FINAL
ENVIRONMENTAL IMPACT STATEMENT/ OVERSEAS ENVIRONMENTAL IMPACT STATEMENT FOR DISPOSAL OF DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65) AND ITS ASSOCIATED NAVAL REACTOR PLANTS

JUNE 2023

Abstract

Designation:	**Environmental Impact Statement/Overseas Environmental Impact Statement**
Title of Proposed Action:	Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants
Project Location(s):	Mobile, AL; Brownsville, TX; Hampton Roads Metropolitan Area, VA; Puget Sound Naval Shipyard and Intermediate Maintenance Facility, Bremerton, WA; Benton County, WA
Lead Agency for the EIS:	United States Department of the Navy
Cooperating Agency:	United States Department of Energy
Affected Region(s):	Mobile County, AL; Cameron County, TX; Hampton Roads Metropolitan Area, VA; Kitsap County and Benton County, WA
Action Proponent:	Director, Naval Nuclear Propulsion Program
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The U.S. Department of the Navy, along with the Department of Energy as a cooperating agency, has prepared this Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality Regulations and Navy regulations. This EIS/OEIS was also prepared to comply with Executive Order 12114, *Environmental Effects Abroad of Major Federal Actions.* The Action Proponent is Director, Naval Nuclear Propulsion Program. The Proposed Action is to dispose of ex-Enterprise (CVN 65), including its defueled naval reactor plants. Disposal includes dismantling and recycling the remnant hull sections at a government facility or through a contract with an authorized commercial facility in accordance with applicable federal, state, and local laws, and removing and packaging the reactor plants or components for transportation and disposal as low-level radioactive waste at an authorized radioactive waste disposal facility or facilities. This EIS/OEIS evaluates the potential environmental impacts associated with three action alternatives and the No Action Alternative to the following resource areas: Public and Occupational Health and Safety, Hazardous and Radioactive Waste Management, American Indian Tribal Resources and Tribal Rights, Socioeconomics and Environmental Justice, Biological Resources, Air Quality (including greenhouse gases and climate change), Cultural Resources, and Noise.

Environmental Impact Statement/ Overseas Environmental Impact Statement

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants

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ES Executive Summary

ES.1 Summary

This document summarizes the Final Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants. It provides background on the Naval Nuclear Propulsion Program (NNPP) and describes the purpose and need for the Proposed Action, environmental impacts of the alternatives considered, and the results of the public involvement process. A preferred alternative is identified at the end of this Summary.

ES.2 Introduction

The United States (U.S.) Department of the Navy (Navy) has prepared this EIS/OEIS to evaluate the potential environmental impacts associated with disposal of the decommissioned, defueled aircraft carrier ex-Enterprise (CVN 65) to include its naval reactor plants. Because it is now decommissioned, USS Enterprise is referred to as ex-Enterprise throughout this EIS/OEIS.

The National Environmental Policy Act (NEPA), and the regulations promulgated by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] Parts 1500-1508), establish environmental policy, set goals, and provide a means for implementing the policy. The key provision of NEPA requires preparation of an EIS for "major Federal actions significantly affecting the quality of the human environment" (40 CFR Part 1502.3). NEPA ensures that environmental information is available to public officials and citizens before decisions are made and actions are taken (40 CFR Part 1500.1(b)). This EIS/OEIS has been prepared in accordance with NEPA, as amended (42 United States Code [U.S.C.] Section 4321 et seq.), as well as CEQ regulations. The Navy also prepared this EIS/OEIS to comply with Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*. The Navy is the lead agency for this EIS/OEIS pursuant to 40 CFR Part 1501.5. The U.S. Department of Energy (DOE) is a cooperating agency for this EIS/OEIS, pursuant to 40 CFR Part 1501.6 and Part 1508.5.

ES.3 Background

Ex-Enterprise (Figure ES-1), the first U.S. Navy nuclear-powered aircraft carrier, was commissioned in 1961, operated for over 50 years, and was decommissioned in 2017. Ex-Enterprise has eight reactor plants housed in four reinforced compartments inside the ship. As part of the decommissioning process, the nuclear fuel was removed from the eight reactor plants and handled in accordance with standing NEPA documents for spent naval nuclear fuel (DOE, 1995, 2016; Navy, 1994, 2009). The spent fuel now resides within the DOE Idaho National Laboratory property. Ex-Enterprise is currently stored pier-side at Huntington Ingalls Industries Newport News Shipbuilding in Newport News, Virginia.



Figure ES-1: USS Enterprise

In 1984, the Navy, with DOE as a cooperating agency, prepared the *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Naval Submarine Reactor Plants*, which evaluated alternative processes for the disposal of reactor plants from various submarines (Navy & DOE, 1984). In the December 6, 1984, Record of Decision (ROD), the Navy selected a process to dispose of various submarine reactor plants by removing the reactor compartments from the submarines at Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) in Bremerton, Washington, and sealing them to provide a high-integrity welded steel package meeting Department of Transportation, Nuclear Regulatory Commission (NRC), and DOE safety requirements (Navy, 1984). The alternative selected by the Navy includes transporting each reactor compartment package by barge to the Port of Benton barge slip in Richland, Washington followed by transferring the reactor compartment package to land disposal in Trench 94 (Figure ES-2) at the DOE Hanford Site near Richland, Washington, via multiple-wheel, high-capacity transporter.

In 1996, the Navy, with DOE as a cooperating agency, prepared an EIS, *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants* to evaluate the disposal of reactor plants from cruisers, Ohio-Class submarines, and Los Angeles-Class submarines (Navy & DOE, 1996), hereafter referred to as the 1996 EIS. The Navy signed a ROD on July 3, 1996, extending the reactor compartment disposal program at PSNS & IMF to these classes of ships. The 1996 EIS updated the analysis of reactor compartment disposal from the 1984 EIS for subsequent submarine and cruiser reactor compartment disposals. As of October 2022, the Navy has successfully shipped 140 reactor compartment packages from inactivated, defueled nuclear ships using the process described above.



Figure ES-2: Barge Transport and Reactor Compartment Disposal Trench 94

In 2012, the Navy, with DOE as a cooperating agency, prepared the *Final Environmental Assessment on the Disposal of Decommissioned Defueled Naval Reactor Plants from USS ENTERPRISE (CVN 65)*, hereafter referred to as the 2012 EA (Navy & DOE, 2012). A Finding of No Significant Impact was signed August 23, 2012, by the Navy and publicly released in August 2012. The 2012 EA extended the established reactor compartment disposal program at PSNS & IMF to include disposal of reactor plants from ex-Enterprise in eight single reactor compartment packages transported to the DOE Hanford Site. Remnant hull sections would be removed and recycled under an existing PSNS & IMF program, as described in the *U.S. Naval Nuclear Powered Ship Inactivation, Disposal, and Recycling Report* (Navy, 2019). This program facilitates cruiser and submarine deconstruction for reactor compartment disposal under the 1996 EIS (Navy & DOE, 1996). Each of the eight single reactor compartment packages would be similar in size and weight to the ex-Long Beach cruiser reactor compartment packages evaluated in the 1996 EIS. This process would not require substantial changes to the infrastructure at PSNS & IMF, the Port of Benton barge slip, the transport road, or Trench 94 at the DOE Hanford Site. Temporary docking aids would be required at PSNS & IMF, which would primarily be a guiding system of rollers temporarily installed on the dry dock walls and on the inlet-facing walls on both sides of the dry dock opening. No in-water work would be required, and the structures would be removed after reactor compartment packaging and recycle is complete.

Subsequent to the 2012 EA, the Navy identified additional action alternatives associated with dismantling and disposal of ex-Enterprise as part of a 2014 PSNS & IMF study (Navy, 2014). The study showed the new alternatives, which packaged the reactor compartments at PSNS & IMF in fewer packages, could reduce costs and worker radiation exposure while also improving execution schedule. Separately, the Navy identified available alternatives for dismantlement based on the following criteria: (1) successful and ongoing conventional Navy aircraft carrier dismantlement by contract at commercial facilities, (2) successful ongoing commercial nuclear power plant decommissioning by contract with

nuclear services companies, and (3) successful dismantlement of a U.S. Army barge (STURGIS) containing a defueled nuclear reactor by contract with nuclear services companies at commercial facilities. Combining these models, the Navy determined it was feasible for contracted commercial companies to dismantle the entire ex-Enterprise including its naval reactor plants.

ES.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to reduce the Navy inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy.

Dismantling and disposing of ex-Enterprise is needed to comply with NNPP statutory responsibilities and Chief of Naval Operations policy for inactive nuclear-powered ships stricken from the Naval Vessel Register. The NNPP, also known as the Naval Reactors Program, was established in 1948 and is a joint DOE and Navy organization with responsibility for all matters pertaining to naval nuclear propulsion from design through disposal. The integrated relationship, authorities, and responsibilities between DOE and Navy for naval nuclear propulsion are specified in EO 12344 and codified in 50 U.S.C. Sections 2511 and 2406. The NNPP mission is to provide the United States with safe, effective, and affordable naval nuclear propulsion plants and to ensure their continued safe and reliable operation through lifetime support, research and development, design, construction, specification, certification, testing, maintenance, and disposal. As required by CEQ regulations (40 CFR Part 1502.14) and Navy regulations (32 CFR Part 775) for implementing NEPA and EO 12114, the Navy must evaluate reasonable alternatives and a No Action Alternative. This EIS/OEIS complies with the CEQ regulations in 40 CFR Parts 1500-1508 (1978, as amended 1986 and 2005), because the Navy began this EIS/OEIS prior to the release of both the current regulations in effect May 20, 2022, and the previous regulations in effect September 14, 2020. Alternatives for the Proposed Action must be technically and economically feasible while meeting the purpose and need and supporting the Navy mission.

ES.5 Scope and Content of the Environmental Impact Statement/Overseas Environmental Impact Statement

CEQ regulations for implementing NEPA (40 CFR Part 1500) provide guidance for considering alternatives to a federally Proposed Action. This guidance requires rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined by the Navy to be reasonable require detailed analysis (see 40 CFR Part 1502.14). Reasonable alternatives are those that meet the purpose and need, meet screening factors, and are practical or feasible from a technical and economic standpoint. Those the Navy determined would not meet the purpose and need or screening factors, or were not practical or feasible, were not carried forward for detailed study.

The Navy has considered all potentially relevant environmental resource areas for analysis in this EIS/OEIS. To comply with NEPA, as well as CEQ, Navy, and DOE regulations, the discussion of the affected environment (e.g., existing conditions) focuses on those resource areas that would potentially be subject to more-than-negligible impacts as a result of the implementation of a given alternative. The level of detail describing a resource corresponds with the anticipated level of potential impact.

Describing the affected environment and analyzing impacts requires a comprehensive and systematic review of relevant literature and data to ensure the Navy uses the best available information for analysis. Each section in Chapter 3 (Affected Environment and Environmental Consequences) describes

the data used and the characteristics of the best available data, and provides a general approach to analysis. Each resource section also lists the regulations applicable to that resource, discusses the affected environment and the environmental consequences of implementing the No Action and action alternatives, and summarizes potential impacts.

The Navy assessed potential impacts on eight resource categories in Chapter 3 (Affected Environment and Environmental Consequences [Sections 3.1 {Public and Occupational Health and Safety} through 3.8 {Noise}]). Table 3.9-1 presents the impacts in each of the resource categories analyzed. The eight resource categories assessed are as follows:

- Public and Occupational Health and Safety
- Hazardous and Radioactive Waste Management
- American Indian Tribal Resources and Tribal Rights
- Socioeconomics and Environmental Justice
- Biological Resources
- Air Quality (including greenhouse gas and climate change)
- Cultural Resources
- Noise

As part of the process of determining environmental consequences, the Navy applies current resource protection measures (e.g., standard operating procedures, management practices, conservation measures) that are integral to the activities covered by the Proposed Action and alternatives. If the analysis identifies potential adverse impacts on the resource from implementing the No Action or action alternatives, the Navy has identified methods and coordinated with federal agencies to minimize or mitigate those impacts, where appropriate and practical. Mitigation measures are discussed at the end of each resource section if applicable and summarized in Section 3.9 (Summary of Potential Impacts on Resources and Impact Avoidance and Minimization).

In accordance with the CEQ Regulations, 40 CFR Part 1505.2, the Navy will sign a ROD that provides the rationale for selecting one of the alternatives.

ES.6 Government and Public Involvement

ES.6.1 Scoping Process

Scoping is an early and open process for developing the "scope" of issues to be addressed in an EIS and for identifying significant issues related to a proposed action. The purpose of public involvement and outreach during the public scoping period of the EIS/OEIS is to (1) notify and inform tribes, stakeholders, and the public about the release of the Proposed Action and the intent of the Navy to prepare an EIS/OEIS, and (2) provide the opportunity for tribes, stakeholders, and the public to submit comments to inform the scope of the project and the environmental analysis.

In an effort to maximize public participation and ensure public input is considered, the Navy conducted public scoping for this EIS/OEIS. A Notice of Intent to prepare an EIS/OEIS was published in the Federal Register (FR) on May 31, 2019. The FR notice can be found in Appendix A (Federal Register Notices). The Notice of Intent announced the public scoping period and the dates, times, and locations of public scoping meetings. Display advertisements were published in 11 local and regional newspapers a total of 54 times from May 31, 2019, through June 23, 2019. The first series of advertisements was published to

coincide with the release of the Notice of Intent. A second series was published 10 days before the public meetings, and a third series was published two to five days before the public meetings. A Spanish version of the advertisement was published in a Spanish-language newspaper in the Brownsville, Texas, area. Adjustments were made according to the newspaper's publication frequency (e.g., daily, semi-weekly, weekly). The Navy sent tribal and stakeholder letters, postcards, and emails, and distributed news releases and public service announcements, to notify the public of the scoping period and public scoping meetings. A project website was established to provide the public with project information and to accept comments electronically. The Navy solicited public comments during the scoping period from May 31, 2019, through July 15, 2019.

The Navy held four public scoping meetings from June 18, 2019, through June 27, 2019, in Newport News, Virginia; Brownsville, Texas; Bremerton, Washington; and Richland, Washington. Each public meeting was held in an open-house-style format, with informational poster stations staffed by Navy representatives and an opportunity to provide written or oral comments.

As a result of comments received during the public scoping period, the Navy added the Mobile, Alabama area to the Study Area for this EIS/OEIS. In compliance with NEPA, the Navy held an additional public scoping period from August 12, 2020, through September 11, 2020. Display advertisements were published three times in the regional newspaper in Mobile, Alabama, and the Navy sent tribal and stakeholder letters, postcards, and emails, and distributed a news release, to notify the public of the reopened scoping period. Project information, including an updated fact sheet booklet and poster displays, were posted on the project website. Due to federal and state guidance and measures in response to the coronavirus disease of 2019 (COVID-19), the Navy was unable to hold an in-person public scoping meeting in Mobile, Alabama. To assist the public, the Navy established a project email address and responded to questions from the public. The public was able to submit comments by mail or the project website during the 30-day scoping period. The Navy received 120 comments during the 2019 public scoping phase and 34 comments during the 2020 public scoping phase. Of those, 1 comment was received from tribes, 4 from federal agencies, 10 from state and local agencies, 5 from non-governmental organizations, and 134 from the public. Appendix B (Public Involvement and Distribution) contains a brief description of the comments received during both scoping periods.

