that the vessels do not obstruct the navigation channel, removal of shoreline land mass would be required. Because the work would be done within an existing Superfund site, the removal of contaminated sediments would be the first action to occur under CERCLA. The horizontal and lateral extent of the contamination is not fully known at this time. Therefore, if Alternative 2 or 3 are selected, it is reasonably foreseeable that there would be a greater CERCLA action. The extent and magnitude of the CERCLA action is however unknown. While there is a great amount of unknown, this analysis considers the unique and related nature of the CERCLA action to the alternatives.

4.4.2.1 Transportation and Pedestrian Projects

There are several transportation and pedestrian projects that would contribute to impacts in the area. The goal of all transportation projects listed is to improve the efficiency and safety of the transportation network. In general, the impacts attributable to these projects would mainly be confined to beneficial transportation impacts, minor air emissions, and short-term increases in noise due to construction.

4.4.2.2 In-Water Improvements

In-water improvements, such as pier removal, piling replacement, decking installation, habitat restoration, and dredging and disposal of sediments would generally affect the in-water habitats. In most cases there would be shared impacts to biological resources, water quality, and geology. In some cases there would be shared impacts during construction such as traffic, air quality emissions, noise, and soil erosion.

4.4.2.3 CERCLA Projects

As described in Section 1.2.2, *Comprehensive Environmental Response, Compensation, and Liabilities Act Action at Base Seattle*, the Coast Guard is conducting NTCRA at Slip 36 under an ASAOC with USEPA requiring the Coast Guard to conduct EE/CA to determine what, if any, action is appropriate to address contamination at Slip 36 under CERCLA. This action, while not within the scope of the Proposed Action considered in this PEIS, is considered a cumulative action alongside the Proposed Action and its alternatives here.

Beyond the future CERCLA activities at Slip 36, the Proposed Action and its alternatives may include in-water work at various locations that may disturb bottom sediments either within or adjacent to the administrative boundary of HISS OU 10 (See Section 2.4, *Proposed Action*):

- All Action Alternatives – While the details of future work and the extent of contamination in this area are not currently known, it is assumed for purposes of this cumulative analysis that rehabilitation of the wharf area at the southern end of Terminal 46 may be conducted under a separate CERCLA action.
- Alternative 1 – It is assumed that there would be ongoing CERCLA removal actions within the vicinity of Base Seattle. These actions would be overseen by USEPA. While the outcome of the CERCLA projects that could occur under Alternative 1 for HISS OU 10 is unknown, it is likely that if Alternative 2 or Alternative 3 are chosen that there would be much greater impacts than what would occur under Alternative 1. For example, USEPA could choose to remove less sediment but establish a cap that protects any remaining contamination in place. The cap would allow the removal action to permanently remove less habitat when looked at against Alternatives 2 and 3.
- Alternative 2 – The Coast Guard is not currently proposing to undertake a CERCLA removal action at proposed Piers 35E/F within HISS OU 10. Design elements of Piers 35E/F are not known at this time, but would potentially include the construction of two new berths, one on existing Coast Guard property and one on an acquired portion of Terminal 30 (totaling over 1,110 LF). These berths would be supported by piles and decking and may require dredging or fill to support or stabilize land beneath the structures. Additionally, there may be the removal of land mass to ensure that berthing does not obstruct the navigation channel. This removal of land mass would result in a change to the shoreline. There would most likely be a significant amount of removal of sediments that would result in the loss of existing shellfish beds. This potential disturbance of bottom sediments may trigger a separate CERCLA action that would potentially follow the CERCLA pathway for actions described in Section 2.4.

- Alternative 3 – The Coast Guard is not currently proposing to undertake a CERCLA removal action at proposed Pier 35E within HISS OU 10. Similar to Alternative 2, design elements of Pier 35E are not known at this time but would potentially include the construction of one new berth on existing Coast Guard property (totaling over 560 LF). This berth would be supported by piles and decking and may require dredging or fill to support or stabilize land beneath the structures. Additionally, there may be the removal of land mass to ensure that berthing does not obstruct the navigation channel. This removal of land mass would result in a change to the shoreline. There would most likely be a significant amount of removal of sediments that would result in the loss of existing shellfish beds. This potential disturbance of bottom sediments may trigger a separate CERCLA action that would potentially follow the CERCLA pathway for actions described in Section 2.4.

If separate CERCLA actions are determined to be triggered by in-water work under any of the alternatives, they would have a causal relationship with the Proposed Action (i.e., they would not occur without the Proposed Action). The CERCLA actions would occur within the spatial and temporal boundaries defined above for water resources, biological resources, and hazardous materials and wastes, and are considered in the cumulative effects analyses.

Table 4.4-1 Projects Included in the Cumulative Effects Analysis

Proponent	Location	Activity Name	Description	Timeframe	Alternative	Shared Affected Resources
WSDOT	Highway 99	Alaskan Way Viaduct Replacement Program (South End)	Remove and replace aging State Route 99 (Alaskan Way Viaduct)	Past	All	• Transportation • Noise • Air Quality
WSDOT	Marginal Way	East Marginal Way Corridor Improvement Project	Reconstruct East Marginal Way between South Atlanta Street (adjacent to Base Seattle) south to Spokane Street	Present	All	• Transportation • Noise • Air Quality
WSDOT / City of Seattle	General Area	Various maintenance activities	Intermittent resurfacing and other maintenance activities for existing road network including resurfacing	Present	All	• Transportation • Noise • Air Quality
City of Seattle	Elliott Bay Waterfront	Waterfront Seattle Alaskan Way	Reconstruction of Alaskan Way between King and Pike Streets and construction of new street, Elliott Way, between Pike and Bell Street to increase transit connections, pedestrian safety, and vehicle queueing at Colman Ferry Dock	Present	All	• Transportation • Noise • Air Quality
		Waterfront Seattle Railroad Way	Convert portion of Railroad Way to pedestrian-oriented plaza linking the Elliott Bay Waterfront to Stadium District	Present	All	• Transportation • Visual Resources • Recreation
		Waterfront Seattle Elliott Bay Park Promenade and Bike Path	New linear waterfront park extending from Pioneer Square to the Seattle Aquarium as well as improving access to Colman Ferry Dock	Present	All	• Transportation • Visual Resources • Recreation
		Waterfront Seattle Multimodal Terminal at Colman Ferry Dock	Replace aged and seismically vulnerable Colman Ferry Dock	Present	All	• Transportation • Noise • Air Quality
USCG	Terminal 46	Short-term lease of Terminal 46	USCG has leased a 26-acre portion of Terminal 46 for 1 year starting in July 2022 with 4 successive 1-year renewal option periods. The lease of Terminal 46 accommodates the relocation of Coast Guard cutters and Base Seattle functions/personnel during the theplanned CERCLA action at Slip 36	Present	All	• Land Use

Proponent	Location	Activity Name	Description	Timeframe	Alternative	Shared Affected Resources
Port of Seattle	Terminal 30	Central Substation Update	Replacement of the Terminal 30 Central Substation to address damaged equipment and accommodate future shore power infrastructure at Terminal 30 Port Environmental Determination: No probable significant impacts on the environment	Present	Alternative 2 Alternative 3	• Utilities & Public Services
Port of Seattle	Terminal 46	Ongoing Layberth Usage at Terminal 46	Ongoing use of Terminal 46 as temporary layberth (tie-up) with no cargo on/off-loading activities Port Environmental Determination: No assessment conducted	Present	All	• Transportation • Noise • Air Quality
Port of Seattle	Terminal 5	Terminal 5 Modernization Project	Redevelopment of Terminal 5 infrastructure to accommodate largest container ships including reconstruction of docks, addition of larger cargo cranes, installation of upgraded electrical supply to power larger cranes, provide shoreside power, and increase refrigerated container capacity Port Environmental Determination: SEPA/NEPA EIS conducted	Present	All	• Water Resources • Transportation • Biological Resources • Socioeconomics & Environmental Justice • Noise • Utilities & Public Services
Port of Seattle	Duwamish River	Duwamish River People's Park	Convert 14 acres of degraded industrial shoreline (former Terminal 117) habitat for salmon and other fish and wildlife, indirectly including Southern Resident Killer Whale (via increased prey availability). Project components include public access features, boat ramp, and "hands-on" habitat area. Indirect impacts on "green economy" by creating a "habitat credit bank" for habitat restoration Port Environmental Determination: To occur in future	Present	All	• Water Resources • Biological Resources • Cultural Resources • Visual Resources • Recreation