ES.6.2 Draft Environmental Impact Statement/Overseas Environmental Impact Statement

The Draft EIS/OEIS was released for public review on August 19, 2022, for a 45-day public comment period with the publication in the FR of a Notice of Availability of the Draft EIS/OEIS. A Notice of Public Meetings was published in the FR on August 19, 2022. The Navy has assessed that virtual public meetings are the best format to meet statutory requirements under NEPA while mitigating COVID-19 risks. Virtual public meetings were held on September 20 and 22, 2022. The purpose of public involvement and outreach during the public review and comment period of the Draft EIS/OEIS was to (1) notify and inform tribes, stakeholders, and the public about the Proposed Action and the release of the Draft EIS/OEIS; and (2) provide the opportunity to comment on the Draft EIS/OEIS. Display advertisements were published in local newspapers to advertise the notice of availability of the Draft EIS/OEIS, the public meetings, and the public review and comment period.

Details regarding the public comment period for the Draft EIS/OEIS are available in Appendix B (Public Involvement and Distribution). The public was able to submit comments by mail or the project website during the 45-day public comment period. The Navy received 45 comments from the public during the public review and comment period. Of those, 1 comment was received from federal agencies, 1 from

tribes, 6 from state and local agencies, 5 from non-governmental organizations, and 32 from the public. The Navy considered comments received from the public comment period in the development of this Final EIS/OEIS. Public comments received and responses to comments can be found in Appendix C (Public Comments and Responses).

This EIS/OEIS was prepared to assess potential impacts of the Proposed Action on the environment. This EIS/OEIS assesses potential impacts of all the alternatives (the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 [Preferred Alternative]).

ES.6.3 Final Environmental Impact Statement/Overseas Environmental Impact Statement and Record of Decision

The Final EIS/OEIS public review and 30-day wait period will begin with the publication of a Notice of Availability in the FR. The intent of public involvement efforts during the Final EIS/OEIS phase of the NEPA process is to notify tribes, stakeholders, and the public of the availability of the document, the 30-day wait period, and the next steps in the NEPA process.

The ROD phase of the NEPA process follows the Final EIS/OEIS 30-day wait period and includes selection of an alternative by the Office of the Assistant Secretary of the Navy.

A Notice of Availability of the ROD will be published in the FR. The intent of public involvement efforts during this phase of the NEPA process is to notify tribes, stakeholders, and the public of the availability of the ROD and where it can be accessed.

ES.7 Proposed Action and Alternatives

The Navy Proposed Action is to dispose of ex-Enterprise, including its naval reactor plants. Disposal includes dismantling and recycling the remnant hull sections at a government facility or through a contract with an authorized commercial facility in accordance with applicable federal, state, and local laws, and removing and packaging the reactor plants or components for transportation and disposal as low-level radioactive waste (LLRW) at an authorized radioactive waste disposal facility or facilities.

Alternatives that incorporate the current reactor compartment disposal process at PSNS & IMF would first require partial dismantlement by removing portions of ex-Enterprise outside of reactor compartments at a commercial facility. An additional alternative (Alternative 3 [Preferred Alternative]) under consideration is for the entire ex-Enterprise, including its naval reactor plants, to be dismantled at a commercial facility. Materials that are not required to be controlled as radioactive would be properly disposed of or recycled. Radioactive materials would be packaged and shipped as radioactive waste to licensed commercial LLRW disposal sites, or to DOE radioactive waste disposal sites. Alternative 3 (Preferred Alternative) is modeled after successful and ongoing conventional Navy aircraft carrier dismantlement by contract at commercial facilities; successful and ongoing commercial nuclear power plant decommissioning by contract with nuclear services companies; and the successful dismantlement of a U.S. Army barge STURGIS containing a defueled nuclear reactor by contract with nuclear services companies at commercial facilities. Several civilian, land-based, nuclear power plants, which are larger than Navy aircraft carrier reactor plants, have successfully been dismantled and disposed of by the commercial nuclear services industry.

The Navy has identified Alternative 3 – Commercial Dismantlement as the preferred alternative for the following reasons:

- The Navy has a strong operational focus in the Pacific region, and the PSNS & IMF work supporting the operational nuclear fleet is vital to the Navy's continued mission. As a result of growing workload due to a higher fleet operational tempo and capacity shortages across all of the Navy public shipyards, PSNS & IMF is challenged to execute their current and projected workload with existing and planned facilities. Leveraging options to perform ex-Enterprise disposal at commercial facilities is advantageous to the Navy and allows PSNS & IMF to prioritize the limited public shipyard infrastructure and workforce for active fleet maintenance.
- The workforce of the public shipyards of the Navy has been under tremendous pressure to execute their primary mission of maintaining the operational fleet. Commercial dismantlement of ex-Enterprise would allow the Navy to keep the specially trained and qualified PSNS & IMF workforce focused on high-priority fleet maintenance work and submarine inactivations that are already part of PSNS & IMF workload.
- Whether or not PSNS & IMF is assigned ex-Enterprise reactor compartment package availability, the planned workload at PSNS & IMF, plus anticipated growth, exceeds the existing workforce capacity identified in the latest 15-year workload projection.
- The environmental consequences identified for the three action alternatives are comparable, and analysis of commercial dismantlement actions in this EIS/OEIS concluded that commercial dismantlement actions would result in no significant impacts.
- The Navy is continually seeking ways to reduce costs and ensure that all work is completed in a manner protective of human health and the environment. Based on information about the known PSNS & IMF workload, the reactor compartment packaging alternatives would schedule the earliest completion of ex-Enterprise disposal between the years 2030 and 2040. Commercial dismantlement is estimated to be completed sooner and at a lower cost.

See Section 2.4 (Preferred Alternative) for a more detailed discussion of the reasoning for identifying Alternative 3 as the preferred alternative. While summarized below, the components of each alternative are presented in detail in Table 2-1.

ES.7.1 No Action Alternative

Under the No Action Alternative, ex-Enterprise would not be dismantled or disposed of and would be placed in waterborne storage for an indefinite time at its current location in Newport News Shipbuilding in Newport News, Virginia. This alternative would include maintenance and inspection work to prepare the ship for indefinite waterborne storage in a safe and environmentally acceptable manner.

ES.7.2 Alternative 1

Alternative 1 addresses a modification to the process described in the 2012 EA (Navy & DOE, 2012). The alternative would include towing the entire ex-Enterprise from Newport News Shipbuilding, along the coastline to an authorized commercial dismantlement facility in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama, where it would be partially dismantled by removing areas of the ship outside of reactor compartments, leaving a propulsion space section (about one-third of the aircraft carrier's original weight and length). The dismantlement work would be managed under Navy contract process. The propulsion space section, which contains the eight defueled reactor plants, would then be transported by heavy-lift ship around South America to PSNS & IMF in Bremerton, Washington, for further dismantlement and disposal. Upon arrival, PSNS & IMF would construct eight single reactor compartment packages for disposal at the DOE Hanford Site, following the established

Navy program. Reactor compartment packages (Type B packages as defined by the NRC in 10 CFR Part 71.4) are constructed from heavy steel, are welded to meet stringent integrity requirements, and meet all applicable federal requirements for transportation of radiological material.

A containment structure would be built around the reactor compartments, enclosing them to form the packages (approximately 36 feet (ft.) long x 40 ft. wide x 47 ft. high, and weighing 1,651 tons), similar in concept to past cruiser reactor compartment packaging. Reactor compartment packages would be transported by barge via the current program transport route to the Port of Benton barge slip on the west bank of the Columbia River at Richland, Washington. Each package would then be loaded onto multiple-wheel high-capacity transporters and hauled to Trench 94 at the DOE Hanford Site. Trench 94 is situated near the center of the DOE Hanford Site in the Central Plateau region and is approximately 1,600 ft. by 250 ft.

ES.7.3 Alternative 2

Partial dismantlement of ex-Enterprise at an authorized commercial facility under Alternative 2 would be the same as described under Alternative 1. The dismantlement work would be managed under the Navy contract process. However, under Alternative 2, the four conjoined pairs of reactor compartments would not be separated at PSNS & IMF. Instead, PSNS & IMF would construct and transport four dual reactor compartment packages (approximately 71 ft. long x 40 ft. wide x 47 ft. high, and weighing 3,304 tons) to be disposed of at Trench 94 at the DOE Hanford Site near Richland, Washington.

Each of the four reactor compartment packages of Alternative 2 would be transported by a barge capable of handling the larger dual reactor compartment packages via the current transport route from PSNS & IMF to the Port of Benton barge slip at Richland, Washington. Each package would be transported to the DOE Hanford Site via a multiple-wheel high-capacity transporter similar to Alternative 1.

This alternative would require modifications to the Port of Benton barge slip and improvements to the transport route to Trench 94 at the DOE Hanford Site due to the heavier weight and larger size of the dual reactor compartment packages. Modifications would involve excavation and fill to allow the widening of the barge slip, inland pile driving and concrete work, and improving portions of the transport route.

ES.7.4 Alternative 3 (Preferred Alternative)

Alternative 3 (Preferred Alternative) would include towing the ex-Enterprise from Newport News Shipbuilding to an authorized commercial dismantlement facility in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama and contracting the complete dismantlement of the ship by an authorized ship dismantlement contractor. Dismantlement would be managed under a Navy contract process. Under this alternative, the contractor would prepare reactor plant dismantlement and disposal planning documents to conform with NRC standards. The Navy envisions contractually invoking NRC standards and obtaining NRC oversight via an interagency support agreement. The Navy would retain regulatory authority and contractually support use of the NRC requirements. The NRC would review project planning and engineering documents, conduct oversight of project execution, and provide the Navy recommendations for Navy enforcement with the dismantlement contractor. The reactor plants and other LLRW from the ship would be packaged and disposed of as LLRW in accordance with applicable local, state, and federal laws.

Dismantlement of ex-Enterprise at an authorized commercial dismantlement facility includes disassembly of the eight defueled reactor plants for packaging into several hundred small containers. As applicable, waste transportation and other aspects of the proposed dismantlement would be conducted in accordance with applicable NRC, Department of Transportation, and DOE regulations.

There are suitable LLRW waste facilities available for radioactive waste produced by commercial dismantlement of ex-Enterprise. Non-radioactively contaminated portions of the ship would be recycled or disposed of in accordance with applicable local, state, and federal laws. Potential NRC agreement state-licensed waste facilities and the DOE LLRW waste facility are listed below:

- Waste Control Specialists, LLC – Andrews, Texas
- EnergySolutions – Clive, Utah
- The DOE Savannah River Site – Aiken, South Carolina

This alternative is based on successful and ongoing conventional Navy aircraft carrier dismantlement by contract at commercial facilities, successful ongoing commercial defueled reactor plant dismantlement by contract with nuclear service companies, and the successful dismantlement of a U.S. Army barge (STURGIS) containing a defueled nuclear reactor by contract with nuclear services companies at commercial facilities. Several civilian, land-based, defueled reactor plants, which are larger than Navy aircraft carrier reactor plants, have successfully been dismantled and disposed of by the commercial radiological services industry. Separately, there is a current program in Brownsville, Texas, where Navy conventional aircraft carriers similar in size to ex-Enterprise are being dismantled. Since the 2012 EA (Navy & DOE, 2012), four such Navy conventional aircraft carriers have been dismantled. A contract between such commercial ventures located at a facility that can dismantle aircraft carriers is envisioned for this alternative.

ES.8 Summary of Environmental Effects

Environmental effects that might result from the implementation of the Proposed Action have been analyzed in this EIS/OEIS. Physical resources that were considered for evaluation in this EIS/OEIS include biological resources (including threatened and endangered species) (Section 3.5) and air quality (Section 3.6). Human resources considered in this EIS/OEIS include public and occupational health and safety (Section 3.1), hazardous and radioactive waste management (Section 3.2), American Indian tribal resources and tribal rights (Section 3.3), socioeconomics and environmental justice (Section 3.4), cultural resources (Section 3.7), and noise (Section 3.8). Cumulative impacts (Chapter 4) were considered for all resources.

The Navy applied the best available science to all impact analyses in this EIS/OEIS. Table ES-2 and Table 3.9-1 summarize the potential environmental impacts and proposed mitigation of the Proposed Action.

ES.8.1 Health Risks from Radiation Exposure Associated with the Alternatives

Radiation exposure associated with the Proposed Action and alternatives would comply with applicable federal limits. Detailed discussion of the nature of radiation, radiation measuring units, and occupational dose are included in Appendix E (Radiological Evaluation of Reactor Plant Disposal Alternatives). Methods for quantifying health risks from radiation exposure for the Proposed Action and alternatives for transportation of radioactive materials are described in Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants).

Hypothetical health effects from exposure to low levels of radiation can be expressed in terms of estimated potential latent cancer fatalities. The health risk conversion factors used in this evaluation are taken from the International Commission on Radiological Protection (ICRP), which specifies 0.00041 latent cancer fatalities per person-rem for workers (ICRP, 2007). These analyses produce conservative hypothetical estimates of population impacts associated with exposure to low levels of radiation. The results of these analyses, presented below, demonstrate that the risks involved in exposure to radiation within prescribed federal limits are small for the Proposed Action and alternatives.

The estimated total occupational exposure associated with the No Action Alternative is conservatively estimated to be 0.025 rem per year per reactor plant over 15 years, for comparison with other alternatives (potential risk of 0.0012 additional latent cancer fatalities for workers).

The estimated total Shipyard occupational exposure to prepare eight reactor compartment packages for disposal at the DOE Hanford Site (Alternatives 1 and 2 [the reactor compartment packaging alternatives]) is 300 rem over five years (potential risk of 0.12 additional latent cancer fatalities for workers). The estimate for reactor compartment packages is based on scaling radiological exposure data for nuclear cruiser reactor compartment packaging and is expected to be conservative and bounding.

The estimated total occupational exposure to entirely dismantle the reactor plants (Alternative 3 [Preferred Alternative]) is 540 rem over three years (potential risk of 0.22 additional latent cancer fatalities for workers). The estimate for commercial dismantlement is based on an estimate of total expected hours to complete the radiological work applied to an average commercial dismantlement expected dose rate and is expected to be conservative and bounding.

In order to put these results into perspective, Table ES-1 compares commonplace lifetime and occupational risks for comparison to the Proposed Action and alternatives. As presented below, the risks involved in occupational radiological exposure within prescribed federal limits are low and similar to or lower than those risks involved in other occupations and in everyday life.

Table ES-1: Commonplace Lifetime and Occupational Risks

Occupational or Commonplace Risk	*Lifetime Risk Percent*
Cancer, All Causes[1]	19
Tobacco[2]	9.7
Accidents (all)[3]	4.0
Agriculture, Forestry, and Fishing[4]	1.0
Transportation and Warehousing[4]	0.6
Cancer: Alternatives 1, 2, and 3 (risk estimate)[5]	<0.3

[1](National Cancer Institute, 2021)
[2](CDC, 2011)
[3](National Center for Health Statistics, 2021)
[4](U.S. Department of Labor & U.S. Bureau of Labor Statistics, 2022)
[5] See Appendix E (Radiological Evaluation of Reactor Plant Disposal Alternatives) for detailed basis.