Proponent	Location	Activity Name	Description	Timeframe	Alternative	Shared Affected Resources
Port of Seattle	Pier 66	Shoreside Power Project	Installation of an underwater power cable to Terminal 66 from Terminal 46 and off-site 26 kV service from City Light and associated infrastructure Port Environmental Determination: Non-significant (SEPA)	Reasonably Foreseeable Future	All	• Water Resources • Biological Resources • Utilities & Public Services
Port of Seattle	Terminal 46	North Pier Structure	Major repair/replacement project at the Terminal 46 North Berth to include reconstruction of timber apron, slope stabilization, low freeboard fenders and bollards, utilities Port Environmental Determination: To occur in future	Reasonably Foreseeable Future	All	• Geological Resources • Water Resources • Biological Resources • Air Quality • Visual Resources
Port of Seattle	Terminal 91	Berths 6 and 8	Proposed redevelopment of Berths 6 and 8 (including pile replacement, new wharf, new float system, bulkhead improvements/ stabilization) and reconstructing approximately 800 feet of moorage for the North Pacific Fishing Fleet Port Environmental Determination: To occur in future	Reasonably Foreseeable Future	All	• Water Resources • Biological Resources • Air Quality • Visual Resources
Port of Seattle	Ship Supply Building	Maritime Innovation Center	Restoration and modernization of historic Port's Ship Supply Building to support workforce development and maritime career explorations through training and business incubation and acceleration Port Environmental Determination: To occur in future	Reasonably Foreseeable Future	All	• Socioeconomics and Environmental Justice
Port of Seattle	Terminal 91	Upland Development	Development within 10- to 15-year planning horizon of light industrial building space to support maritime manufacturing and fishing industry suppliers	Reasonably Foreseeable Future	All	• Socioeconomics and Environmental Justice • Air Quality • Visual Resources

Proponent	Location	Activity Name	Description	Timeframe	Alternative	Shared Affected Resources
			Port Environmental Determination: To occur in future			
USEPA	Lower Duwamish Waterway	Lower Duwamish Waterway Superfund Site Cleanup	Clean-up of contaminated sediments, largely from many urban sources, ranging from stormwater runoff, wastewater, and industrial practices. Remediation activities include dredging or partial dredging and capping, and ongoing water and sediment testing	Present	All	• Water Resources • Biological Resources • Hazardous Materials & Wastes
USEPA	East Duwamish Waterway	HISS OU 10 Slip 36 CERCLA	Clean-up of contaminated sediments in Slip 36, stabilization of shoreline as contaminated sediments are removed, and replacement of the functional use of the slip for Coast Guard use via the demolition of Pier 36B and Building 3. Existing personnel and uses currently located in Building 3 would be relocated during clean-up activities (see short-term lease from Port to Coast Guard at Terminal 46)	Reasonably Foreseeable Future	All	• Water Resources • Biological Resources • Hazardous Materials & Wastes
USEPA	East Duwamish Waterway	HISS OU 10 Terminal 46 – Area 3	Clean-up of contaminated sediments below or adjacent to Area 3 of Terminal 46. This activity would take place under CERCLA, if determined to be necessary	Reasonably Foreseeable Future	All	• Water Resources • Biological Resources • Hazardous Materials & Wastes
USEPA	East Duwamish Waterway	HISS OU 10 Piers 35E/F	Clean-up of contaminated sediments at the future sites of Pier 35E/F (Alternative 2) or Pier 35E (Alternative 3). This activity would occur under CERCLA prior to Coast Guard conducting any construction activities to construct these facilities including pile slope stabilization. Design details for the construction of Piers 35E/F are unknown at this time and could involve placement of fill. Driving of piles to support a wharf, and/ormodify the shoreline by removal of land mass.	Reasonably Foreseeable Future	Alternative 2 Alternative 3	• Water Resources • Biological Resources • Hazardous Materials & Wastes

Proponent	Location	Activity Name	Description	Timeframe	Alternative	Shared Affected Resources
Coast Guard	Pacific Northwest Arctic Antarctica	Homeporting of New PSCs and other major cutters	Replacement of existing Coast Guard ice breakers homeported at Base Seattle with new, modern vessels	Reasonably Foreseeable Future	All	• Water Resources • Transportation • Air Quality • Biological Resources • Socioeconomics & Environmental Justice
USACE	East/West Duwamish Waterways	Seattle Harbor Navigation Improvement Project	Dredging of the East and West Waterways to deepen the channels to 57 feet below MLLW to facilitate safe passage of vessels along the waterways. Dredged materials would be transported by barge to the Elliott Bay disposal site or open water disposal or to shore for upland disposal of material unsuitable for open water disposal.	Reasonably Foreseeable Future	All	• Water Resources • Transportation • Biological Resources
USACE	Base Seattle	St Martin de Porres Shelter	Base Seattle out-grants space in Building 7 to USACE, which in turn leases the space to Catholic Community Services and is operated as the St. Martin de Porres homeless shelter. There are three potential actions related to the shelter: 1. The lease with USACE is due for renewal in 2023. 2. ShelterS operations would be relocated, either temporarily or permanently, duringduring renovation of Building 7. 3. The shelter would be permanently relocated if Building 7 is demolished since the Coast Guard lacks authority to expend funds to rebuild space for the shelter.	Reasonably Foreseeable Future	All	• Socioeconomics & Environmental Justice • Hazards and Hazardous Materials
USACE and Department of Ecology	Elliott Bay Disposal Site	Elliott Bay In-Water Disposal of Dredged Material	In-water disposal of dredged material at specifically designated site in Elliott Bay approximately 1 mile north of Base Seattle	Present and Reasonably Foreseeable Future	All	• Water Resources • Biological Resources • Hazards and Hazardous Materials

Proponent	Location	Activity Name	Description	Timeframe	Alternative	Shared Affected Resources
City of Seattle	Elliott Bay-Pier 58, Pier 62, Waterfront Park	Pier 58 Re-Construction Project	Replacement of Pier 58, including the removal of the remaining steel H-piles and timber piles, installation of new steel piles, installation of new concrete pier decking and reconfiguration to provide open water habitat, installation of grated surfaces to improve light penetration, and substrate placement for shallow water habitat enhancements at Waterfront Park and between the Aquarium and Pier 62. City Environmental Determination: Non-significant (SEPA)	Present and Reasonably Foreseeable	All	• Water Resources • Biological Resources • Noise • Transportation • Recreational • Noise
City of Seattle	Pier 63	Pier 63 Removal (Remaining work under the SEATTLE Aquarium Ocean Pavilion)	Removal of pier 63 to improve salmon habitat.	Reasonably Foreseeable	All	• Water Resources • Biological Resources • Noise
King County Regional Homeless Authority, Seattle Housing Authority, Renton Housing, City of Seattle, United Way of Seattle	King County/Seattle	Miscellaneous Projects to Reduce Homelessness	Projects are designed to minimize the amount of homelessness and ensure shelter space including enactment of a voucher system that provides housing to 786 families.	Present and Reasonably Foreseeable	All	• Socioeconomics and Environmental Justice

4.5 Cumulative Effects Analysis

4.5.1 Land Use

Cumulative Land Use changes that would occur due to cumulative projects would be isolated to the loss of cargo/container terminal space. The short term lease of 26 acres removes 26 acres of cargo terminal space from use during the CERCLA cleanup. This project would have differing impacts under each alternative.

4.5.1.1 Alternative 1

Under Alternative 1, the Coast Guard would acquire between 27-53 acres of Terminal 46. These acres would overlap with the area under short-term lease by the Coast Guard. As such, there would be no additional cumulative effects to land use. The impacts to land use under Alternative 1 would however remain significant.

4.5.1.2 Alternative 2

Under Alternative 2, the Coast Guard proposes to acquire approximately 30 acres of property at Terminal 30. About 1.1 acres of this property is Jack Perry Memorial Park. Under this alternative, 28.9 acres of cargo/container terminal space would be acquired by the Coast Guard. If the land acquisition would occur at the same time as the short-term lease, this would result in a temporary loss of up to 54.9 acres of terminal space. This would also remove half of the berths from operation at Terminal 30. Three berths would be lost overall during the short-term lease. The relatively short duration of time that this overlap would occur would minimize the impacts to cargo operations to the maximum extent practicable; however, during the temporary loss there would be additional adverse impacts to land use. Therefore, there would be a greater significant impact due to the overlapping land use changes under Alternative 2.

4.5.1.3 Alternative 3

The impacts under Alternative 3 would be the same as Alternative 1 due to the overlapping footprints of the short term lease and the long-term acquisition. Therefore under Alternative 3 there would be no additional cumulative effects to land use and the impact would still be significant.

4.5.1.4 No Action Alternative

There would be no change of land use under the No-Action Alternative. As such, there would be no impact to land use.