The results above apply to radiation exposure received by trained workers involved in the dismantling activities performed on shipyard or shipbreaking sites. Radiation exposure to the public is also assessed for transportation of radioactive materials from the shipyard or shipbreaking sites to licensed disposal facilities for all alternatives. Transportation of radioactive materials would comply with all federal limits and would represent a negligible increase in the transportation of radioactive materials that occur throughout the United States every day from commercial, medical, research, and defense work. To place exposure into perspective with normal everyday activities of the general public, a typical person in the United States receives 310 millirem of radiation exposure each year from natural background radiation (NCRP, 2009). Natural background radiation is radiation that all people receive every day from the sun or from cosmic radiation, and from the natural radioactive materials that are present in the environment, including surface rocks and soil. The collective radiation exposure to the public from transportation of radioactive materials would be negligible compared to the collective exposure from natural background radiation.

A comparison of the health risks from radiation exposure associated with the No Action Alternative, the reactor compartment packaging alternatives, and the dismantlement (preferred) alternative is provided in Table ES-2. The health risks from radiation exposure are low for all alternatives.

ES.8.2 Cumulative Impacts

The analysis in the EIS/OEIS indicates that the incremental contribution of Alternative 1, 2, or 3 would not have the potential to contribute meaningfully to any potential significant cumulative impact with respect to any of the resource areas.

Table ES-2: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative)

	No Action Alternative	Alternative 1	Alternative 2	Alternative 3 (Preferred Alternative)
Alternative Summary	Long-term waterborne storage of ex-Enterprise	Commercial partial dismantlement, (8) single reactor compartment packages, disposal at the DOE Hanford Site	Commercial partial dismantlement, (4) dual reactor compartment packages, disposal at the DOE Hanford Site	Complete commercial dismantlement, LLRW disposal at licensed LLRW waste site(s)
Navy Cost Estimate (2019 dollars – millions [M])	~$10 M per year	>$1,102 M–$1,358 M	$1,102 M–$1,358 M	$554 M–$696 M
Estimated Time for Disposal	Indefinite	>15 years (2025–2039)	15 years (2025–2039)	5 years (2025–2029)
Impact on SY Fleet Maintenance Schedule[1]	Minimal	Requires 1.561M man-days[2]	Requires 1.456M man-days[2]	N/A
Number of Radioactive Material Shipments Associated with Reactor Compartments[3]	0	8 (single reactor compartment packages)	4 (dual reactor compartment packages)	440 (CONEX boxes[4])
Required Infrastructure Improvements	No	No	Yes	No

Table ES-2: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

	No Action Alternative	Alternative 1	Alternative 2	Alternative 3 (Preferred Alternative)
Public and Occupational Health and Safety (Section 3.1)				
Additional Fatalities Occupational[5] Public[6] (Radiological) Public[7] (Non-radiological)	 0.0012 Not applicable Not applicable	 0.12 0.0000039 0.00012	 0.12 0.0000037 0.00006	 0.22 0.016 0.45
Impacts on public and occupational health and safety would be minimal, negligible, or not applicable for each alternative. See Table 3.1-4 (Summary of Impacts and Conclusions on Public and Occupational Health and Safety) for more information.				
Hazardous and Radioactive Waste Management (Section 3.2)				
Estimated total volume of hazardous waste (tons)	Not applicable	Commercial Site: 5,522 PSNS & IMF: 3,291	Commercial Site: 5,522 PSNS & IMF: 3,291	8,813
Estimated total volume of non-hazardous scrap (tons)	Not applicable	Commercial Site: 47,117 PSNS & IMF: 28,070	Commercial Site: 47,117 PSNS & IMF: 28,070	75,187
Impacts related to hazardous and radioactive wastes would be minimal, negligible, or not applicable for each alternative. See Table 3.2-2 (Summary of Impacts and Conclusions on Hazardous and Radioactive Waste Management) for more information.				
American Indian Tribal Resources and Tribal Rights (Section 3.3)				
Impacts on Tribal Resources and Tribal Rights	None	Minimal	Minimal. Impacts would be reduced through use of best management practices.	None
Impacts on Tribal Resources and Tribal Rights are minimal or not applicable for each alternative. See Table 3.3-1 (Summary of Impacts and Conclusions on American Indian Tribal Resources and Tribal Rights) for more information.				

Table ES-2: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

	No Action Alternative	Alternative 1	Alternative 2	Alternative 3 (Preferred Alternative)
Socioeconomics and Environmental Justice (Section 3.4)				
Impacts on socioeconomics	None	Minimal	Minimal	Minimal
Impacts on environmental justice	None	None	None	None
Impacts on socioeconomics and environmental justice would be minimal or not applicable for each alternative. See Table 3.4-17 (Summary of Impacts and Conclusions on Socioeconomic Resources and Environmental Justice Populations) for more information.				
Biological Resources (Section 3.5)				
In-water hull cleaning (Hampton Roads Metropolitan Area)	Not applicable	Minimal. Potential impacts on biological resources would be reduced through risk reduction measures.[8]		
Probability of vessel or tow line strike	Not applicable	Minimal. Potential impacts would be reduced through risk reduction measures.[8]		
Ship strike (heavy-lift ship)	Not applicable	Minimal.		Not applicable
Ship noise	Not applicable	Minimal.[8]		

Table ES-2: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

	No Action Alternative	Alternative 1	Alternative 2	Alternative 3 (Preferred Alternative)
Biological Resources (Section 3.5) (continued)				
Impacts from Port of Benton barge slip and the DOE Hanford Site road modification work	Not applicable	Not applicable	Impacts from Port of Benton barge slip and the DOE Hanford Site road modification work	Not applicable
Impacts from long-term storage and transport actions are unlikely, minimal (low), negligible, or not applicable for each alternative. See Table 3.5-2 (Summary of Impacts and Conclusions on Biological Resources) for more information.				
Air Quality (Section 3.6)				
Emissions of criteria air pollutants from all activities	Below *de minimis* levels	Below *de minimis* levels	Below *de minimis* levels	Below *de minimis* levels
Greenhouse gas emissions from shipping, towing, or transport (Metric Tons CO_2 equivalent)	Negligible	Minimal (55,534)[9]	Minimal (53,143)[9]	Minimal (3,854)[9]
Impacts on Air Quality resources are below *de minimis* or negligible for each alternative. See Table 3.6-23 (Summary of Impacts and Conclusions on Air Quality) for more information.				
Cultural Resources (Section 3.7)				
Impacts on known archaeological resources (or districts)	None	None	Potential impacts[10]	None
Impacts on architectural resources	None	None	Potential impacts[10]	None
Impacts on Traditional Cultural Properties	None	None	Potential impacts[10]	None
Impacts related to cultural resources are not applicable for all alternatives, except for Alternative 2. See Table 3.7-1 (Summary of Impacts and Conclusions on Cultural Resources) for more information.				

Table ES-2: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

	No Action Alternative	Alternative 1	Alternative 2	Alternative 3 (Preferred Alternative)
Noise (Section 3.8)				
Impacts on sensitive receptors (human)	No	No	Minimal. Impacts on sensitive receptors would be reduced by design, management practices, monitoring, or mitigation as necessary[10]	No
Change to community noise levels (Day-Night Levels)	No	No	Minimal impacts[10]	No
Impacts on community noise levels are minimal or negligible for each alternative. See Table 3.8-2 (Summary of Impacts and Conclusions on Noise Environment) for more information.				

Table ES-2: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

	No Action Alternative	Alternative 1	Alternative 2	Alternative 3 (Preferred Alternative)

[1]Schedule impact is determined by current and future shipyard work (in order to maintain operating nuclear-powered assets mission-ready), personnel availability (qualification and attrition), and increased cost due to delays in project schedules. Alternative 1 would require approximately 105,000 man-days of additional radiological work as compared to Alternative 2.

[2]For perspective, a notional six-month CVN Planned Incremental Availability (PIA) requires 164,500–225,000 man-days, and a notional 16-month CVN Docking Planned Incremental Availability (DPIA) requires 424,400–488,900 man-days.

[3]Indicates only waste generated from either packaging or dismantling of each reactor compartment. There are other LLRW shipments associated with dismantlement efforts, and they would be equivalent between all three action alternatives.

[4]Use of container express (CONEX) boxes would follow all federal, state, and local regulations. The number of CONEX boxes is considered bounding based on volume of the reactor compartments. This estimate does not preclude the potential for commercial vendors to ship larger packages, or multiple packages in one conveyance, meeting all applicable NRC, DOT, and DOE requirements.

[5]Potential occupational fatalities consist of onsite worker and transportation worker potential latent cancer fatalities. Occupational latent cancer fatalities are calculated by multiplying occupational exposure in rem by 0.00041 additional potential latent cancer fatalities per rem. For the No Action Alternative, a 15-year duration was used to provide comparison with other alternatives. For Alternatives 1 and 2, 300 rem collective exposure was used. For Alternative 3 (Preferred Alternative), 540 rem collective exposure was used.

[6]Public (Radiological) fatalities consist of radiation related potential latent cancer fatalities for the general population from public transportation of low-level radioactive materials, which are calculated by multiplying estimated general population exposure in rem by 0.00055 additional latent cancer fatalities per rem. The estimated number of radiological fatalities include those associated with transportation accidents, which account for less than 0.009 percent of the total for all of the alternatives.

[7]Public (non-radiological) fatalities consist of fatalities from non-radiological causes related to transportation accidents and transportation vehicle exhaust emissions.

[8]See Section 3.5 (Biological Resources) for more detail regarding the potential to impact biological resources. The Navy has consulted with both NMFS and USFWS pursuant to section 7(a)(2) of the ESA for Alternative 3 (Preferred Alternative). Accordingly, conclusions of potential effects on ESA-listed species are presented in the Alternative 3 (Preferred Alternative) analysis.

[9]Greenhouse Gas value is the total for all activities. Per year emissions would be a fraction of this value and distributed across the period of the action.

[10]Impacts on cultural and noise resources for Alternative 2 are related to construction activities at the Port of Benton barge slip and improvements between barge slip to Trench 94 at the DOE Hanford Site.

Note: PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility

ES.9 Best Management Practices and Mitigation

In addition to the potential impacts and proposed mitigations presented in the above table, the Navy lists best management practices and discusses mitigation in detail for each resource in Sections 3.1 (Public and Occupational Health and Safety) through 3.8 (Noise). If reasonably foreseeable impacts are determined to result, mitigation measures beyond best management practices would be developed and implemented.

ES.9.1 Other Considerations

ES.9.1.1 Consistency with Other Federal, State, and Local Plans, Policies and Regulations

Based on an evaluation of consistency with statutory obligations, the Proposed Action would not conflict with the objectives or requirements of federal, state, regional, or local plans, policies, or legal requirements. The Navy is coordinating and will continue to coordinate with regulatory agencies as appropriate during the NEPA process and prior to implementation of the Proposed Action to ensure all legal requirements are met.

ES.9.1.2 Relationship Between Short-Term Use of the Environment and Maintenance and Enhancement of Long-Term Productivity

In accordance with NEPA, this EIS/OEIS provides an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment (40 CFR Part 1502.16). The Proposed Action may result in both short- and long-term environmental effects. However, the Proposed Action would not be expected to result in any impacts that would reduce environmental productivity; permanently narrow the range of beneficial uses of the environment; or pose long-term risks to health, safety, or the general welfare of the public.

ES.9.1.3 Irreversible or Irretrievable Commitment of Resources

NEPA requires that environmental analysis include identification of "any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented" (42 U.S.C. Section 4332). Irreversible and irretrievable resource commitments are permanent and related to the long-term use of nonrenewable resources and resulting effects on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., petroleum-based fuels or 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., the disturbance of a cultural site, building demolition).

Implementation of the Proposed Action and alternatives would involve the consumption of fuel, oil, and lubricants for construction vehicles, and loss of natural resources. These resources are irreversible in that they would be used for this project when they could have been used for other purposes. Human labor would also be expended and is considered an irretrievable resource.

Most impacts would be short term and temporary or, if long lasting, would be negligible. Therefore, implementation of the Proposed Action would not result in major irreversible or irretrievable commitment of resources.

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Environmental Impact Statement/ Overseas Environmental Impact Statement

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants

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Appendix I **Air Quality Calculations and Record of Non-Applicability**

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Acronyms and Abbreviations

Acronym	Definition
$\mu g/m^3$	micrograms per cubic meter
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
ADDSCO	The Alabama Shipbuilding and Dry Dock Company
ADEM	Alabama Department of Environmental Management
AEA	Atomic Energy Act
AIRFA	American Indian Religious Freedom Act
AQCR	Air Quality Control Region
ARPA	Archaeological Resources Protection Act
ASPA	Alabama State Port Authority
BGEPA	Bald and Golden Eagle Protection Act
BIA	U.S. Bureau of Indian Affairs
BIH	Brazos Island Harbor
BMP	best management practice
BRMP	Biological Resources Management Plan
BRO	Brownsville/South Padre Island Airport
BSC	Brownsville Ship Channel
C	Celsius
CAA	Clean Air Act
CARB	California Air Resources Board
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CONEX	Container Express
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
CZMA	Coastal Zone Management Act
dB	decibel
dB(A)	decibels, A-weighted
DNL	day-night average sound level
DO	Dissolved Oxygen
DoD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOT	Department of Transportation
DPS	distinct population segment
EA	Environmental Assessment
ECY	Washington State Department of Ecology
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency

Acronym	Definition
ES	EnergySolutions
ESA	Endangered Species Act
ESU	evolutionarily significant unit
F	Fahrenheit
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
FR	Federal Register
ft.	feet
FY	Fiscal Year
GAO	Government Accountability Office
GRR	General Reevaluation Report
HAPC	Habitat Areas of Particular Concern
I	Interstate
INRMP	Integrated Natural Resources Management Plan
km	kilometer(s)
LBP	lead based paint
L_{eq}	equivalent sound level
LLMW	low-level mixed waste
LLRW	low-level radioactive waste
L_{max}	maximum sound level
LNG	liquified natural gas
M	Million
MARAD	Maritime Administration
MARS	Modern American Recycling & Repair Services
MBTA	Migratory Bird Treaty Act
MD	Manday
mi.	mile(s)
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
MOVES	Motor Vehicle Emission Simulator
mph	miles per hour
mrem	millirem
mrem/hr	Millirems per hour
MSW	municipal solid waste
NAAQS	National Ambient Air Quality Standards
NARA	National Archives and Records Administration
NAVBASE	Naval Base
NAVFAC	Naval Facilities Engineering Systems Command
NAVSEAINST	Naval Sea Systems Command Instruction
Navy	U.S. Department of the Navy
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
NH_3	ammonia
NHPA	National Historic Preservation Act
NIOSH	The National Institute for Occupational Safety and Health
nm	nautical mile(s)
NMFS	National Marine Fisheries Service
NNPP	Naval Nuclear Propulsion Program
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NSTM	Naval Ships' Technical Manual

Acronym	Definition
NWTT	Northwest Training and Testing
OEIS	Overseas Environmental Impact Statement
OSHA	U.S. Occupational Safety and Health Administration
Pb	Lead
PCB	polychlorinated biphenyl
PCE	primary constituent element
PDA	Preservation Designated Area
PM	particulate matter
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
PNNL	Pacific Northwest National Laboratory
PNSO	Pacific Northwest Site Office
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
PSCAA	Puget Sound Clean Air Agency
PSD	Prevention of Significant Deterioration
PSNS & IMF	Puget Sound Naval Shipyard & Intermediate Maintenance Facility
RCRA	Resource Conservation and Recovery Act
rem	Roentgen equivalent man
ROD	Record of Decision
ROI	Region of Influence
RONA	Record of Non-Applicability
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
SRS	Savannah River Site
TAC	Texas Administrative Code
TBD	to be determined
TCP	Traditional Cultural Property
TCEQ	Texas Commission of Environmental Quality
TDOT	Texas Department of Transportation
TPY	tons per year
TSCA	Toxic Substances Control Act
U&A	usual and accustomed (fishing grounds and stations)
UNDS	Uniform National Discharge Standards
U.S.	United States
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compound
WAC	Washington Administrative Code
Wanapum	Wanapum of Priest Rapids

Acronym	Definition
WCS	Waste Control Specialists
WDFW	Washington Department of Fish and Wildlife
WMP	Waste Management Procedures
Yakima Nation	Confederated Tribes and Bands of the Yakima Nation
$yd.^3$	cubic yard(s)

1 Purpose of and Need for the Proposed Action

1.1 Introduction

The United States (U.S.) Department of the Navy (Navy) prepared this Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) to evaluate the potential environmental impacts associated with disposal of the decommissioned, defueled ex-Enterprise to include its reactor plants. This EIS/OEIS was prepared in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality (CEQ) and Navy regulations. The Navy also prepared this EIS/OEIS to comply with Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*, as a portion of the Proposed Action (towing and the use of a heavy-lift ship) would occur outside the geographical borders of the United States and its territories. The Navy is the lead agency for this EIS/OEIS pursuant to 40 Code of Federal Regulations (CFR) Parts 1500–1508 (1978, as amended 1986 and 2005), and the Navy action proponent is the Director, Naval Nuclear Propulsion. The U.S. Department of Energy (DOE) is a cooperating agency pursuant to 40 CFR Parts 1501.6 and 1508.5. This EIS/OEIS complies with the CEQ regulations in 40 CFR Parts 1500–1508 (1978, as amended 1986 and 2005) because the Navy began creating this EIS/OEIS prior to the release of both the current regulations in effect May 20, 2022, and the previous regulations in effect September 14, 2020.