4.5.2 Geological Resources

Based on the impact assessment presented in Chapter 3, the area relevant for a discussion of cumulative impacts on geological resources includes Base Seattle and the Port of Seattle's Terminal 46 and Terminal 30. The proposed expansion and modernization of Base Seattle, including demolition and reconstruction of various existing structures, would generally increase the Base's resilience in the face of geological hazards resulting from the physical environment. In the context of reasonably foreseeable future actions at Base Seattle and the immediate surrounding vicinity, the various action alternatives would not make a cumulatively considerable contribution to significant impacts related to geological resources and hazards resulting from the physical environment (i.e., increased susceptibility to tsunamis or increased

potential for earthquakes to occur). All alternatives, except the No-Action Alternative, would improve Base Seattle's resilience in the face of ground shaking and tsunami inundation (earthquakes).

4.5.2.1 Alternative 1

Implementation of activities associated with the identified Slip 36 CERCLA actions at Base Seattle would result in beneficial cumulative effects. In addition to seismic deficiencies of upland structures at Base Seattle, existing bulkheads securing the waterfront are susceptible to lateral spreading or liquefaction of the shoreline sediment during strong shaking events caused by earthquakes. Proposed CERCLA action would potentially result in the repair and/or relocation of the slip's structural bulkhead to better protect against liquefaction or lateral spreading resulting from earthquakes shaking unstable soils underlying the Base. Rehabilitation of in- and over-water structures that would occur under the expected CERCLA action would also include necessary seismic upgrades to support decking and to stabilize immediate upland locations. These improvements would provide greater stability and resistance to ground shaking and liquefaction in the area immediately surrounding these components of Base Seattle. Therefore, these foreseeable CERCLA action would result in enhanced seismic safety and stability.

The proposed CERCLA action at Slip 36 would also result in a beneficial impact on the resiliency of the project area shoreside and upland structures in response to potential tsunami or seiche waves that could potentially flood the area following an earthquake. The reconstruction of the piers and structures surrounding the boat basin and remaining waterfront would not move these structures outside or above the mapped tsunami inundation zone, but would update these aged, deteriorated structures to comply with modern seismic codes. Therefore, while tsunami and/or seiche waves may occur in the future, the infrastructure reconstructed as part of the CERCLA actions would be expected to comply with current seismic standards and assist in contributing to the stability of Base Seattle and the immediate surrounding vicinity. The additional CERCLA actions applicable to Alternative 1would not change the the shoreside and upland site stability. Therefore, no significant impacts would be expected.

4.5.2.2 Alternative 2

The cumulative impacts under Alternatives would result in similar beneficial impacts under Alternative 1 due to the removal of contaminated sediments and the stabilization of land on Base Seattle. Alternative 2 would however result in the loss of shoreline to the south of Base Seattle. Any CERCLA action that would remove sediments and/or land mass would be required to ensure site stability prior to completing the work. Any infrastructure that would be constructed to stabilize the shoreline would be expected to comply with current seismic standards and assist in contributing to the stability of an expanded Base Seattle and the immediate surrounding vicinity. Given the loss of shoreline and the unknown extent of impacts, it is not possible to determine the degree of significance under this alternative. Further analysis would be required when more details are available to fully determine the extent of the impacts. Therefore, potentially significant cumulative impacts to geological resources could occur under Alternative 2.

4.5.2.3 Alternative 3

The impacts under Alternative 3 would be similar to Alternative 2, but would be of less intensity as the land that would need re-developed and dredged would be substantially less. There would be less loss of shoreline. Given the loss of shoreline and the unknown extent of impacts, it is not possible to determine the degree of significance under this alternative. Further analysis would be required when more details

are available to fully determine the extent of the impacts. Therefore, potentially significant impacts to geological resources could occur under Alternative 3.

4.5.2.4 No Action Alternative

The No-Action Alternative would not result in any additional impacts that could result in a significant cumulative impact to geological resources.

4.5.3 Water Resources

Cumulative impacts to water resources in the greater Elliott Bay and Puget Sound could result from upland construction and in-water construction activities at Base Seattle and the Port of Seattle. Upland construction occurring near surface waters would potentially increase runoff into surface waters resulting in adverse impacts on water quality. Additionally, upland construction activities may result in inadvertent spills that would adversely impact groundwater quality due to introduction of contaminants into the subsurface. In-water construction activities including dock reconstruction, would both increase the potential for spills directly into waterbodies as well as increase turbidity due to disturbance of bottom sediments, which would result in adverse impacts on water quality that would generally be short-term in nature similar to those impacts assessed under the Proposed Action. In-water construction projects that replace existing, creosote-treated timber piles with untreated timber piles, or other materials, would conversely remove pollutants from surface waters and would be considered a long-term beneficial impact.

Upland construction at individual project sites that drain to Elliott Bay has the potential to have a cumulative effect on water quality related to runoff of disturbed or unstabilized sediments, particularly if these activities occur simultaneously. Upland construction projects expected to occur during construction at Base Seattle and in close enough proximity to Base Seattle where runoff directly into Elliott Bay could potentially mix include improvements to Terminal 30 (Central Substation update); Terminal 46 (repair/replacement of the North Berth); Terminal 5 modernization; redevelopment of Berths 6 and 8, and other upland development at Terminal 91; and future construction of the Duwamish River People's Park. Each of these actions may individually contribute runoff that would adversely impact water quality and, when considered cumulatively, may contribute to exceedances of water quality standards without BMPs. All upland construction projects, including upland construction at Base Seattle, would however comply with relevant laws and regulations requiring implementation of BMPs to control and/or prevent runoff of disturbed, exposed, or stockpiled sediment into any waterbody from an individual construction site. With implementation of these measures at Base Seattle and at other nearby construction sites, no significant cumulative impacts on onshore water quality would be expected.

In-water construction projects expected to occur during proposed construction activities at Base Seattle would include ongoing and future Port of Seattle projects, including modernization of Terminal 5, Pier 66 underwater cable installation, repair and/or replacement of the north pier of Terminal 46, and redevelopment of Berths 6 and 8 at Terminal 91. Ongoing and future in-water construction projects would implement spill control, sediment containment (e.g., sediment curtains), and other BMPs in compliance with relevant laws and regulations. With implementation of these measures at Base Seattle and at other construction sites, the potential for cumulative impacts on water quality would be minimized to the maximum extent practicable.

Beyond in-water construction projects, cumulative water quality impacts are expected to result from ongoing and projected CERCLA actions to address contaminated sediments in the Lower and East Duwamish Waterways.

CERCLA actions in Slip 36 within Base Seattlewould occur under all three action alternatives but as separate actions from the Proposed Action. Additional CERCLA actions would occur separately from, and prior to, implementation of Alternatives 2 at Piers 35E/F and Alternative 3 at Pier 35E. Increased turbidity and contaminant loads are expected in the water while sediment removal and cleanup are occurring. The duration and intensity of adverse water quality impacts would vary based on the duration and expanse of the associated CERCLA actions.

4.5.3.1 Alternative 1

Of the three action alternatives, Alternative 1 would have the smallest potential for cumulative effects when considered alongside the in-water work at Terminal 46. This is because the amount of sediment removal would not be greater than what would eventually occur without the implementation of Alternative 1. Additionally, there would be no increase to the amount of impervious surfaces. While it is anticipated that there would be significant impacts under Alternative 1, the collection of CERCLA actions that would occur across Puget Sound would lead to a beneficial significant impact.

4.5.3.2 Alternatives 2

The implementation of the CERCLA project would most likely differ according to the cleanup requirements. If the Coast Guard does not move south, different remedial designs may be chosen. Due to the Coast Guard's need for a deeper berthing, the extent of disturbance would most likely be greater than what would occur if a CERCLA cleanup is completed without Coast Guard participation. Alternative 2 would have the greatest potential for cumulative impacts on water quality given the lengthlength and depth of the CERCLA actions required to remove or remediate contaminated sediments at Piers 35E/F, which is larger than under the other two action alternatives. As aa CERCLA project is completed, water quality impacts are expected to return to baseline or even better conditions due to the removal of contaminated sediments. Additionally, due to the changes to the shoreline, there would be a greater amount of water surface area. The removal of land mass would temporarily increase sedimentation within the water body. The sediments could temporarily release additional contamination into the water column. There would be potentially significant cumulative adverse impacts under Alternative 2 due to the unknown amount of sediment removal and the unknown amount of land mass loss that would occur for CERCLA actions related to the expansion. Long-term significant beneficial impacts would however occur due to the improvement in water quality across all of Puget Sound.