Ex-Enterprise, the first U.S. Navy nuclear-powered aircraft carrier, was commissioned in 1961, operated for over 50 years, and was decommissioned in 2017. Ex-Enterprise has eight reactor plants housed in four reinforced compartments inside the ship. As part of the decommissioning process, the nuclear fuel was removed from the eight reactor plants and handled in accordance with standing NEPA documents for spent naval nuclear fuel (DOE, 1995, 2016; Navy, 1994, 2009). The spent fuel resides within the DOE Idaho National Laboratory property. Ex-Enterprise is currently being stored waterborne at Newport News Shipbuilding in Newport News, Virginia.

1.2 Background

In 1984, the Navy, with DOE as a cooperating agency, prepared the *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Naval Submarine Reactor Plants*, which evaluated alternative processes for the disposal of reactor plants from various submarines (Navy & DOE, 1984). In the December 6, 1984, Record of Decision (ROD), the Navy selected a process to dispose of various submarine reactor plants by removing the reactor compartments from the submarines at Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) in Bremerton, Washington, and sealing them to provide a high-integrity welded steel package meeting Department of Transportation (DOT), Nuclear Regulatory Commission (NRC), and DOE safety requirements (Navy, 1984). Each reactor compartment package would be transported by barge to the Port of Benton barge slip in Richland, Washington, then transferred to a multiple-wheel, high-capacity transporter and hauled to Trench 94 at the DOE Hanford Site near Richland, Washington, for land disposal.

In 1996, the Navy, with DOE as a cooperating agency, prepared an EIS, *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants* to evaluate the disposal of reactor plants from cruisers, Ohio-Class submarines, and Los Angeles-Class submarines (Navy & DOE, 1996), hereafter referred to as the 1996 EIS. The Navy signed a ROD on July 3, 1996, extending the reactor compartment disposal program at PSNS & IMF to these classes of ships. The 1996 EIS updated the analysis of reactor compartment disposal from the 1984 EIS for subsequent submarine and cruiser reactor compartment disposals. As of October 2022, the

Navy has successfully shipped 140 reactor compartment packages from inactivated, defueled nuclear-powered ships using the process described above.

In 2012, the Navy, with DOE as a cooperating agency, prepared the *Final Environmental Assessment on the Disposal of Decommissioned Defueled Naval Reactor Plants from USS ENTERPRISE (CVN 65)*, for the disposal of decommissioned, defueled reactor plants from ex-Enterprise, hereafter referred to as the 2012 EA (Navy & DOE, 2012). A Finding of No Significant Impact (FONSI) was signed August 23, 2012, by the Navy and publicly released in August 2012. The 2012 EA extended the established reactor compartment disposal program at PSNS & IMF to include disposal of reactor plants from ex-Enterprise in eight single reactor compartment packages transported to the DOE Hanford Site. Remnant hull sections would be removed and recycled under an existing PSNS & IMF program, as described in the *U.S. Naval Nuclear Powered Ship Inactivation, Disposal, and Recycling Report* (Navy, 2019). This program facilitates cruiser and submarine deconstruction for reactor compartment disposal under the 1996 EIS (Navy & DOE, 1996). Each of the eight single reactor compartment packages would be similar in size and weight to the ex-Long Beach cruiser reactor compartment packages evaluated in the 1996 EIS. This process would not require substantial changes to the infrastructure at PSNS & IMF, the Port of Benton barge slip, the transport road, or Trench 94 at the DOE Hanford Site.

Subsequent to the 2012 EA, the Navy identified additional action alternatives associated with dismantling and disposal of ex-Enterprise as part of a 2014 PSNS & IMF study (Navy, 2014). The study showed the new alternatives, which packaged the reactor compartments at PSNS & IMF in fewer packages, could reduce costs and worker radiation exposure, and also improve execution schedule. Separately, the Navy identified available alternatives for dismantlement based on successful and ongoing conventional Navy aircraft carrier dismantlement by contract at commercial facilities, successful ongoing commercial nuclear power plant decommissioning by contract with nuclear services companies, and successful dismantlement of a U.S. Army barge (STURGIS) containing a defueled nuclear reactor by contract with nuclear services companies at commercial facilities. Combining these models, the Navy determined it was feasible for contracted commercial companies to disassemble the entire ex-Enterprise and its reactor plants for disposal at established waste disposal facilities.

The alternatives discussed in Chapter 2 (Description of Proposed Action and Alternatives) of this EIS/OEIS were developed based on previous analyses in the 1984 EIS, 1996 EIS, and the 2012 EA; the scoping process for this EIS/OEIS; and recent developments in the commercial naval ship dismantlement and defueled reactor plant decommissioning industries.

This EIS/OEIS includes an evaluation of reactor compartment packaging alternatives and commercial alternatives for dismantling and disposing of ex-Enterprise and its reactor plants. Potential impacts from the movement of ex-Enterprise to designated storage or disposal facilities and the transportation of low-level radioactive waste (LLRW) from dismantlement facilities to existing suitable waste facilities are analyzed in this EIS/OEIS.

1.3 Locations

The study area for this EIS/OEIS varies by alternative (described in Chapter 2, Description of Proposed Action and Alternatives) but includes Navy, other government and commercial locations (Figure 1-1), and land and water transit routes.

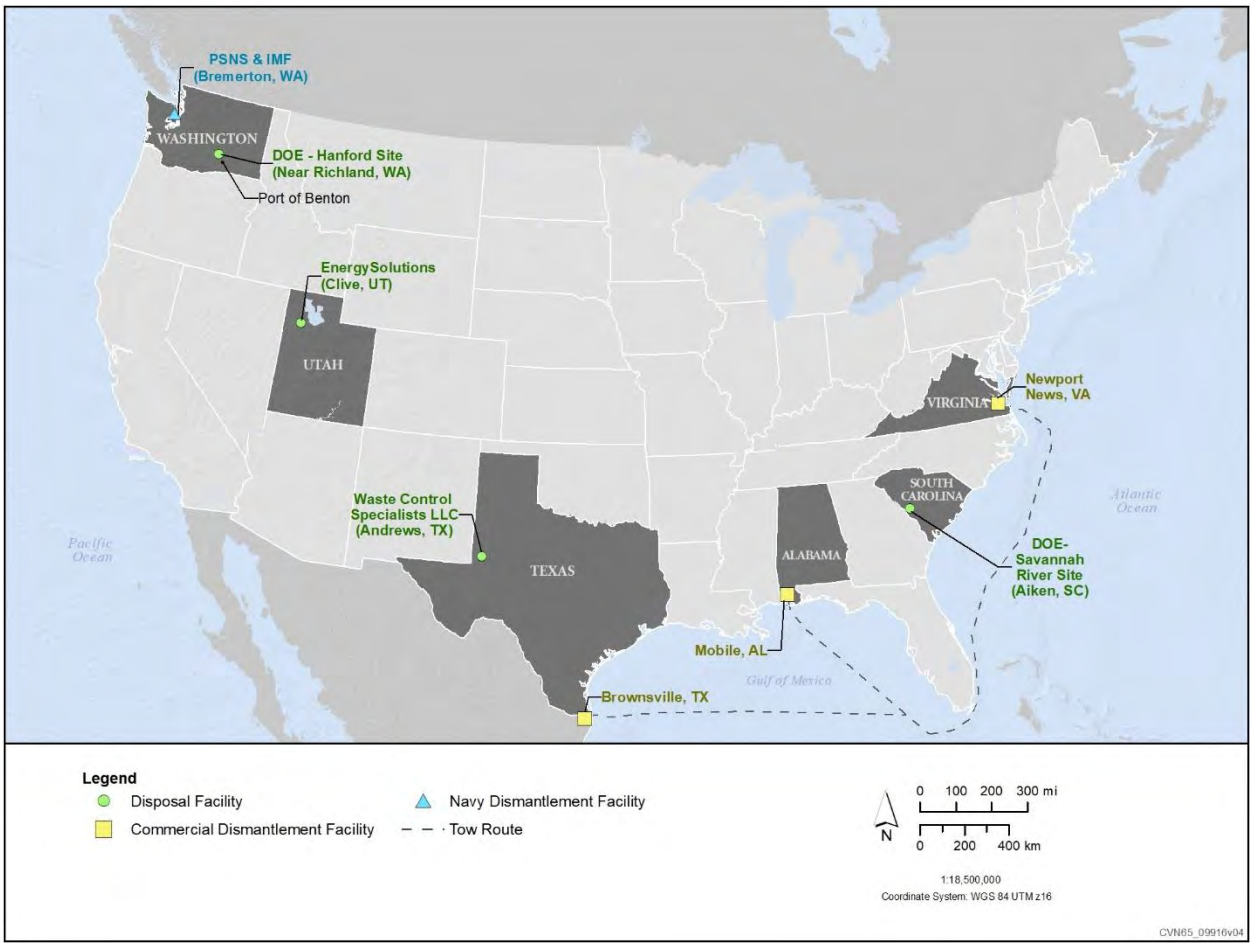


Figure 1-1: Dismantlement and LLRW Disposal Sites in the Study Area

Navy Locations:

- PSNS & IMF in Bremerton, Washington (Alternatives 1 and 2 [reactor compartment packaging alternatives])

Other Government Locations:

- Trench 94 at the DOE Hanford Site near Richland, Washington (reactor compartment packaging alternatives)
- Port of Benton barge slip in Richland, Washington (reactor compartment packaging alternatives)

Commercial Locations:

- Newport News Shipbuilding in Newport News, Virginia, where ex-Enterprise is currently stored waterborne under an agreement with the Navy (all alternatives)
- regional areas that have existing commercial industry capable of this work (Alternatives 1–3)
    a. Hampton Roads Metropolitan Area, Virginia (includes Newport News, Virginia)
    b. Brownsville, Texas
    c. Mobile, Alabama

Water Transit Routes:

- from current location of ex-Enterprise at Newport News Shipbuilding to a commercial dismantlement facility in Brownsville, Texas, or Mobile, Alabama (Alternatives 1–3); the movement of ex-Enterprise to a different facility in the Hampton Roads Metropolitan Area, Virginia, would be a local tow
- from the selected commercial dismantlement facility to PSNS & IMF (reactor compartment packaging alternatives)
- from PSNS & IMF to the Port of Benton barge slip (reactor compartment packaging alternatives)

Land Transit Routes:

- from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site (reactor compartment packaging alternatives)
- from the selected commercial dismantlement facility to one or more approved waste facilities: Waste Control Specialists, LLC in Andrews, Texas; EnergySolutions in Clive, Utah; and/or the DOE Savannah River Site in Aiken, South Carolina (Alternative 3 [Preferred Alternative])

1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to reduce the Navy inactive ship inventory, eliminate costs associated with maintaining ex-Enterprise in a safe stowage condition, and dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy.

In accordance with Office of the Chief of Naval Operations Instruction 4770.5J, General Policy for the Inactivation, Retirement, and Disposition of U.S. Naval Vessels, dismantling is the only method approved for the disposition of nuclear-powered ships stricken from the Naval Vessel Register and is required to be accomplished in the United States or its territories in accordance with existing laws and regulations. In addition, dismantling and disposing of ex-Enterprise is needed to comply with statutory responsibilities of the Naval Nuclear Propulsion Program (NNPP). The NNPP, also known as the Naval Reactors Program, was established in 1948 and is a joint DOE and Navy organization with responsibility for all matters pertaining to naval nuclear propulsion from design through disposal. The integrated relationship, authorities, and responsibilities between DOE and Navy for naval nuclear propulsion are specified in EO 12344 (*Naval Nuclear Propulsion Program*) and codified in 50 United States Code (U.S.C.) Section 2511 and 50 U.S.C. Section 2406. The mission of NNPP is to provide the United States with safe, effective, and affordable naval nuclear propulsion plants and to ensure their continued safe and reliable operation through lifetime support, research and development, design, construction, specification, certification, testing, maintenance, and disposal.

As required by CEQ regulations (40 CFR Part 1502.14) and Navy regulations (32 CFR Part 775) for implementing NEPA and EO 12114 (for transport via heavy-lift ship in international waters), the Navy must evaluate reasonable alternatives and a No Action Alternative. Alternatives for the Proposed Action must be technically and economically feasible while meeting the purpose and need and supporting the Navy mission.

1.5 Scope of Environmental Analysis

CEQ regulations for implementing NEPA (40 CFR Part 1500) provide guidance for considering alternatives to a federally Proposed Action. This guidance requires rigorous exploration and objective evaluation of reasonable alternatives.

As described in Section 2.2 (Screening Criteria) and Section 2.3 (Alternatives Carried Forward for Analysis), the Navy developed the alternatives after consideration and input by subject matter experts; cooperating agencies; tribes; and Navy environmental managers, scientists, and engineers. Additionally, the public submitted comments on the scope of the analysis, including environmental issues and potential viable alternatives, during the scoping period. The Navy considered substantive public comments submitted during the scoping process regarding potential alternatives and their impacts.

The Navy has considered what it believes are all potentially relevant environmental resource areas for analysis in this EIS/OEIS. To comply with NEPA, as well as CEQ, Navy, and DOE regulations, the discussion of the affected environment (e.g., existing conditions) focuses on those resource areas that would potentially be subject to more-than-negligible impacts as a result of the implementation of a given alternative. The level of detail describing a resource corresponds with the anticipated level of potential impact.

Describing the affected environment and analyzing impacts requires a comprehensive and systematic review of relevant literature and data to ensure the Navy uses the best available information for analysis. Each section in Chapter 3 (Affected Environment and Environmental Consequences) describes the data used and the characteristics of the best available data, and provides a general approach to analysis. Each resource section also lists the regulations applicable to that resource; discusses the affected environment and the environmental consequences of implementing the No Action and action alternatives; and summarizes potential impacts, mitigation measures, standard operating procedures, and best management practices.