4.5.3.3 Alternative 3

Alternative 3 would have impacts similar to Alternative 2, but the impacts would be slightly less because the amount of land acquisition that would require significant removal of sediments and land mass would be less. There would also be a lower increase of impervious surfaces. There would be potentially significant cumulative adverse impacts under Alternative 3 due to the unknown amount of sediment removal and the unknown amount of land mass loss that would occur for CERCLA actions related to the expansion. Long-term significant beneficial impacts would however occur due to the improvement in water quality across all of Puget Sound.

4.5.3.4 No Action Alternative

The CERCLA actions that would occur without the implementation of the Proposed Action would lead to long-term beneficial significant impacts due to the improvement in water quality across all of Puget Sound.

4.5.4 Transportation

In general, transportation projects are designed to improve both pedestrian and roadway traffic. These projects would have a long-term beneficial impact. Short-term, intermittent, adverse cumulative impacts on transportation could occur if the construction, demolition, and renovation phase of the proposed Base Seattle modernization program overlapped with construction activities for the reasonably foreseeable projects. These impacts could include additional construction traffic on roadways local to Base Seattle, such as Alaskan Way South, that may be used for daily worker commute trips to and from the area and heavy haul truck trips for material delivery and debris hauling. Impacts could also include increased commute times from potential road closures, lane closures, or detours on roadways used to reach Base Seattle. Any construction activities resulting in lane closures or detours, including detours along construction delivery routes or routes used by construction workers and Base personnel, would increase driving times and distances to reach intended destinations and shift traffic patterns to accommodate construction sites. Construction traffic from the proposed Base Seattle modernization program, when combined with construction from the reasonably foreseeable projects, would increase the number of vehicles transiting on local and regional roadways beyond what is predicted for the proposed Base Seattle modernization program. This combined traffic would be dependent on the type and scale of construction activities in the area and would cease at the completion of such construction activities. In addition, construction activities would be coordinated among agencies and phased to avoid overlapping construction periods, where possible.

Reasonably foreseeable projects that could result in permanent changes to traffic include the Waterfront Seattle Program and Seattle Multimodal Terminal at Colman Dock. These projects could result in increases in pedestrian and bicycle traffic near the Central Seattle Waterfront, Stadium District, and Pioneer Square; and the Pacific Maritime Association Lease, which would introduce additional commuters to the area. The additional commute trips, when combined with the projected operational vehicular traffic from the proposed Base Seattle modernization program, could result in long-term, adverse, cumulative impacts on transportation beyond what is expected from the proposed Base Seattle modernization program. Any additional traffic on South Atlantic Street/Edgar Martinez Drive would result in further exceedance of the roadway's capacity and could cause additional congestion near Base Seattle. Both short- and long-term impacts to traffic resources would vary dependent upon the Alternative chosen.

4.5.4.1 Alternative 1

Alternative 1 would result in only the impacts described above. Increases in temporary construction traffic from the reasonably foreseeable projects and the proposed Base Seattle modernization program could increase the rate of roadway deterioration or reduce accessibility and efficiency of roadway networks, which would result in long-term, cumulative, adverse impacts on transportation. When considered with the beneficial impacts of the transportation projects, there would be no significant impacts to transportation under Alternative 1.

4.5.4.2 Alternative 2

Alternative 2 would result in an additional increase of short-term traffic in the area if, during the implementation of the CERCLA project, trucks are used to haul contaminated soil off-site. The number of trucks used would be commensurate with the removal of land mass and sediment. It is also possible that the CERCLA projects would use a barge to remove the sediments. If a barge is used then there would be no additional impacts to transportation greater than what is described above. If trucks are used to haul away sediment, there would be a greater increase in truck traffic. Any significant impact to transportation would most likely be mitigated by the implementation of a traffic management plan. Therefore, no significant cumulative impacts would be expected to transportation.

4.5.4.3 Alternative 3

Alternative 3 would result in similar impacts as Alternative 2; however, the amount of traffic generated by any CERCLA action would be less. Any significant impact to transportation would most likely be mitigated by the implementation of a traffic management plan. Therefore, no significant cumulative impacts would be expected to transportation.

4.5.4.4 No-Action Alternative

The No-Action would not have a significant impact as the intensity of the localized improvements would not cause significant improvements to the transportation infrastructure in the area. They would however improve flow and circulation.

4.5.5 Air Quality

Under the proposed Base Seattle modernization program, construction-related criteria air pollutant emissions would be generated at specific construction sites where individual buildings, infrastructure, hardscaping, and/or landscaping are demolished, rehabilitated, or constructed. Construction activities associated with the proposed expansion and modernization of Base Seattle would contribute to these criteria pollutant emissions. Expected construction emissions would not differ appreciably between the three action alternatives based on the building footprints and scheduled operations of heavy construction equipment being roughly equal across alternatives. As described in Section 3.5, *Air Quality*, construction-related emissions generated under the action alternatives at Base Seattle would remain well below *de minimis* levels and would not be expected result in a substantial contribution to any cumulatively significant air quality impacts. Individual construction projects, including the proposed expansion and modernization of Base Seattle, would require coordination with the Puget Sound Clean Air Agency. Depending on a project's scale, a Notice of Construction/Order of Approval may be required pursuant to Puget Sound Clean Air Agency Regulation I, Article 6, Section 6.03 (Puget Sound Clean Air Agency 2021). Required compliance with Puget Sound Clean Air Agency Regulations and continued air quality monitoring would ensure compliance with NAAQS.

As described in Chapter 2, *Description of Proposed Action and Alternatives*, the replacement of existing facilities at Base Seattle with new and expanded facilities would support existing and programmed operations, as well as an associated increase in personnel including increased air emissions from commuter trips. Cumulative projects within the Puget Sound Basin would also contribute to operational emissions of criteria air pollutants. New or renovated facilities beyond Base Seattle may require Title V operating permits or PSD permits that would limit criteria air pollutant emissions to a maximum allowable increase. Required compliance with Puget Sound Clean Air Agency Regulations and continued air quality monitoring would ensure compliance with NAAQS. While the proposed expansion and

modernization of Base Seattle would support an increase in building area and personnel (e.g., increased emissions), the Proposed Action under all action alternatives would also replace existing inefficient buildings with new buildings that meet all applicable laws and regulations (decreased emissions), Coast Guard policy (Coast Guard 2014), and Coast Guard guidance (Coast Guard 2020).While Alternatives 2 and 3 could lead to short term increases in the amount of traffic, it would not lead to an exceedance of NAAQSs. Considering this and thee increase in energy efficiency, the implementation of the Proposed Action, when combined with other reasonably foreseeable projects, would have no cumulatively significant impacts on air quality. The No-Action Alternative would result in no change to the air emissions profile in the area beyond *de minimis* values and all projects would operate according to the necessary permitting requirements. Therefore, the No-Action Alternative would have no significant impacts to Air Quality.

4.5.6 Biological Resources

Biological Resources would have varying environmental impacts, dependent upon the alternative that is selected. Elliott Bay and the Duwamish River have been modified extensively to accommodate development in the Seattle region. Nevertheless, nearly all the estuarine shoreline—originally consisting of tidal swamps, tidal marshes, shallows, and flats inclusive of the confluence of the Duwamish River with Elliott Bay—has been altered. Harbor Island and the surrounding area was expanded with fill and developed for industrial use. Overwater structures occupy more than 65 percent of the shoreline within Elliott Bay (Williams et al. 2001).

The projects that may result in cumulative impacts on biological resources, when combined with the proposed Base Seattle modernization program, include the USACE Seattle Harbor Navigation Improvement Project, USEPA Lower Duwamish Waterway Superfund Site Cleanup, Coast Guard Homeporting of New PSCs and other major cutters, Duwamish River People's Park Habitat Restoration and Shoreline Access Project, and Howard Hanson Dam Project. Additionally, any project described in Table 4-1 that includes in-water work or substantial on-shore construction could contribute to water quality impacts (refer to Section 4.4.1.3) that would in turn impact aquatic resources. Activities associated with these projects include increases in suspended sediment, risk of exposing toxic substances, underwater noise, and removal of low trophic level plants and animals from bay bottoms. Cleanup of the lower Duwamish Waterway CERCLA (Superfund) site would increase water quality and benefit aquatic wildlife by removing chemical toxins over the long-term, resulting in an overall net benefit. Similarly, the People's Park Habitat Restoration Project and Pier 63 would restore habitat and create fish passage that would benefit salmonids, bull trout, and other fish species. This would also result in a net beneficial impact.

USACE performs operations and maintenance activities on the lower Duwamish River navigation channel annually. The latest dredge design plans included removal of 65,000 cubic yards from the Duwamish River and subsequently placing it in Elliott Bay (USACE 2020). This maintenance dredging results in routine scouring of the river channel and can result in multiple adverse impacts on the local aquatic environment. Primarily, dredging the riverbed increases the amount of suspended sediment, some of which may contain high concentrations of toxic chemicals. Dredging can also create underwater noise and remove low trophic level plants and animals that are vital for other species survival (e.g., food, hiding from predators), resulting in short-term, moderate, adverse impacts.

The upland and in-water modifications required for the existing industrial areas for the Proposed Action would incur impacts that are not likely to be significant on their own. When considered cumulatively

with regional USACE dredging projects, the in-water work at Area 3 may add to turbidity plumes, underwater noise, and exposure to hazardous chemicals in suspended sediments. The additive stressors would be short-term and are not likely to result in a measurable difference. In the long term, upgrading Base Seattle's stormwater utilities may lead to improved water quality within the lower Duwamish River and Elliott Bay. This improvement, although likely to be minor, may provide beneficial impacts on the overall estuarine environment when considered in combination with upstream restoration projects designed to enhance riparian habitat and the CERCLA hazardous chemical cleanup project. The amount of permanent habitat improvement and temporary loss that that would be associated with CERCLA actions is not able to be quantified at this time.

4.5.6.1 Alternative 1

The impacts under Alternative 1 would be as detailed above. Under Alternative 1 the project's impacts would not be significant. The CERCLA projects that would occur across Puget Sound would also provide a cumulatively beneficial Significant Impact to the Water Quality and therefore the habitat in Puget Sound.

4.5.6.2 Alternative 2

The proposed construction and CERCLA action atat Pier 35 (E) and (F) couldcould result in the dredging of deep basins, removal of land mass, and the construction of a wharf, quaywall, or other structure to stabilize sediments. This would occur in areas that currently contain open water, vegetated shorelines, or smaller pier structures. The CERCLA project would remove creosote and contaminated pilings and sediments. This would improve the water quality over the long-term. The primary impact from implementation of the project would be the permanent loss and conversion of aquatic habitat designated as EFH and critical habitat, which are protected under the MSA and ESA. This area leads to the Duwamish River, which used by salmon moving into and out of spawning rivers south of Seattle. While the area does not have an abundance of shoreside vegetation and shallow habitat that provides food and cover for salmon, the possible changes to the depth and width of the area could further degrade the salmon nearshore habitat. The configuration of these piers has not been finalized. Therefore, the amount of critical habitat loss is unknown. The cumulative impact would be long-term and potentially significant when combined with the extensive habitat modifications historically incurred along the Duwamish River and Elliott Bay estuary to accommodate development even when considering the habitat restoration sites identified in Table 4.4-1. There would also be removal of nearshore habitat that could affect listed species and shellfish beds. The permanent loss of habitat that could affect listed species such as salmon represents a potentially significant impact to biological resources under Alternatives 2.

4.5.6.3 Alternative 3

Alternative 3 would result in similar impacts as Alternative 2, but of less magnitude due to the smaller amount of cleanup and land mass removal that would occur. Therefore there would be a potentially significant cumulative impact to biological resources under Alternative 3.

4.5.6.4 No-Action Alternative

Under the No-Action Alternative there would be CERCLA action that would occur in Puget Sound. These CERCLA Actions would result in a cumulatively beneficial significant impact to the water quality and therefore the habitat in Puget Sound.

4.5.7 Socioeconomics and Environmental Justice

Impacts to Socioeconomics and Environmental Justice vary according to the alternatives. Cumulative effects related to socioeconomics could result from changes to Port activities (i.e., acquisition or redevelopment of Port properties) and other redevelopment activities in the City of Seattle region. Cumulative socioeconomic effects have been assessed for local economic effects such as job reduction and creation. Additionally, cumulative effects on environmental justice communities have been evaluated based on the impact assessment results for issues that affect these communities, such as air quality and noise. The primary project that would drive a change in socioeconomic impact would be the short-term lease of Terminal 46. The primary project that would drive a change to environmental justice would be the renewal of the St. Martin de Porres homeless shelter lease.

Impacts to the St. Martin de Porres homeless shelter would be the same under any alternative. The St. Martin de Porres homeless shelter lease expires in Summer of 2023. If an extension is requested by the USACE, the extension would require relocation during any renovation or construction of Building 7, and the impacts would occur as is described in Section 3.7, *Socioeconomics and Environmental Justice*. If the USACE does not request a lease, or if Building 7 must be demolished, there would be a loss of 212 beds for an environmental justice community. If the lease is not renewed, any construction would occur post-lease expiration, and the lease would not be considered a cumulative impact and therefore would not contribute to impacts to an environmental justice community. Therefore, this analysis considers the impacts to the environmental justice community as if the lease is renewed.

4.5.7.1 Alternative 1

The short term lease of Terminal 46 would have no overlapping effect that could cause additional impacts to socioeconomics because the short-term lease overlaps with the same footprint as Alternative 1. There would be improvements to the shelter network and housing for homeless individuals over time, but these projects would only provide additional shelter to help meet the current demand. Therefore there would be no additional significant cumulative impacts on socioeconomics and environmental justice.

4.5.7.2 Alternative 2

Under Alternative 2, there would be an additional loss of 28.9 acres of cargo/container terminal space. If the land acquisition would occur at the same time as the short term lease, this would result in a temporary loss of up to 54.9 acres of terminal space. This would also remove half of the berths from operation at Terminal 30. This would total 3 berths lost overall during the short term lease. The loss of this space would cause additional job loss, payroll loss, and revenue loss beyond that proposed as part of Alternative 2 (see Table 4.5-1). Given the combined loss, there would be additional adverse impacts to socioeconomics under Alternative 2. There would be improvements to the shelter network and housing for homeless individuals over time, but these projects would only provide additional shelter to help meet the current demand. While the temporary lease would not rise to the level of significance on its own, the impacts from Alternative 2 would already be a potentially significant impact on socioeconomics and environmental justice.

Table 4.5-1 Cumulative Economic Metrics for Alternative 2

Economic Metric	Total Port	Reduction Attributed to Acquired Property					Estimated NWSA-wide Total After Reduction		Estimated NWSA-wide Total After Reduction	
		Terminal 30		Short Term Lease 26 Ac at T46*	Net Impact		Alt 2 Total Impact		Cumulative Impact Total	
		19 acres	27 acres		19 acres	27 acres	19 acres	27 acres	19 acres	27 acres
Reduced TEU (0.5%)	3,700,000	-12,506	-19,917	-24,086	-32,423	-44,033	3,682,399	3,674,987	3,667,577	3,655,997
Direct Jobs	14,890	-50	-80	-97	-130	-177	14,819	14,789	14,760	14,713
Secondary Jobs	30,610	-103	-165	-199	-268	-364	30,464	30,403	30,342	30,246
Direct Payroll ($M)	$1,500	-5.10	-8.10	-10.00	-13.20	-18.10	$1,492.90	$1,489.90	$1,486.80	$1,481.90
Secondary Payroll ($M)	$1,700	-5,70	-9.20	-11.00	-14.90	-20.20	$1,691.90	$1,688.50	$1,685.10	$1,679.80
Direct Revenue ($M)	$4,500	-15.20	-24.20	-29.00	-39.40	-53.20	$4,478.60	$4,469.60	$4,460.60	$4,446.80
Secondary Revenue ($M)	$5,200	-17.60	-28.00	-34.00	-45.60	-62.00	$5,175.30	$5,164.80	$5,154.40	$5,138.00

* Short Term Lease includes 5.5 acres of overlap that would be found in Alternative 2.

4.5.7.3 Alternative 3

Similar to Action Alternative 1, the overlapping acreage of purchase that would occur at T46 would result in no additional cumulative economic losses. Therefore, the impacts of Alternative 3 remain potentially significant, but there is no additional cumulative impact to socioeconomics.There would be improvements to the shelter network and housing for homeless individuals over time, but these projects would only provide additional shelter to help meet the current demand. Therefore, no additional significant cumulative impacts would occur..

4.5.7.4 No Action Alternative

The No-Action Alternative would not result in a noticeable change to socioeconomics as the Warehouse 5 improvement would improve efficiency, but the amount of money that it would improve efficiency by would be minor and difficult to quantify compared to the overall health of socioeconomics in Seattle and King Counties. There would be improvements to the shelter network and housing for homeless individuals over time, but these projects would only provide additional shelter to help meet the current demand. Therefore, no significant impacts would occur under the No-Action Alternative.