The Navy assessed potential impacts on the following eight resource categories in Chapter 3 (Sections 3.1 through 3.8):

- Public and Occupational Health and Safety
- Hazardous and Radioactive Waste Management
- American Indian Tribal Resources and Tribal Rights
- Socioeconomics and Environmental Justice
- Biological Resources
- Air Quality (including greenhouse gases and climate change)
- Cultural Resources
- Noise

Resources considered but not carried forward for full analysis include water resources, geology, transportation, and infrastructure/utilities. However, potential impacts on water resources, as they relate to other resources, are addressed in the applicable sections. Water quality impacts related to the Port of Benton barge slip modifications and in-water hull cleaning are described in Section 3.5 (Biological Resources). As discussed in Section 1.6 (Key Documents) and elsewhere in this EIS/OEIS, the Navy, DOE, and the U.S. Army Corps of Engineers (USACE) have developed numerous EISs and EAs for dismantlement and disposal of various nuclear-powered ships, which identified minimal impacts on these resources given compliance with applicable federal, state, and local environmental laws and regulations.

With regards to water resources and geology, the Proposed Action and alternatives would be conducted similar to activities that have occurred in the past with little to no water or geological impacts. The Proposed Action and alternatives would comply with all applicable federal, state, and local environmental laws and regulations. The Port of Benton barge slip modifications and transport route improvements that are part of Alternative 2 would be designed and constructed in accordance with the geotechnical report for the project and applicable building and grading codes, as well as a Stormwater Pollution Prevention Plan and best management practices. Therefore, because of the historical lack of impacts, the Proposed Action and alternatives would not be anticipated to impact existing water resource or geological conditions and would not generate any new water quality or geological impacts.

Potential impacts on transportation resources (i.e., traffic and infrastructure impacts) are also not carried forward in this EIS/OEIS; however, the by-products of transportation (e.g., air emissions, noise, radiological emissions) are discussed in relevant resource sections. Waste transportation would be conducted in accordance with applicable NRC, DOT, and DOE regulations. Radioactive materials must be packaged and transported in accordance with 49 CFR Parts 100 to 177 to protect the environment, transportation workers, and the public from potential exposure to radiation. The towing of ex-Enterprise to a commercial dismantling facility from its current location would not result in shipping impacts, as it would not change the shipping lanes, nor add an unprecedented amount of traffic to shipping lanes. The heavy-lift ship transport of the propulsion space section from one of the three commercial locations to PSNS & IMF would also be considered a normal shipping activity, as would barge transportation of reactor compartment packages under the reactor compartment packaging alternatives. Any trains used to transport the container express (commonly known as CONEX) boxes would have no impacts on transportation, as use of trains for shipment of up to 440 reactor plant components and CONEX boxes would qualify as normal rail activity. All land routes proposed are currently used for trucking, and the number of vehicles added to these routes would be low and spread out over a two-and-a-half year period with negligible impact on land transportation.

Although construction involving re-grading of portions of the transport route under Alternative 2 would cause temporary impacts on local transportation from increased construction vehicle movement, construction personnel commuting to and from the sites, and delays to commuters due to roadwork on the impacted areas, the construction activities would not add an unprecedented number of cars to the local routes, and construction activities would be localized to the project sites and temporary as the impacts would cease after the completion of the construction activity.

Additionally, the Navy has concluded that impacts on infrastructure and utilities should not be carried forward in this analysis. Commercial and Navy facilities are equipped with sufficient infrastructure and utilities to complete dismantlement activities following all applicable local, state, and federal laws and regulations, including compliance with the Occupational Safety and Health Administration; Clean Air Act;

Clean Water Act; Rivers and Harbors Act; and other applicable environmental, safety, and health regulations. The Proposed Action and alternatives would result in minor energy requirements that can be accommodated by existing infrastructure and utilities at the dismantlement facilities.

For the process of determining environmental consequences, the Navy applies current resource protection measures (e.g., standard operating procedures, best management practices, conservation measures) that are integral to the activities covered by the Proposed Action and alternatives. If the analysis identifies potential adverse impacts on the resource from implementing the No Action or action alternatives, the Navy has identified methods and consulted with cooperating and coordinating agencies to minimize or mitigate those impacts, where appropriate and practical. Mitigation measures are discussed at the end of each resource section if applicable and are summarized in Section 3.9 (Summary of Potential Impacts on Resources and Impact Avoidance and Minimization).

Through the environmental impact analysis process, the Navy has identified resources that may be potentially impacted, defined the expected geographic scope for each resource, and analyzed potential impacts on those resources. The Region of Influence (ROI) is the geographic area where impacts may potentially occur. For most resources, the ROI coincides with the air, land, and water areas potentially affected by the Proposed Action. However, there are variations in the breadth of the ROI for some resource areas, with some being relatively smaller and others relatively larger.

In accordance with NEPA and the Administrative Procedure Act of 1946 (5 U.S.C. Sections 551–559), the Navy used the best available data accepted by the appropriate regulatory and scientific communities by reviewing primary literature (e.g., journals, books, periodicals, bulletins, technical reports, theses/dissertations, Department of Defense operations reports) to assist in analysis of potential environmental consequences. The Navy searched for and evaluated websites for the credibility of the source, the quality of the information, and the relevance of the content to ensure the use of high-quality information. The Navy also collected, reviewed, and evaluated additional information, such as unique resource characteristics; public and agency scoping comments; previous environmental analyses; agency and tribal consultations; resource-specific information; and applicable laws, regulations, and EOs.

The Navy considered direct and indirect effects and cumulative impacts resulting from the action alternatives. Direct effects occur in the same location and at the same time as the agency action. Indirect effects are reasonably foreseeable and caused by the action, but they occur later in time or at a distance. Cumulative analysis includes consideration of past, present, and reasonably foreseeable future actions.

The effects of the action require consideration of both context and intensity. Considering context includes analyzing the impact of an action from several perspectives, such as society as a whole (e.g., human, national), the affected region, the affected interests, and the locality. The impact varies with the setting of a Proposed Action. For instance, in the case of a site-specific action, level of impact typically depends on the effects in the locale rather than effects on a global scale. Both short- and long-term effects are relevant. Intensity refers to the severity or extent of the potential environmental impact, as well as the potential extent of the likely change. In general, the effect could be greater in a more sensitive context. Likewise, in a less sensitive context, an impact would need to be more intense to have the same level of effect.

While specific methods used to analyze the effects of the Proposed Action vary by resource, all resource analyses follow this general approach:

- Describe existing resource conditions (affected environment) based on geographic areas and/or the resource area-specific ROI. Because the Proposed Action encompasses a large area, each resource section splits the affected environment discussion into four main areas (Washington; Newport News, Virginia; Brownsville, Texas; Mobile, Alabama).
- Review existing federal, state, and local regulations and standards relevant to resource-specific management or protection.
- Identify resource conditions or areas that require specific analytical attention, such as designated critical habitat for species listed under the Endangered Species Act.
- Analyze the specific actions within a given alternative to determine which components of the alternative may affect the particular resource.
    a. Review and analyze data sources for information on the resource, including modeling efforts and scientific research.
    b. Determine specific impacts on the resource that could result from each alternative.
    c. Adjust initial impact determinations as appropriate to account for the use of standard operating procedures, best management practices, and other impact avoidance, minimization, or mitigation measures.
    d. Determine overall impacts on the resource associated with the Proposed Action and alternatives, given the applicable regulatory framework.
- Summarize findings concerning impacts on the resource.

1.6 Key Documents

There are a number of key documents that provide information to inform analyses in this EIS/OEIS. Documents are considered to be key because of similar actions, analyses, or impacts that may apply to the Proposed Action. CEQ guidance encourages incorporating documents by reference. Documents incorporated by reference in part or in whole include the following:

- *Final Environmental Assessment Decommissioning and Dismantling of STURGIS and MH-1A* (USACE, 2014)
- *Final Environmental Assessment on the Disposal of Decommissioned, Defueled Naval Reactor Plants from USS Enterprise (CVN 65)* (Navy & DOE, 2012)
- Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants (Navy & DOE, 1996)
- *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Naval Submarine Reactor Plants, Volume 1* (Navy & DOE, 1984)

1.6.1 2014 Environmental Assessment Decommissioning and Dismantling of STURGIS and MH-1A

The USACE prepared this EA to evaluate the potential environmental consequences of the proposed decommissioning and dismantling of a U.S. Army barge (STURGIS) containing a defueled nuclear reactor and associated mobile nuclear high power plant MH-1A. Decommissioning and dismantling locations were screened, and the sites determined to be the most feasible were evaluated as Proposed Action Alternatives. There were four Proposed Action Alternative locations for which environmental effects

were evaluated: Hampton Roads Metropolitan Area, Virginia; Baltimore, Maryland; Charleston, South Carolina; Galveston, Texas; and Brownsville, Texas. Because STURGIS was towed to a commercial industrial facility that has restricted access, the Proposed Action presented no risk to many resource areas; only six resources (cultural, biological, water, health and safety, air quality, and waste management) were analyzed in detail. This EA determined that implementation of any of the Proposed Action Alternatives or the No Action Alternative would not result in significant impacts on any resource area, and the FONSI was signed in April 2014.

1.6.2 2012 Final Environmental Assessment on the Disposal of Decommissioned, Defueled Naval Reactor Plants from USS Enterprise (CVN 65)

The Navy evaluated the potential environmental effects of removing the reactor compartments from ex-Enterprise at PSNS & IMF, preparing the reactor compartments for disposal as eight reactor compartment packages, recycling the remnant hull sections, and transporting the reactor compartment packages for disposal to Trench 94 at the DOE Hanford Site (Navy & DOE, 2012). The FONSI for the 2012 EA, signed August 23, 2012, stated the preferred alternative would have a negligible incremental effect on the environment surrounding PSNS & IMF, the transport route, and at the DOE Hanford Site (Navy, 2012). Accomplishment of the preferred alternative would have resulted in total and peak workloads that could be accommodated by the available workforce capacity. This work was expected to be performed within available resources (e.g., manpower, facilities) and existing permitted discharges of PSNS & IMF. Operations at PSNS & IMF, an industrial naval shipyard, were considered to be consistent to the maximum extent practicable with local and state shoreline management requirements and the Coastal Zone Management Act.

1.6.3 1996 Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio-Class, and Los Angeles-Class Naval Reactor Plants

The Navy analyzed alternative options for disposing of decommissioned, defueled reactor compartments from Navy nuclear-powered ships (USS Bainbridge, USS Truxtun, USS Long Beach, California and Virginia-Class) and submarines (Los Angeles- and Ohio-Class) (Navy & DOE, 1996). The alternatives examined in detail were (1) Preferred Alternative — shipment of the prepared compartments from PSNS & IMF in Bremerton, Washington for land disposal of the entire reactor compartment at Trench 94 at the DOE Hanford Site, Washington; (2) the No Action Alternative — protective waterborne storage for an indefinite period; (3) disposal and reuse of subdivided portions of the reactor compartments; and (4) indefinite storage above ground at the DOE Hanford Site.

Under the Preferred Alternative, the Navy proposed to prepare defueled reactor compartments for shipment at PSNS & IMF. Preparations involved draining the piping systems, tanks, vessels, and other components to the maximum extent practical; sealing radioactive systems; removing the reactor compartment; and enclosing it in a high-integrity, all-welded steel package. The reactor compartment packages would meet applicable DOT, NRC, and DOE Type B Packages requirements. Nonradioactive metal, such as submarine hulls, were proposed to be recycled. Each reactor compartment package would be transported by barge out of Puget Sound through the Strait of Juan de Fuca, south along the Washington coast, and up the Columbia River to the Port of Benton barge slip, where they would be loaded onto a multiple-wheel, high-capacity transporter and hauled to the DOE Hanford Site near Richland, Washington.

The 1996 EIS included updates to the analysis of reactor compartment disposal from the 1984 EIS and is the standing EIS for submarine and cruiser reactor compartment disposal. The conservative engineering

practices described in the 1984 EIS were incorporated into the Preferred Alternative for nuclear-powered ships, Ohio-Class submarines, and Los Angeles-Class submarines. All practical means to avoid or minimize environmental impacts from the Preferred Alternative were adopted, and no additional mitigation measures were necessary.

The Navy signed the ROD on July 3, 1996, with the concurrence of DOE, and decided to proceed with the Preferred Alternative to bury defueled reactor compartments at the DOE Hanford Site because this alternative was the environmentally preferable alternative; it supported the Navy mission by providing for responsible, permanent disposal of the defueled reactor plants from the nuclear-powered ships, reduced radiation exposure to the workforce and public, and could be implemented safely and at reasonable cost (Navy, 1996).

1.6.4 1984 Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Naval Submarine Reactor Plants

The 1984 EIS included the evaluation of three methods the Navy and DOE considered for disposing of nuclear-powered submarines (Navy & DOE, 1984). The three alternatives evaluated were (1) bury the reactor compartment at the existing DOE Hanford Site or at the DOE Savannah River Plant in South Carolina, and dispose of the non-radioactive portions by sinking at sea or by cutting up for sale as scrap metal; (2) place the entire submarine on the bottom of the ocean in deep water (deeper than 2.5 miles) far from the U.S. coast; or (3) keep the submarine in protective storage at a Navy inactive ship facility after decommissioning for disposal on land or at sea at a later time.

An environmental impact assessment of the disposal site area was performed. The Navy considered permanent disposal to be environmentally safe and feasible using either land disposal or deep ocean options. The Navy used highly conservative estimates in the analyses of impacts, which compensated for any uncertainties for either disposal option. The Navy ultimately decided to proceed with disposal of the reactor compartments by land disposal. Land disposal is the method currently used in the United States for disposal of LLRW and complies with existing requirements for use of the disposal site. The Navy decided that disposal of LLRW at the DOE Hanford Site would be environmentally safe and could proceed with no unacceptable environmental impacts (Navy, 1984). The Navy signed the ROD on November 30, 1984, and it was published on December 6, 1984.