4.5.8 Cultural Resources

Under the Proposed Action, construction-related activities including demolition, rehabilitation, and reconstruction are not anticipated to impact any NRHP-eligible resources, pending further NRHP evaluation underway by the Coast Guard. Because no historic properties are known to exist within the Project area, no cumulative effects are anticipated to occur. The Proposed Action is not likely to add to the cumulative effects on archaeological resources that are eligible or listed in the NRHP.

Under the Proposed Action, long-term visual characteristics at Base Seattle would be largely unchanged from the existing condition because the uses internal to Base Seattle would remain similar to those under the existing condition (i.e., vessel repair and maintenance activities would still occur within the boat basin and alongside maintenance facilities). In addition, new building construction and building rehabilitations would remain within the expanded Base footprint. Final assessment of visual impacts is pending Section 106 consultation and completion of project design. The Proposed Action, when combined with cumulative development occurring in surrounding areas, would likely have no cumulative impacts to the vicinity because the new construction and alteration to existing buildings would remain within an industrial setting, similar to current conditions. Port projects in the immediate or neighboring areas would require separate evaluation for effects to historic resources.

Ongoing and future redevelopment of the transportation infrastructure immediately surrounding and associated with Base Seattle is not expected to generate any impacts on NRHP-eligible historic properties, pending further NRHP evaluation underway through the Coast Guard.

Subsistence harvests have been ongoing for many millennia within the East Waterway and greater Elliot Bay adjacent to Base Seattle. Coordination efforts are ongoing between the Coast Guard and the Muckleshoot Indian Tribe and Suquamish Tribe, who have U&A fishing areas in proximity to Base Seattle. Proposed Action construction-related activities, established security zones limiting access, and associated short-term noise may interrupt or inhibit fishing, contributing to the cumulative effects on U&A fishing (refer to Section 3.8, *Cultural Resources*).

The Coast Guard will complete appropriate consultation with the Tribes. The Port of Seattle has existing Maritime Access and Impact Mitigation Agreements with the Muckleshoot Indian Tribe and the

Suquamish Tribe (Muckleshoot Indian Tribe, Port of Seattle, and Northwest Seaport Alliance 2016; Suquamish Tribe, Port of Seattle, and Northwest Seaport Alliance 2016, 2021). These agreements outline the processes undertaken between the Port, the Northwest Seaport Alliance, and the Tribes for Port facilities operations and development and management of the shared waters. These agreements also outline consultation for permit submittals with the objective of avoiding and minimizing potential negative effects on Treaty fishing access. Any other entity conducting work on the area that could impact treaty rights would also have to coordinate with Tribes to ensure that there is no impact to the Tribal Treaty Rights.

4.5.8.1 Alternative 1

Cumulative impacts under Alternative 1 would be as described above. Under Alternative 1, the construction activities at the shoreline, combined with the Proposed Action, could result in impacts to Treaty Fishing Rights. The removal of creosote pilings and contaminated sediments during Puget Sound CERCLA actions would provide a net benefit to the species that transverse the region and therefore U&A fishing rights. Therefore, there would be no significant impacts.

4.5.8.2 Alternatives 2

Cumulative impacts under 2 and 3 would differ due to the CERCLA project differences. While the CERCLA project would remove contaminated sediments that affect U&A resources (fish and shellfish), it would also result in a greater loss of in-water habitat. The removal of land mass would remove shellfish beds and change the topography and bathometry of the nearshore areas. The removal of contaminated sediments to a much greater depth would result in the loss of nearshore habitat that is helpful to the health and viability of U&A species. Additionally, short-term impacts on U&A fishing would result from degradation of water quality from disturbance of contaminated sediments, and long-term impact would result from increased shading and loss of water areas due to pier construction. Without mitigation, the permanent loss of habitat may cause a loss of U&A resources. The permanent loss of U&A resources could be a greater potentially significant cumulative impact on cultural resources.

4.5.8.3 Alternative 3

Alternative 3 would result in similar impacts as Alternative 2, but with less intensity and magnitude since the amount of land that would be required to complete the CERCLA project. Without mitigation, the permanent loss of habitat may cause a loss of U&A resources. The permanent loss of U&A resources could be a greater potentially significant cumulative impact on cultural resources.

No-Action Alternative Under the No-Action Alternative there would be no change to U&A fishing rights. There would however be additional beneficial impacts to U&A fishing rights due to ongoing CERCLA actions in the Puget Sound. The impacts would not be significant becuase it would not increase U&A fishing rights areas.

4.5.8.4 Noise

The impacts for noise would be highly similar across all alternatives. Construction-generated noise may result in cumulative noise impacts at locations where for the duration that construction noise overlap occurs. Cumulative effects would occur if multiple overlapping projects would generate noise that exceeds the City of Seattle Noise Ordinance limits. Specifically, cumulative noise impacts related to redevelopment of Base Seattle would only occur less than 500 feet from the Base Seattle boundary. As described in Section 3.9, *Noise*, Base Seattle construction-generated noise would not exceed the City of

Seattle Noise Ordinance beyond this distance. Therefore, cumulative noise impacts would only occur if other noise-generating activities occur within this area surrounding Base Seattle. Of the various cumulative projects listed in Table 4-1, only Port of Seattle projects at Terminals 30 and 46 and various WSDOT and City of Seattle road and street maintenance activities have the potential to generate sound within the radius of Base Seattle-generated noise. For cumulative noise impacts to occur, these activities would need to occur simultaneously and would be limited only to the short-term duration of the overlap. Therefore, any potential adverse cumulative noise impacts (i.e., exceedance of the City of Seattle Noise Ordinance) would be short-term and limited to the geographic area where noise from projects overlap.

Under all alternatives, including the No Action Alternative, long-term, operational noise generated at Base Seattle and the acquisition parcels would be largely unchanged from existing conditions. Therefore, no significant cumulative noise impacts are expected.

4.5.9 Utilities and Public Services

The impacts to utilities and public services would be similar across all alternatives. Reasonably foreseeable development and other actions at Base Seattle and the Port of Seattle have the potential to result in cumulative effects related to utilities and public services. For example, the Port of Seattle had previously considered construction of a new cruise ship terminal at Terminal 46, and other potential development scenarios are being contemplated by Port of Seattle/Northwest Seaport Alliance in response to fluid economic conditions. Similar to the Proposed Action and its alternatives, other proposed Port of Seattle development would result in frequent, short-term interruptions of utility service at Terminal 46 during construction. Details on construction activities and timing are not currently available for the proposed expansion and modernization of Base Seattle or the cumulative projects at the Port of Seattle. The schedule for these utility outages would however be coordinated with the utility provider, as necessary, and communicated throughout Base Seattle and with the Port of Seattle. Because these and other development projects generally reconstruct or expand existing infrastructure, it is anticipated that there would be no long-term considerably cumulative operational impacts related to utility service.

While cumulative development may result in additional utility demands, each cumulative project would be coordinated with the appropriate utility providers to ensure adequate supply prior to construction. None of the other reasonably foreseeable projects at the Port of Seattle would be likely to induce substantial permanent growth that would dramatically affect service ratios or response times for the Port police or other service providers. Additionally, given that Base Seattle is a secured, contained facility, the proposed modernization of Base Seattle would not measurably affect the service ratios or response times for fire protection, EMS, or police protection services. Therefore, the implementation of the Proposed Action and the No-Action Alternative, when combined with cumulative projects, would have no significant cumulative impacts on utilities or public services.

4.5.10 Hazardous Materials and Wastes

Reasonably foreseeable development and other actions at Base Seattle and the Port of Seattle have the potential to result in cumulative effects related to hazards and hazardous materials. Similar to the Proposed Action, Port of Seattle projects would result in the temporary use of hazardous materials (e.g., petroleum, oils, and lubricants, hydraulic fluids) during construction. These projects could also disturb previously contaminated soils and/or groundwater and result in the transport of hazardous materials. Construction activities would be coordinated with USEPA and the Department of Ecology, as necessary,

to ensure that there would be no interruption of ongoing environmental cleanup activities. Additionally, all cumulative projects at the Port of Seattle would be required to comply with all federal, state, and local laws and regulations regarding the use of hazardous materials and transport of hazardous wastes.

As described in Section 1.2.2, *Comprehensive Environmental Response, Compensation, and Liabilities Act Action at Base Seattle*, the Coast Guard, in collaboration with the USEPA, is executing a removal action in accordance with the NCP, as described in 40 CFR §300.15, at Slip 36 of Base Seattle. CERCLA actions—Slip 36 within Base Seattle and the wharf area at the southern end of Terminal 46—would occur concurrently with the Proposed Action but as separate actions. Additional restoration, cleanup, and removal actions are occurring with the area. During the implementation of these projects additional contaminated sediments are released into the water, but over the long term there would be a significant beneficial impact on the environment.

Operational storage and use of hazardous materials at Base Seattle, as well as the disposal of hazardous wastes, would continue to comply with existing federal, state, and local regulations. Additionally, the Coast Guard would continue to comply with Commandant Instruction Manual 16478.1B, and the Coast Guard Integrated Waste Management Compliance Job Guide.

4.5.10.1 Alternative 1

Cumulative impacts under Alternative 1 would be as described above. Under Alternative 1, the construction activities at the shoreline combined with the Proposed Action would not result in additional significant adverse impacts . The CERCLA actions within the Puget Sound would however result in the cleanup of contamination. The removal actions would reduce exposure of humans and wildlife to and therefore result in a significant beneficial impact.

4.5.10.2 Alternative 2

Under Alternative 2 there would be a removal of land and contaminated underwater sediments. Increased water-borne contaminant loads are expected while sediment removal and cleanup are occurring. The duration and intensity of these impacts would vary based on the duration and expanse of the associated CERCLA action. While short-term cumulative impacts have the potential to be significantly adverse, long-term cumulative impacts as contaminated material is removed following the completion of CERCLA actions and would be significantly beneficial.

4.5.10.3 Alternative 3

The impacts of Alternative 3 would be similar to the impacts under Alternative 2 but of a lesser magnitude. While the short-term cumulative impacts have the potential to be significantly adverse, long-term cumulative impacts as contaminated material is removed following the completion of CERCLA actions would be significantly beneficial.

4.5.10.4 No-Action Alternative

Under the No-Action Alternative, CERCLA actions within the Puget Sound would result in the cleanup of contamination. The removal actions would reduce exposure of humans and wildlife to and therefore result in a significant beneficial impact.

4.5.11 Visual Resources

Based on the impact assessment presented in Chapter 3, the area relevant for a discussion of cumulative visual impacts includes Base Seattle and surrounding viewshed along the industrial waterfront of Elliott Bay. As described in Section 3.12, *Visual Resources,* each of the action alternatives evaluated for the proposed expansion and modernization of Base Seattle would be consistent with onsite and regional visual characteristics (i.e., those typical of an industrialized waterfront). The various cumulative projects with a cumulative overlap with the Proposed Action and action alternative ranges from the City of Seattle's Elliott Bay Waterfront redevelopment that includes additional bicycle and pedestrian paths along the waterfront that would provide views of Base Seattle from the north. Other cumulatively considerable waterfront developments include various Port of Seattle projects to modernize waterfront facilities such as rehabilitation and redevelopment of Terminal 91. These Port of Seattle waterfront development projects would be either similar to existing development (e.g., reconstructing a deteriorating terminal) or supporting waterfront uses (e.g., upland development supporting maritime uses). Cumulative waterfront development projects would be consistent with existing land use and zoning and would be visually consistent and compatible.

4.5.11.1 Alternative 1

Alternative 1 would have the same impacts as described above. There would be no cumulatively significant impacts.

4.5.11.2 Alternative 2

Alternative 2 would result in the reshaping of the shoreline due to the CERCLA actions that would be necessary to support any construction. The reshaping of the shoreline would result in a large visual difference to viewers of Elliott Bay. Without details of the extent of the modifications, it is not possible to fully describe the extent of this change and what the change would look like. Therefore, be potentially significant impacts would occur to visual resources under Alternative 2.

4.5.11.3 Alternative 3

Alternative 3 would also reshape the shoreline. The extent of reshaping would most likely not be as intense as Alternative 2. Without details of the extent of the modifications, it is not possible to fully describe the extent of this change and what the change would look like. Therefore, there would be potentially significant impacts to visual resources under Alternative 3.

4.5.11.4 No-Action Alternative

Under the No-Action Alternative, there would not be a noticeable visual change to Base Seattle and the acquisition parcels. Therefore, no impacts would occur to visual resources.

4.5.12 Recreation

The Pier 58 modernization project would result in a temporary closure of the park during construction activities. These activities would be temporary in nature and would be consistent with ongoing activities associated with the industrialized waterfront, including those associated with Base Seattle, the Port of Seattle, and the surrounding Industrial District, which does not support any unique or high-value recreational resources. Long-term operation of the expanded and modernized Base would not have the potential to effect recreational resources in the region because neither the Base nor neighboring Port properties currently offer such opportunities.

4.5.12.1 Alternative 1

Alternative 1 would not lead to a change in recreational resource availability. As such, there would be no additional cumulative significant impacts.

4.5.12.2 Alternative 2

Impacts on recreation from the potential acquisition of Jack Perry Memorial Park would be limited because the park itself is predominantly paved, lacks natural features beyond modest landscaping, and has limited recreational opportunities. Jack Perry Memorial Park is not addressed in the SPR Strategic Plan and does not contribute substantively to recreational resources in the region. Some cumulative projects (e.g., Duwamish River People's Park, Pier 58) would improve recreational opportunities within the region with its addition of a new 14-acre waterfront park including a hand-carried boat launch. The Pier 58 project would result in the temporary closure of a park. Cumulatively, there would be a temporary loss of 1.1 acres but an overall gain of 11.9 acres of recreational space from these projects (see Table 4.5-2). If the temporary closure of Pier 58 would overlap with the long term acquisition of Jack Perry Memorial Park, this would result in a temporary loss of 2.22 acres of recreational space. If these projects overlap with the Duwamish River People's Park it would still result in a net gain of recreational space.

Table 4.5-2 Recreational Area Changes

Location	Permanent Acreage Change	Temporary Acreage Change
Duwamish River People's Park	14.0	
Jack Perry Memorial Park	-1.1	
Pier 58	-1.0	-1.1
Total	11.9	**-1.1**

Therefore, while the removal of Jack Perry Park would result in an adverse impact, no significant cumulative impacts would occur on recreation.

4.5.12.3 Alternative 3

Under Alternative 3 there would be no loss of Jack Perry Park. Therefore, no significant cumulative impacts would occur on recreation.

4.5.12.4 No-Action Alternative

The addition of land from the Duwamish River People's Park would outweigh the temporary and permanent loss of acreage at Pier 58. Under the No-Action alternative there would be beneficial impacts; however, they would not be significant because the acreage would not accommodate a significant amount of visitorship.

4.5.13 Greenhouse Gas Emissions and Climate Change

All of the action alternatives would result in minor increases in GHG emissions. This increase in GHG emissions would be negligible in comparison to regional GHG emissions and would not measurably effect on climate change. Cumulatively, the Coast Guard's Proposed Action and the other reasonably foreseeable projects would result in short-term, intermittent increases stationary and mobile source emissions during those phases of work, contributing to GHG emissions. Replacement of outdated

facilities would reduce or partially off-set overall stationary source GHG emissions. The Proposed Action when combined with other actions would not significantly cumulatively contribute to GHG emissions.

4.6 Comparison of Alternatives

When combined with cumulative impacts, the extent of most impacts under Alternatives 2 and 3 become much greater. Multiple resource areas would experience significant cumulative impacts due to the difference in potential CERCLA projects at 35 E/F and Terminal 30. Under Alternatives 2 and 3, the potential socioeconomic impacts would be much greater over the short-term. Under these same alternatives, long-term impacts would have greater significant or potentially significant impacts to the following resources:

- Land Use and Coastal Zone Management
- Geological Resources
- Water Resources
- Biological Resources
- Cultural Resources
- Hazardous Materials and Wastes
- Visual Resources
- Recreational Resources

Overall, Alternative 2 would cause the greatest amount of adverse environmental impacts, as shown in Table 4.6-1.