1.7 Relevant Laws, Regulations, and Policies

The Navy prepared this EIS/OEIS based on pertinent federal, state, and local statutes, regulations, and policies for the implementation of the Proposed Action, including but not limited to the following:

- NEPA (42 U.S.C. Sections 4321–4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500–1508)
- Navy regulations for implementing NEPA (32 CFR Part 775), which provides Navy policy for implementing CEQ regulations and NEPA
- Archaeological Resources Protection Act of 1979 (16 U.S.C. Sections 470aa–470mm)
- Atomic Energy Act (42 U.S.C. Sections 2011–2259)
- Bald and Golden Eagle Protection Act (16 U.S.C. Sections 668–668c)

- Clean Air Act (42 U.S.C. Section 7401 et seq.)
- Clean Water Act (33 U.S.C. Section 1251 et seq.)
- Coastal Zone Management Act (16 U.S.C. Section 1451 et seq.)
- Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. Section 9601 et seq.)
- Dredged Material Management Requirements
- Emergency Planning and Community Right-to-Know Act (EPCRA) (42 U.S.C. Section 11001 et seq.)
- Endangered Species Act (16 U.S.C. Section 1531 et seq.)
- Hazardous Materials Transportation Act of 1975 (49 U.S.C. Section 5101 et seq.)
- Low-Level Radioactive Waste Policy Amendments Act of 1985 (42 U.S.C. Sections 2021b-j)
- Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. Section 1801 et seq.)
- Marine Mammal Protection Act (16 U.S.C. Section 1361 et seq.)
- Migratory Bird Treaty Act (16 U.S.C. Sections 703–712)
- National Historic Preservation Act (54 U.S.C. Section 300101 et seq.)
- National Marine Sanctuaries Act (16 U.S.C. Section 1431 et seq.)
- Native American Graves Protection and Repatriation Act (25 U.S.C. Section 3001-3013)
- Occupational Safety and Health Act of 1970; Occupational Safety and Health Administration OSHA Regulations in 29 CFR Part 1926, Subpart P; 10 CFR Part 851; and DOE G 450.4-1C Integrated Safety Management Guide
- Packaging and Transportation of Radioactive Material (10 CFR Part 71 and 49 CFR Parts 171 to 177)
- Protection of Historic Properties; the implementing regulations for Section 106 of the National Historic Preservation Act (36 CFR Part 800)
- Puget Sound Partnership Action Agenda
- Resource Conservation and Recovery Act (42 U.S.C. Section 6901 et seq.)
- Rivers and Harbors Act (33 U.S.C. Section 401 et seq.)
- Standards for Protection Against Radiation (10 CFR Part 20)
- Toxic Substances Control Act (15 U.S.C. Sections 2601–2629)
- Washington State Building Code
- EOs for Invasive Species: EO 11987, Exotic Organisms; EO 13112, Invasive Species; and EO 13751, Safeguarding the Nation from Impacts of Invasive Species
- EO 11988, Floodplain Management

- EO 11990, Protection of Wetlands
- EO 12088, Federal Compliance with Pollution Control Standards
- EO 12114, Environmental Effects Abroad of Major Federal Actions
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (amended by EO 14008, Tackling the Climate Crisis at Home and Abroad)
- EO 13007, Indian Sacred Sites
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13175, Consultation and Coordination with Indian Tribal Governments
- EO 13840, Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States
- EO 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis (revoked EO 13783, Promoting Energy Independence and Economic Growth; revoked EO 13792, Review of Designations Under the Antiquities Act; revoked EO 13807, Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects; and revoked, in part, EO 13834, Efficient Federal Operations)
- EO 14008, Tackling the Climate Crisis at Home and Abroad

Chapter 5 (Other Considerations Required by NEPA, Table 5-1) presents a description of the consistency of the Proposed Action with these laws, regulations, and policies and the regulatory agencies responsible for their implementation.

Agency consultations for Alternative 3 (Preferred Alternative) occurred in parallel with development of the Final EIS/OEIS, and consultation outcomes are documented in this EIS/OEIS. The Navy has been engaging agencies and tribes as applicable during development of the Draft and Final EIS/OEIS.

1.8 Public and Agency Participation and Intergovernmental Coordination

The Navy is committed to facilitating public and agency participation and input to ensure a complete environmental analysis and to make informed decisions. Public input and involvement are fundamental aspects of the NEPA process. The NEPA process requires public involvement during the "scoping" period and when the Draft EIS/OEIS is available for public review and comment. The public participates in the NEPA process during the following key stages:

- Scoping Period: The public can help the federal agency identify the scope of the EIS/OEIS, viable alternatives, and specific environmental topics for consideration in the analysis.
- Draft EIS/OEIS Public Review and Comment Period: The public can review, evaluate, and comment on the environmental impact analysis.
- Final EIS/OEIS 30-Day Wait Period: The public can review how the federal agency responded to public comments on the Draft EIS/OEIS.

A Notice of Intent to prepare an EIS/OEIS was published in the Federal Register (FR) on May 31, 2019. The FR notice can be found in Appendix A (Federal Register Notices). The public involvement and

stakeholder outreach efforts throughout the course of the NEPA process are documented in Appendix B (Public Involvement and Distribution).

The Notice of Intent provided information about the Proposed Action, purpose and need, and alternatives. The Notice of Intent also announced the 45-day public scoping period; the dates, times, and locations of public scoping meetings; and instructions for submitting public scoping comments. Display advertisements were published in 11 local and regional newspapers (Virginia-Pilot, Daily Press [Norfolk, Virginia], Augusta Chronicle, Aiken Standard, Brownsville Herald, El Nuevo Heraldo [Brownsville, Texas], Seattle Times, Kitsap Sun, Tri-City Herald [Kennewick, Pasco, and Richland, Washington], Oregonian, and Portland Tribune) a total of 54 times from May 31, 2019, through June 23, 2019. The first series of advertisements was published to coincide with the publication of the Notice of Intent. A second series was published 10 days before the public scoping meetings, and a third series was published two to five days before the public scoping meetings. A Spanish version of the advertisement was published in a Spanish-language newspaper (El Nuevo Heraldo). Adjustments were made according to the publication frequency (e.g., daily, semi-weekly, weekly) of the newspapers. Comments were solicited during the scoping period from May 31 to July 15, 2019, from Federal, state, and local agencies; federally recognized tribes; non-governmental organizations; and interested persons on potential impacts on environmental resources and to help identify public concerns and local issues to be considered during the development of the EIS/OEIS.

As a result of comments received during public scoping conducted in 2019, the Navy added the Mobile, Alabama, area to the Study Area and as an additional location considered in the alternatives section for the EIS/OEIS. In compliance with NEPA, the Navy held an additional public scoping period from August 12, 2020, through September 11, 2020, to solicit comments from federal, state, and local agencies; federally recognized tribes; non-governmental organizations; and interested persons. Display advertisements were published three times in the regional newspaper in Mobile, Alabama (Mobile Press-Register), and the Navy sent out letters, postcards, emails, and a news release to notify the public agencies and other stakeholders of the reopened scoping period. Project information, including an updated fact sheet booklet and poster displays, were posted on the project website. All recipients of a stakeholder or tribal letter also received a copy of the fact sheet booklet. Due to federal and state guidance and measures in response to the coronavirus disease of 2019 (COVID-19), the Navy was unable to hold an in-person public scoping meeting in Mobile, Alabama. The public was able to submit questions about the project to info@CarrierDisposalEIS.com. The Navy designated the PSNS & IMF Congressional and Public Affairs Office to receive public questions. All questions were responded to in a timely manner. The public was also able to submit comments by mail or the project website during the 30-day scoping period. The Navy received 120 comments from the public during the 2019 public scoping phase and 34 comments during the 2020 public scoping phase. Of those, 1 comment was received from tribes, 4 from federal agencies, 10 from state and local agencies, 5 from non-governmental organizations, and 134 from the public. Appendix B (Public Involvement and Distribution) contains a brief description of the comments received during both scoping periods.

The Navy has prepared this Final EIS/OEIS to analyze the potential environmental impacts of alternatives that would meet the purpose of and need for the Proposed Action, and respond to public review comments. The 45-day public review and comment period for the Draft EIS/OEIS began with the publication of the Notice of Availability and Notice of Virtual Public Meetings in the FR (87 FR 51068) on August 19, 2022. The Navy determined that virtual public meetings were the best format to meet statutory requirements under NEPA while mitigating COVID-19 risks. The public review and comment period for the Draft EIS/OEIS ran from August 19, 2022, to October 3, 2022. The FR notice included

notification of availability of the Draft EIS/OEIS and where it could be accessed; an overview of the Proposed Action and alternatives; its purpose and need; virtual public meeting information, including how to submit questions; and public commenting information. The Navy also published advertisements in 14 newspapers (The Seattle Times, The Kitsap Sun, Tri-City Herald, Tu Decides [Spanish], The Oregonian, The Portland Tribune, El Latino de Hoy [Spanish], The Virginian-Pilot, The Daily Press, Tidewater Hispanic News [Spanish], Brownsville Herald, Brownsville Herald [Spanish, online only], Mobile Press Register, Latino News [Spanish]), which included a brief description of the Proposed Action; the virtual public meeting dates and times, including when and how to submit a question; the project website address; the duration of the comment period; and information on how to provide comments. Public comments were accepted by mail and via the project website at www.carrierdisposaleis.com. Tribal letters were mailed via U.S. Priority Mail or FedEx on August 18, 2022, to 70 tribal leaders of federally recognized tribes. All tribal letter recipients received a CD-ROM of the Draft EIS/OEIS. Stakeholder letters were sent August 16–18, 2022, to 411 federal, state, and local elected officials; government agencies; and non-federally recognized tribes. A Spanish version of the stakeholder letter was included for local elected officials in Texas. All stakeholder letter recipients received a CD-ROM of the Draft EIS/OEIS. Additionally, copies of the Draft EIS/OEIS were made available for public review at six regional information repositories (Kitsap Regional Library, Richland Public Library, Hampton Public Library, Brownsville Public Library [Main and Southmost Branches], and Ben May Main Library). PSNS & IMF distributed a news release to local, regional, and national print and broadcast (radio and television) media outlets to coincide with the release of the Notice of Availability and Notice of Virtual Public Meetings on August 19, 2022. A second news release and a public service announcement were distributed to media outlets on September 14, 2022, prior to the virtual public meetings. English and Spanish versions of the news releases were distributed to all media outlets. The FR notice can be found in Appendix A (Federal Register Notices). Details regarding the public comment period for the Draft EIS/OEIS are available in Appendix B (Public Involvement and Distribution).

The Navy held two virtual public meetings, on September 20, 2022, and September 22, 2022. Interested individuals could attend a virtual public meeting by computer, tablet, mobile device, or telephone. The virtual public meetings consisted of a slide presentation, prepared remarks interpreted into Spanish, and a question-and-answer session to discuss the Proposed Action and the draft environmental impact analysis. A Spanish-language interpreter was available at each virtual public meeting to translate portions of the presentation, such as how to provide questions during the virtual public meeting, and any questions received during the question-and-answer session. The Navy received 45 comments from the public during the public review and comment period. Of those, 1 comment was received from federal agencies, 1 from tribes, 6 from state and local agencies, 5 from non-governmental organizations, and 32 from the public. The Navy considered comments received from the public comment period in the development of this Final EIS/OEIS. Public comments received and responses to comments can be found in Appendix C (Public Comments and Responses).

The Environmental Protection Agency will publish a Notice of Availability of the Final EIS/OEIS in the FR to start the 30-day wait period and inform the public of the release of the Final EIS/OEIS. New substantive comments received during the 30-day wait period for the Final EIS/OEIS will be addressed in the ROD. The ROD will be prepared following the wait period. The ROD will state the decision made, identify alternatives considered, address new substantive comments received on the Final EIS/OEIS that were not previously addressed in the Draft EIS/OEIS, identify the environmentally preferred alternative and address mitigation, if needed. Following the signing of the ROD, the Navy will publish a Notice of Availability of the ROD in the FR.

1.8.1 Cooperating and Coordinating Agencies

A cooperating agency is any agency, other than the lead agency, which has jurisdiction by law or special expertise concerning an environmental impact involved in a proposal. DOE is a cooperating agency on this EIS/OEIS.

The Navy has also consulted with other government agencies with regulatory authority or special expertise with respect to reasonable alternatives or significant environmental, cultural, social, or economic impacts associated with the action. Consultation coordination documents are provided in Appendix D (Consultation Correspondence).

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2 Description of Proposed Action and Alternatives

This chapter provides detailed information on the Proposed Action and alternatives analyzed in this Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) prepared under the National Environmental Policy Act (NEPA) and Executive Order 12114.

2.1 Proposed Action

The Proposed Action of the United States (U.S.) Department of the Navy (Navy) is to dispose of ex-Enterprise, including its reactor plants. The nuclear fuel was removed from ex-Enterprise and shipped to the Department of Energy (DOE) Idaho National Laboratory in 2017. Ex-Enterprise is currently in waterborne storage at Newport News Shipbuilding in Newport News, Virginia. Disposal includes the following steps: (1) dismantling and recycling the non-radioactive remnant hull sections of the aircraft carrier at a government or authorized commercial facility in accordance with applicable federal, state, and local laws; and (2) removing and packaging reactor plant components for transportation and disposal as low-level radioactive waste (LLRW) to an authorized radioactive waste facility or facilities. The action proponent of the Navy is the Director, Naval Nuclear Propulsion Program (NNPP). DOE is a cooperating agency in the preparation of this EIS/OEIS as the regulatory authority for management and disposal of applicable wastes analyzed under this action.

2.2 Screening Criteria

Screening criteria were developed to identify reasonable alternatives based on the purpose of and need for the Proposed Action.

For an alternative to be considered reasonable, it must do the following:

- meet Office of the Chief of Naval Operations Instruction 4770.5J, *General Policy for the Inactivation, Retirement, and Disposition of U.S. Naval Vessels*, for inactive ships removed from the Naval Vessel Register; and
- reduce the use of public nuclear-powered ship maintenance infrastructure for dismantlement and disposal of non-radioactive portions of the ship to prioritize the limited public shipyard infrastructure and workforce for active fleet maintenance.

For an alternative to be considered reasonable, the location or facility in which partial or complete dismantlement is performed must also meet the following criteria:

- be located in the United States and work completed by U.S. citizens in accordance with U.S. regulation and policy derived from the Atomic Energy Act and Arms Export Control Act; and
- have no limitations for work with radioactive material that would prevent removal of radioactive material from ex-Enterprise and shipping LLRW and low-level mixed waste to an existing waste facility.

2.3 Alternatives Carried Forward for Analysis

The identification, consideration, and analysis of alternatives are critical components of NEPA and Executive Order 12114 processes and contribute to the goal of making informed decisions from an environmental standpoint while meeting the purpose and need. The Council on Environmental Quality requires and provides guidance on the development of alternatives. Decision makers are required to consider the environmental effects of the Proposed Action and a reasonable range of alternatives, including a No Action Alternative. Guidance further states an EIS must rigorously and objectively explore

all reasonable alternatives for implementing the Proposed Action and, for alternatives eliminated from detailed study, briefly discuss the reasons for eliminating from further consideration. With the exception of the No Action Alternative, an alternative must meet the stated purpose and need for the Proposed Action in order to be reasonable.

A No Action Alternative, in which the ship is stored waterborne, and three reasonable action alternatives were carried forward for analysis. These alternatives are described in detail in Section 2.3.1 (No Action Alternative), Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages), Section 2.3.3 (Alternative 2 – Dual Reactor Compartment Packages), and Section 2.3.4 (Alternative 3 [Preferred Alternative] – Commercial Dismantlement). The activity components of these No Action and action alternatives are shown in Table 2-1. All action alternatives and locations analyzed meet the selection criteria due to the reasons listed below.

- include dismantlement and recycling as a disposal method for ex-Enterprise in accordance with Office of the Chief of Naval Operations Instruction 4770.5J
- reduce use of public nuclear-powered ship maintenance infrastructure for dismantlement and disposal of non-radioactive portions of the ship
    - Alternatives 1 and 2 (the reactor compartment packaging alternatives): include performing partial dismantlement efforts at a commercial ship dismantlement facility
    - Alternative 3 (Preferred Alternative): includes performing all dismantlement efforts at a commercial ship dismantlement facility
- partial or complete dismantlement work occurs in the United States
- partial or complete dismantlement work facilities have no limitations for work with radioactive material that would prevent removal of radioactive material from ex-Enterprise and shipping LLRW and low-level mixed waste to an existing disposal facility

Table 2-1: Activity Components per Alternative

Region of Influence (Based on Activity)	No Action Alternative	Alternative 1	Alternative 2	Alternative 3 (Preferred Alternative)
Ex-Enterprise is stored waterborne at Newport News Shipbuilding in Newport News, Virginia	✓			
Tow ex-Enterprise from Newport News Shipbuilding to commercial dismantlement facility		✓	✓	✓
Partial dismantlement at commercial facility (includes in-water activities)		✓	✓	
Complete dismantlement at commercial facility				✓
Transport waste and recyclable materials from commercial dismantlement facility to an approved waste or recycling facility		✓	✓	✓
Ship ex-Enterprise propulsion space section via heavy-lift ship from commercial dismantlement facility to PSNS & IMF (following route around South America)		✓	✓	
Work at PSNS & IMF – Eight single reactor compartment packages (no in-water work)		✓		

Table 2-1: Activity Components per Alternative (continued)

Region of Influence (Based on Activity)	No Action Alternative	Alternative 1	Alternative 2	Alternative 3 (Preferred Alternative)
Work at PSNS & IMF – Four dual reactor compartment packages (no in-water work)			✓	
Port of Benton barge slip modifications			✓	
Road improvements between Port of Benton barge slip and Trench 94 at the DOE Hanford Site			✓	
Install rail system for reactor compartment packages in Trench 94 at the DOE Hanford Site		✓	✓	
Barge transport of reactor compartment packages from PSNS & IMF to Port of Benton barge slip		✓	✓	
Land transport of reactor compartment packages from Port of Benton barge slip to Trench 94 at the DOE Hanford Site		✓	✓	

Notes: DOE = Department of Energy; PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility

Alternatives 1 and 2 (the reactor compartment packaging alternatives) would involve partial dismantlement of the ship at a commercial dismantlement facility by removing non-radiologically controlled areas of the ship outside of the reactor plants. The remainder of the ship containing the reactor plants and radiologically controlled systems (the propulsion space section) would be transported by heavy-lift ship around South America to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) for the completion of recycling, construction of either eight (Alternative 1) or four (Alternative 2) reactor compartment packages, and shipment by barge and multiple-wheel, high-capacity transporter to the DOE Hanford Site in Richland, Washington, for final disposal. Under Alternative 3 (Preferred Alternative), the Navy would contract with commercial industry (in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama) to dismantle ex-Enterprise, including its reactor plants, and dispose of the reactor plant components in several hundred shipments to an authorized LLRW site. All action alternatives would be required to follow all applicable federal, state and local environmental regulations. The Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; and Mobile, Alabama, locations are being evaluated as potential commercial dismantlement facilities based on market research performed by the Navy in this EIS/OEIS. Figure 2-1 shows the potential partial or complete dismantlement locations as well as the potential LLRW disposal facilities.

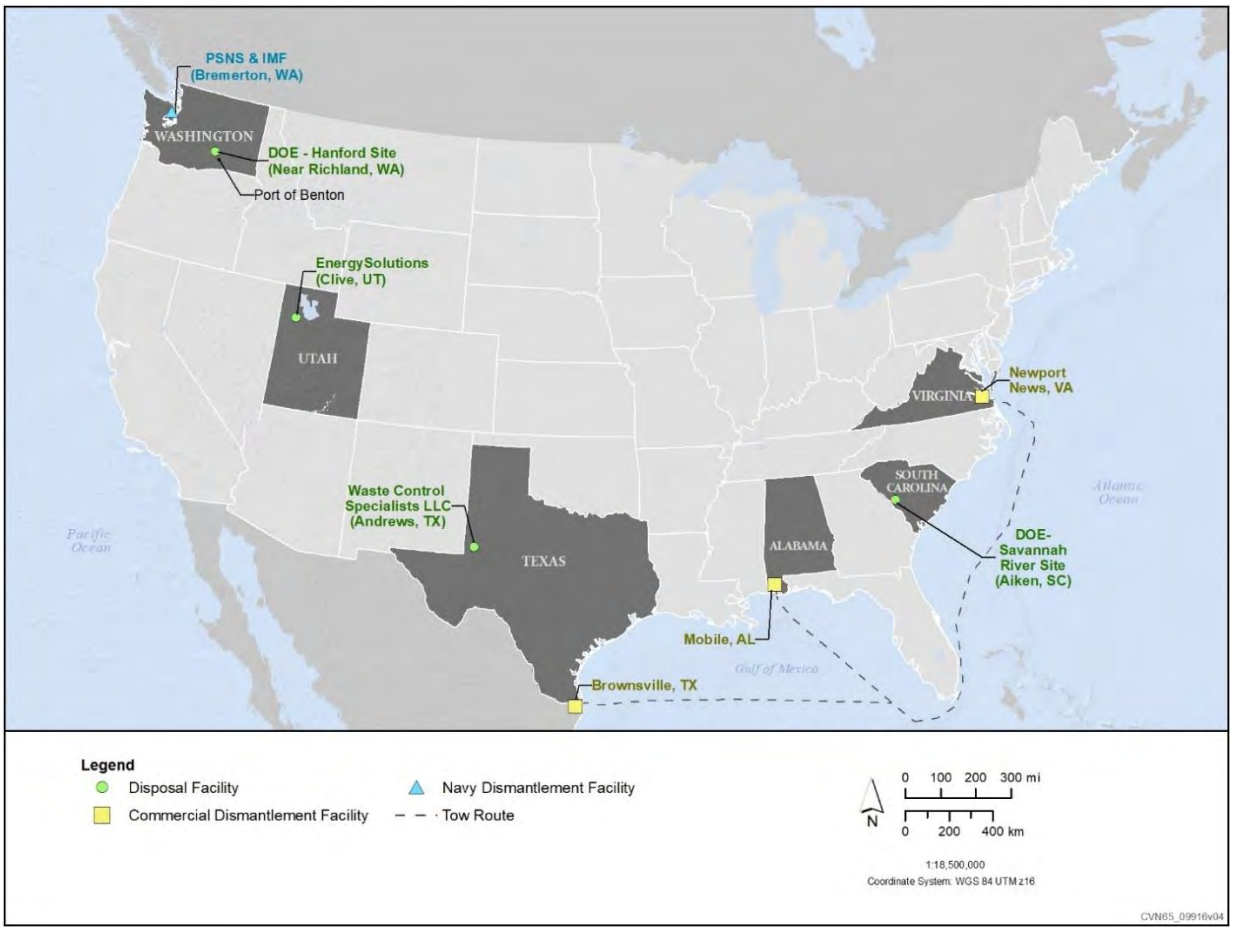


Figure 2-1: Potential LLRW Disposal Facilities and Tow Routes

Table 2-2 presents the anticipated duration and cost estimate for each alternative.

Table 2-2: Duration and Cost Estimate per Alternative

	No Action Alternative	Alternative 1	Alternative 2	Alternative 3 (Preferred Alternative)
General Information	Long-term waterborne storage of ex-Enterprise (CVN 65)	Commercial partial dismantlement, (8) single reactor compartment packages, disposal at the DOE Hanford Site	Commercial partial dismantlement, (4) dual reactor compartment packages, disposal at the DOE Hanford Site	Complete commercial dismantlement, LLRW disposal at licensed LLRW waste site(s)
Navy Cost Estimate (2019 dollars – millions [M])	~$10 M per year	>$1,102 M–$1,358 M	$1,102 M–$1,358 M	$554 M–$696 M
Estimated Time for Disposal	Indefinite	>15 years (2025–2039+)	15 years (2025–2039)	5 years (2025–2029)

Notes: DOE = Department of Energy, LLRW = low-level radioactive waste

2.3.1 No Action Alternative

The Council on Environmental Quality regulations for implementing the NEPA require inclusion of a No Action Alternative and analysis of reasonable alternatives for comparison purposes to provide a clear basis for choice among options by the Record of Decision. Under the No Action Alternative, ex-Enterprise would not be dismantled or disposed of, but rather remain in waterborne storage for an indefinite time period at its current location in Newport News Shipbuilding in Newport News, Virginia (Figure 2-2). This would require periodic maintenance to ensure that storage continues in a safe and environmentally acceptable manner.

Ship preparations for storage would include installing fire and flood alarm systems, a corrosion prevention system (impressed current cathodic protection), and dehumidification systems. Storage facility staff would perform periodic inspections and maintenance of the ship while in storage, to include a detailed interior inspection annually, an underwater exterior inspection of the hull after every eight years in waterborne storage, and placing the ship in dry dock for inspection and repair after every 15 years in waterborne storage.

The No Action Alternative only delays the ultimate permanent disposal of ex-Enterprise, as dismantlement is required by Navy policy. Waterborne storage is not a permanent solution and is considered satisfactory only as an interim measure. Though expected to cost approximately $10 million per year for this alternative, maintenance and costs would increase as ex-Enterprise ages and the hull deteriorates, requiring repairs to ensure watertight integrity.



Figure 2-2: Current Location of ex-Enterprise in Newport News Shipbuilding in Newport News, Virginia

2.3.2 Alternative 1 – Single Reactor Compartment Packages

Alternative 1 is an extension of the reactor plant disposal program at PSNS & IMF, and is similar to the alternative discussed in the 2012 *Final Environmental Assessment on the Disposal of Decommissioned, Defueled Naval Reactor Plants from USS Enterprise (CVN 65)* (Navy & DOE, 2012), hereafter referred to as the 2012 EA. This alternative would include towing ex-Enterprise to an authorized commercial dismantlement facility in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama, for partial dismantlement of ex-Enterprise, reducing the use of public nuclear-powered ship maintenance infrastructure from what was analyzed in the 2012 EA (see Figure 2-1). Partial dismantlement includes removing areas of the ship outside of reactor compartments, installing watertight bulkheads, and leaving a propulsion space section (about one-third of the original weight and length of the aircraft carrier) (Figure 2-3). Partial dismantlement is expected to take approximately 18 months.

The propulsion space section, which contains the eight defueled reactor plants, would then be transported to PSNS & IMF in Washington (Figure 2-4) around the southern tip of South America (Figure 2-5) by heavy-lift ship (instead of in-water tow) for processing and disposal. The heavy-lift ship would need to be semi-submersible so it can lower its deck below the level of the buoyant propulsion space section before emptying its ballast tank and rising back above water, with the propulsion space section on its deck.

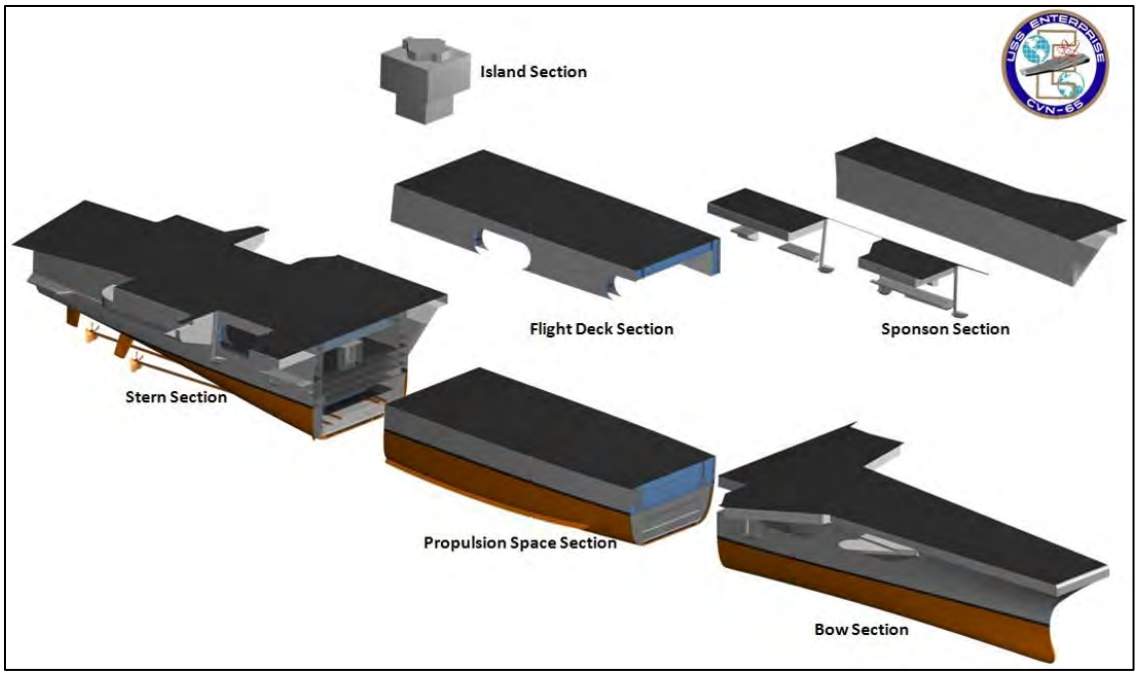


Figure 2-3: Sections of ex-Enterprise



Figure 2-4: Puget Sound Naval Shipyard & Intermediate Maintenance Facility in Bremerton, Washington

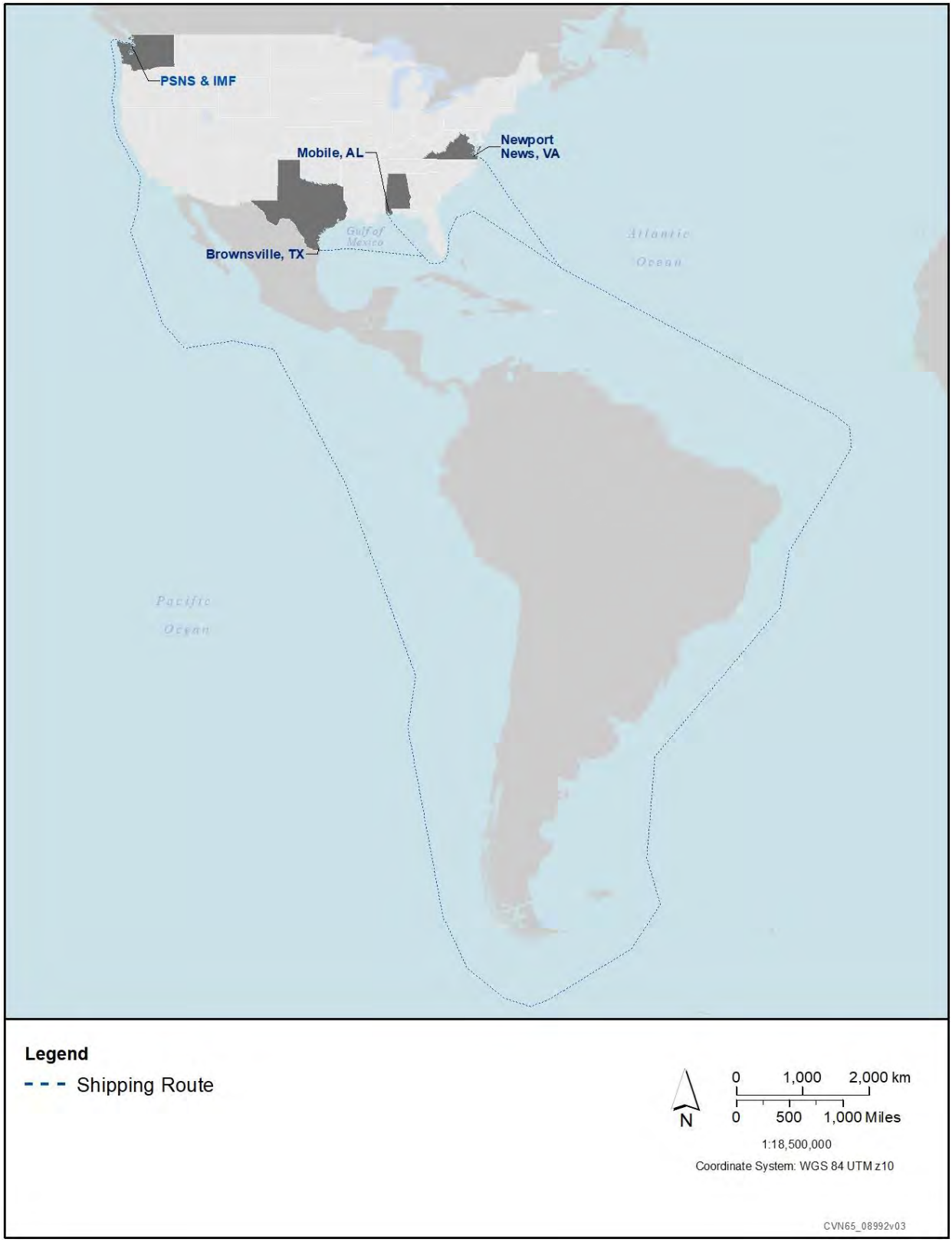


Figure 2-5: Proposed Heavy-Lift Ship Routes

Once at PSNS & IMF, qualified shipyard personnel would construct eight single reactor compartment packages for disposal at the DOE Hanford Site, following the established Navy program. Reactor compartment packages (Type B packages as defined by the Nuclear Regulatory Commission [NRC] in 10 Code of Federal Regulations [CFR] Part 71.4) are constructed from heavy steel, welded to meet stringent integrity requirements, and meet all applicable federal requirements for transportation of radiological material.