Table 4.6-1 Project Impacts when Considered with Cumulative Projects

Resource Area	Alternative 1	Alternative 2	Alternative 3	No-Action
Land Use	Significant impact is the same as impacts from the Proposed Action.	The significant impact would be greater. Additional adverse impacts due to the short term loss of berthing and cargo terminal operation space.	Significant impact is the same	No significant impacts.
Geological	No significant impacts.	Potentially significant impact due to the removal of sediments and land mass under the CERCLA projects	Potentially significant impact due to the removal of sediments and land mass under the CERCLA projects	No significant impacts.
Water	No significant impact is mostly the same with minor increases of surface runoff. Additional beneficial significant impacts due to Puget Sound wide CERCLA actions.	Additional potentially significant adverse impacts due to the removal of land mass, increase of water surface, and the unknown extent of sediment removal required under related CERCLA projects. Additional beneficial significant impacts due to Puget Sound wide CERCLA actions.	Additional potentially significant adverse impacts due to the removal of land mass, increase of water surface, and the unknown extent of sediment removal required under related CERCLA projects. Additional beneficial significant impacts due to Puget Sound wide CERCLA actions.	Beneficial significant impacts due to Puget Sound wide CERCLA actions.
Transportation	No significant impacts.	No significant impacts.	No significant impacts.	No impacts
Air Quality	No significant impacts.	No Significant impacts.	No significant impacts.	No significant impacts
Biological	No Significant Impact. Additional beneficial significant impacts due to Puget Sound wide CERCLA actions.	Adverse potentially significant impacts due to CERCLA project which would result in the removal of land mass, increase of water surface, and the unknown extent of sediment removal that could affect in-water habitats and species. Additional beneficial Significant Impacts due to Puget Sound wide CERCLA actions.	Adverse potentially significant impacts due to CERCLA project which would result in the removal of land mass, increase of water surface, and the unknown extent of sediment removal that could affect in-water habitats and species. Additional beneficial significant impacts due to Puget Sound wide CERCLA actions.	Additional beneficial significant impacts due to Puget Sound wide CERCLA actions.
Socioeconomics and Environmental Justice	Significant socioeconomic impact is the same. Additional minor beneficial impacts to the environmental justice community.	The significant impact to socioeconomics would be greater. Additional adverse impacts have a greater short-term impact due to the short-term lease. Additional minor beneficial impacts to the environmental justice community.	Significant Impact to socioeconomics is the same. Additional minor beneficial impacts to the environmental justice community.	No significant socioecomonic impacts. Minor but not significant beneficial impacts to the environmental justice community.

Resource Area	Alternative 1	Alternative 2	Alternative 3	No-Action
Cultural	No significant impacts. Additional beneficial impacts due to Puget Sound CERCLA actions.	Additional potentially significant impacts due to the CERCLA project, which would result in the removal of land mass and the unknown extent of sediment removal. During the course of this work, shellfish beds and nearshore habitat would likely be removed. Without the appropriate mitigation, this would adversely affect U&A fishing rights.	Additional potentially significant impacts due to the CERCLA project which would result in the removal of land mass and the unknown extent of sediment removal. During the course of this work, shellfish beds and nearshore habitat would likely be removed. Without the appropriate mitigation, his would adversely affect U&A fishing rights.	No significant impacts. Additional beneficial impacts due to Puget Sound CERCLA actions.
Noise	No significant impacts.	No significant impacts.	No significant impacts.	No impacts.
Utilities and Public Services	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.
Hazardous Materials and Wastes	Additional significant beneficial impacts due to multiple cleanup projects in the area.	Additional beneficial significant impacts due to multiple cleanup projects in the area.	Additional beneficial potentially significant impacts due to multiple cleanup projects in the area.	Additional beneficial potentially significant impacts due to Puget Sound CERCLA actions.
Visual	No significant impacts.	Potentially significant impacts would occur due to the removal of land mass. The extent of the visual changes is unknown at this time, but would result in a re-shaping of the shoreline.	Potentially significant impacts would occur due to the removal of land mass. The extent of the visual changes is unknown at this time, but would result in a re-shaping of the shoreline.	No Impacts.
Recreational	No significant impacts.	No significant impacts.	No significant impacts.	No Impacts.
Greenhouse Gasses and Climate Change	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.

5 Irreversible and Irretrievable Commitment of Resources

5.1 Unavoidable Adverse Impacts

The proposed modernization of Base Seattle would include three principal components: (1) land acquisition; (2) construction, demolition, and renovation activities; and (3) long-term operation of the expanded Base Seattle. Base Seattle and the adjacent Port of Seattle property are both currently developed and nearly entirely paved. As described in Section 3.7, *Socioeconomics and Environmental Justice*, it is anticipated that the proposed land acquisition would result in adverse impacts to socioeconomics associated with the loss of a portion of Terminal 46 and/or Terminal 30. In the context of the existing Port activity, this impact would not be significant. Additionally, the implementation of Alternative 2 would remove Jack Perry Memorial Park from public access and recreational opportunities. The loss of the park, in the context of the industrial waterfront, would not result in a significant impact to recreation, but could result in significant impacts on U&A fishing. Land-side construction activities would result in short-term, minor, adverse impacts that would be minimized through appropriate site design and the use of ECMs (see Appendix E). While the design details are currently unknown, in-water construction activities would have the potential to result in significant impacts to biological resources, water resources, hazardous materials and wastes, and cultural resources (U&A fishing) related to underwater noise, increased turbidity, and increased contaminant loads. The duration and extent of these impacts would be evaluated further as the design process and consultation with NMFS and tribes unfolds for these elements of the Proposed Action. The proposed operation of the expanded Base Seattle would result in increases in mobile air emissions and noise as well as the use of hazardous materials and the generation of hazardous wastes. These impacts would be minor in the context of the industrial waterfront. Increased vehicle trips could also increase congestion on local and on-Base transportation networks. Other roadway capacities would not be exceeded due to the Proposed Action, but result in minor to moderate adverse impacts on traffic.

5.2 Relationship Between Short-Term Uses and Long-Term Productivity

Short-term uses of the biological and physical components of the human environment include direct impacts, usually related to construction activities that occur over a period of less than 5 years. As shown in Figure 2.1-1, the total construction associated with modernization of Base Seattle may be nine-years. Long-term uses are those that are ongoing such as base operations and may include permanent resource loss.

The proposed expansion and modernization of Base Seattle would result in short-term adverse impacts on the natural environment as a result of construction activities. These potential adverse impacts include criteria air pollutant emissions, soil erosion, stormwater runoff into surface water, and the increase potential for a release of hazardous substances. A reduction in jobs and economic activities associated with the proposed acquisition of portions of Terminal 46 and/or Terminal 30 would be considered a long-term adverse impact on socioeconomics. Similarly, increases in daily vehicle trips associated with the increased Base population would result in long-term impacts on mobile source noise and air emissions as well as transportation.

5.3 Irreversible and Irretrievable Commitments of Resources

NEPA Section 102(C)(v) requires a detailed statement on any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action, should it be implemented. An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that cannot be

reversed or recovered except over an extremely long period of time. A commitment of resources is related to use or destruction of nonrenewable resources and the impacts that loss will have on future generations. These irreversible effects result primarily from destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

Under all alternatives of the Proposed Action, except for the No-Action Alternative, there would be irreversible and irretrievable commitments of materials, energy, landfill space, and human resources. The impacts on these resources would be permanent.

Materials. Material resources used irretrievably for the proposed expansion and modernization of Base Seattle include steel, concrete, and other building materials. Use of these materials represents a further depletion of natural resources. While delivery chains are constrained following the COVID-19 pandemic, the overall supply of construction materials is not limited. Construction and maintenance activities are considered a long-term, nonrenewable investment of these resources. The proposed modernization of Base Seattle would not however involve a significant amount of irretrievable material resources. The preferential use of recycled building materials would reduce the overall amount of materials used for building construction.

Energy. Energy resources consumed for construction and operation of the expanded Base Seattle represents a permanent and nonrenewable commitment of these resources. These include fossil fuels (e.g., gasoline, diesel, natural gas, No.2 fuel oil) and electricity. During construction, gasoline and diesel fuel would be used for the operation of construction vehicles and equipment. Long-term operation of new facilities would use electricity generated by combusting fossil fuels, both for primary and backup power. However, the proposed expansion and modernization of Base Seattle would replace existing inefficient buildings with new buildings that meet all applicable laws and regulations, Coast Guard policy (Coast Guard 2014), and Coast Guard guidance (Coast Guard 2020). This includes ensuring that all new construction includes the incorporation of climate resilient design and management elements. Overall, consumption of energy resources would not place a substantial demand on their availability in the region.

Landfill Space. The generation of construction and demolition debris and subsequent disposal of that debris in a landfill would be an irretrievable adverse impact. Construction and demolition activities also unavoidably generate solid waste but would not overwhelm the capacity of existing construction and demolition recycling facilities and/or landfills. If a greater percentage is recycled, then irretrievable impacts on landfills would be reduced. There are numerous construction and demolition landfills and processing facilities that could handle the waste generated. Any waste that is generated by the proposed expansion and modernization of Base Seattle and disposed of in a landfill would be considered an irretrievable loss of that landfill space.

Human Resources. The use of human resources for construction activities is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work activities. However, this use of human resources is for employment opportunities and is considered beneficial. Issues related to the potential loss of jobs and/or economic activities associated with the acquisition of parts of Terminal 46 and/or Terminal 30 is addressed in detail in Section 3.7, *Socioeconomics and Environmental Justice*.

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