Reactor compartment packages built at PSNS & IMF would be transported by barge via the current program transport route to the Port of Benton barge slip in Richland, Washington, where each package would then be loaded onto a multiple-wheel, high-capacity transporter and hauled to Trench 94 at the DOE Hanford Site (Figure 2-6). This facility is designated for Navy use for sequestered burial of reactor compartment packages. For this alternative, there would be one reactor plant per package, for a total of eight single reactor compartment packages. Temporary docking aids would be required at PSNS & IMF, which would primarily be a guiding system of rollers temporarily installed on the dry dock walls and on the inlet-facing walls on both sides of the dry dock opening. No in-water work would be required, and the structures would be removed after reactor compartment packaging and recycle is complete. LLRW and low-level mixed waste not contained in the reactor compartment packages would be disposed of according to PSNS & IMF and NNPP Waste Management Procedures, and state and federal waste regulations. Modifications to the barge slip or the transport route at the DOE Hanford Site would not be required under this alternative, as discussed in the 2012 EA.

2.3.2.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

The initial transport phase of Alternative 1 involves towing ex-Enterprise from its current location at Newport News Shipbuilding to one of the three commercial locations for partial dismantlement. The final commercial location would be determined through a competitive bidding process following the completion of this EIS/OEIS. The three alternative locations are described below in Sections 2.3.2.1.1 (Hampton Roads Metropolitan Area, Virginia) through 2.3.2.1.3 (Mobile, Alabama). Ex-Enterprise is non-operational (no propeller rotation or water intakes/discharges). The use of one or more assist tug boats would be required due to the size of the ship. Towing would be performed by a qualified contractor in accordance with requirements of Appendix H of the *U.S. Navy Towing Manual SI740-AA-MAM-010*, Rev 3, July 2002, as well as Naval Sea Systems Command Instruction 4740.12, *Towing and Preparation for Storage Specification for Inactivated Defueled Nuclear Powered Aircraft Carriers*. The contractor would be responsible for making all applicable notifications associated with towing activity and would adhere to all applicable safety requirements for towing ex-Enterprise. Commercial maritime pilots would be used for departures from and entries into ports. The towing contractor would prepare a towing plan and outline the procedures and guidelines for towing the unmanned ship.

2.3.2.1.1 Hampton Roads Metropolitan Area, Virginia

Alternative 1 could include the transport of ex-Enterprise within the Hampton Roads Metropolitan Area, Virginia (Figure 2-2) for partial dismantlement. The Hampton Roads Metropolitan Area has the capability to dismantle a ship of this size, and therefore, the Navy would not require new permanent facilities or facility improvements to complete this project. Numerous government and commercial ships have been constructed and deactivated in this metropolitan area. Ship repairs and upgrades are routinely conducted and can support the partial dismantlement of ex-Enterprise, as well as scheduled and emergent maintenance work.

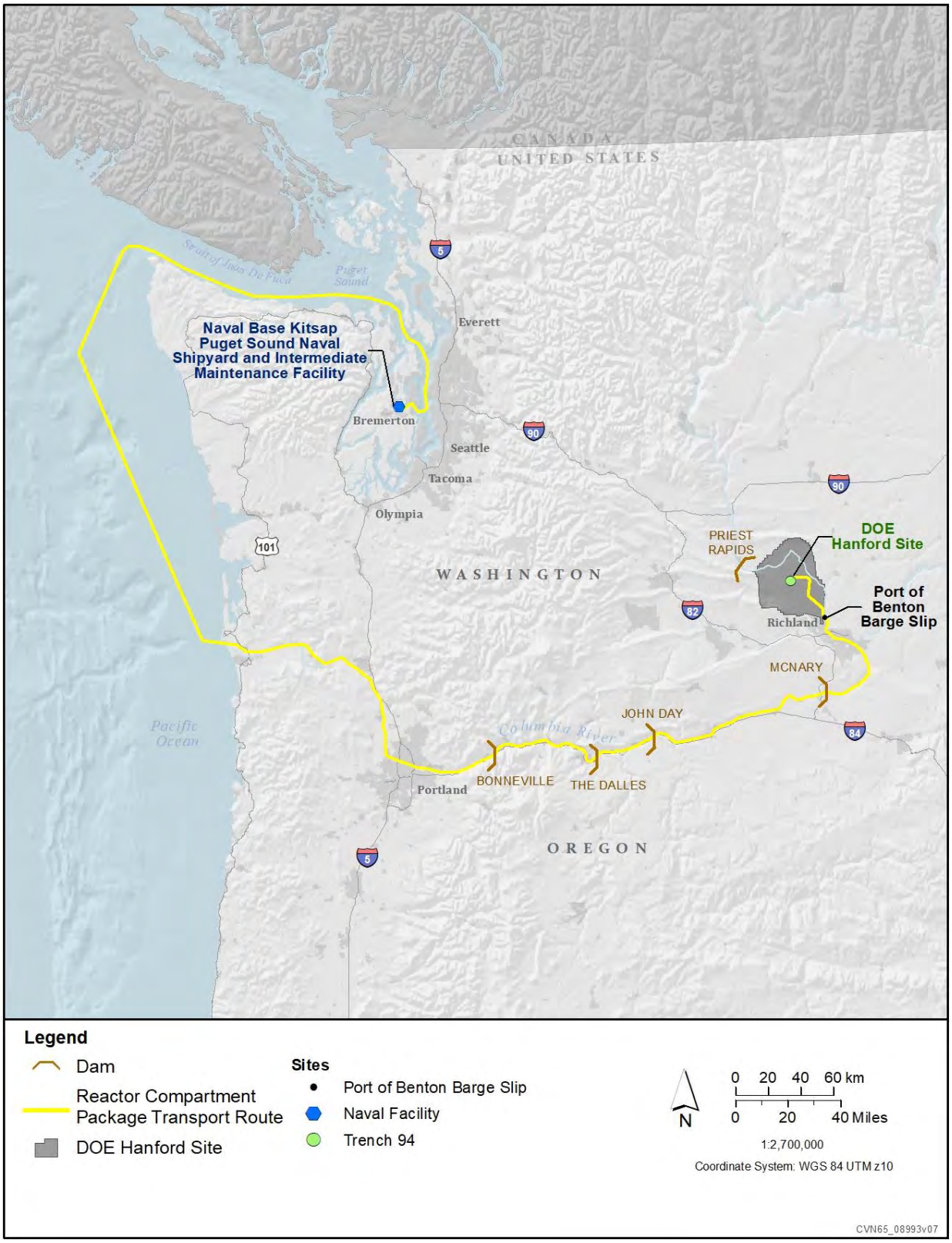


Figure 2-6: Reactor Compartment Package Transport Route

Newport News, Virginia, is the home of Newport News Shipbuilding, where naval radiological work is currently performed, and the aircraft carrier ex-Enterprise was constructed, serviced, and inactivated. Newport News Shipbuilding is a 550-acre facility located in the harbor on the southwest side of Newport News near the confluence of the James River and the Chesapeake Bay. Newport News also serves as a junction between the rails and the sea with the Newport News Marine Terminals located south of Newport News Shipbuilding. Newport News Shipbuilding is currently building Gerald R. Ford-Class aircraft carriers and performs refueling and complex overhaul work on other nuclear-powered ships. However, the specific facility for commercial dismantlement in the Hampton Roads Metropolitan Area, Virginia, has not been identified.

There are no navigational concerns for dismantling efforts performed in the Hampton Roads Metropolitan Area because the ship is currently docked at Newport News Shipbuilding and would only be moved to a new pier-side location with tugs if necessary. This metropolitan area requires no open-ocean towing, and major weather events would likely have minimal to no impact. Proposed towing within the Hampton Roads Metropolitan Area meets safety, navigation, and environmental requirements and other safeguards.

2.3.2.1.2 Brownsville, Texas

Alternative 1 could include towing ex-Enterprise from its current mooring location approximately 1,911 nautical miles (2,200 miles [mi.]) along the eastern seaboard, around the southern tip of Florida, across the Gulf of Mexico (see Figure 2-1) to the Brownsville Ship Channel (BSC) to Brownsville, Texas, for partial dismantling (Figure 2-7).

Brownsville, Texas, is located near the U.S.-Mexico border, where the Rio Grande River flows into the Gulf of Mexico. Ship dismantling facilities in the vicinity are located within the Port of Brownsville, which is in a man-made inlet south of South Padre Island. The Port of Brownsville connects to the Gulf of Mexico via Brazos Santiago Pass. The BSC (5 mi. section of the navigation channel) extends from the Port to the Laguna Madre. The remaining 12 mi. section of the channel was dredged through coastal prairie and passes adjacent to or through three salt marsh areas (Vadia Ancha, Bahia Grande, and San Martin Lake). The specific facility for commercial dismantlement in Brownsville has not been identified.

The Port of Brownsville is home to commercial ship recyclers that are capable of dismantling Navy conventionally powered aircraft carriers. Hundreds of vessels, including Maritime Administration (MARAD) and commercial ships, have been dismantled along the BSC. Dismantling and recycling activities currently occur under Navy and MARAD contracts. The BSC is routinely dredged. Commercial contractors in Brownsville are experienced with deconstructing large conventionally powered Navy ships. The Navy would not require new permanent facilities or facility improvements to complete the project, as all sites considered have existing infrastructure that could manage a ship of this size.

Proposed towing would meet safety, navigation, and environmental requirements and other safeguards. Towing would occur in the open ocean and could be impacted by major weather events.



Figure 2-7: Brownsville, Texas

2.3.2.1.3 Mobile, Alabama

Alternative 1 could include towing of ex-Enterprise from its current mooring location approximately 1,830 nautical miles (2,106 mi.) along the eastern seaboard, around the southern tip of Florida, along the Florida and Alabama coastlines (see Figure 2-1) to Mobile, Alabama, for partial dismantling (Figure 2-8). Ship dismantling facilities in Mobile, Alabama, analyzed in this EIS/OEIS, are located where the Mobile River empties into Mobile Bay and the Gulf of Mexico. The port has public, deep-water terminals with direct access to 1,500 mi. of inland and intracoastal waterways serving the Great Lakes, the Ohio and Tennessee river valleys (via the Tennessee-Tombigbee Waterway), and the Gulf of Mexico. Mobile has commercial facilities with the capability to dismantle a ship of this size, and therefore, the Navy would not require new permanent facilities or facility improvements to complete the project. The specific facility for commercial dismantlement in Mobile, Alabama, has not been identified.

Proposed towing would meet safety, navigation, and environmental requirements, and other safeguards. Towing would occur in the open ocean and could be impacted by major weather events.

2.3.2.2 Partial Dismantlement at Commercial Dismantlement Facility

Under Alternative 1, partial dismantling actions would potentially take place at one of the three commercial dismantling locations discussed above. Dismantling, also called ship breaking or ship scrapping, is any methodical disassembly of the structure of a ship. Two methods of dismantling a ship are the afloat (moored) method and the dry dock method. Most ship dismantling is performed afloat in slips, which are dredged openings in the bank of the ship channel. Slips are generally 400–700 feet (ft.) long and 100–120 ft. wide at the entrance. A large winch at the head of the slip is used to drag the hull farther into the slip as work progresses. As material is removed from the ship, it becomes lighter and is pulled ashore. Booms are placed around the ship to help contain any spills of liquids and materials used in ships that may be damaging to the environment.

Once turned over for dismantlement, dismantling consists of removing mechanical, hydraulic, or electronic components that have potential market value for resale or reuse, then physically cutting the remainder of the hull to allow recycling of metals and other materials. During the preparation phase of dismantling, small articles and propellers are removed, which allows the hull to be pulled into shallow water where cutting usually takes place. As layers of the ship are cut, large reusable or recyclable components are removed as they become accessible.

When removed, ship machinery components are typically handled in what is commonly called the scrap yard. These components, which may be stripped of valuable materials or cut into smaller pieces, may contain or be contaminated with hazardous materials, including asbestos, polychlorinated biphenyls (PCBs), lead-based paints, oils, or fuels. Asbestos-containing material is removed from cut lines and compartments so that large sections of the ship can be removed. The engine rooms usually contain higher levels of asbestos and, therefore, take the longest for asbestos removal to be complete. Any accessible PCB-containing materials are removed, as well as any PCB-containing paint coatings from areas to be cut. Some PCB-containing materials may be left in place, only to be removed after the large piece is moved to shore. Following asbestos and PCB removal, if required, paint is removed from surfaces to be cut. Paint may have lead and other heavy metals in it, and would be removed and disposed of in accordance with applicable regulations.



Figure 2-8: Mobile, Alabama

The Navy complies with applicable U.S. Environmental Protection Agency (EPA) and Occupational Safety and Health Administration regulations and would ensure that a contractor selected to perform this work has the capability to dismantle ships in a manner that protects the environment and worker health and safety. Contractors are required to have a technical operational plan, an environmental management plan, and a safety and health management plan in place for their work. The facility selected by a contractor for dismantlement would meet all applicable requirements.

2.3.2.3 Transport Waste and Recyclable Materials from Commercial Dismantlement Facility to an Approved Waste or Recycling Facility

Scrap metals, including steel, aluminum, copper, copper nickel alloy, and lesser amounts of other metals, are sorted by grade and composition and would be sold to remelting firms or to scrap metal brokers. Other materials that are not recycled, including hazardous materials and other wastes, are disposed of according to applicable local, state and federal laws and regulations.

2.3.2.4 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

Under Alternative 1, the propulsion space section, which contains the eight defueled reactor plants, would be separated from the rest of ex-Enterprise and transported to PSNS & IMF by heavy-lift ship (instead of in-water tow). The heavy-lift ship would leave the commercial dismantlement facility, navigate around the southern tip of South America, and transit north to the U.S. West Coast, continuing up the coast to northwestern Washington and into the Strait of Juan de Fuca, then south through Puget Sound (see Figure 2-5).

2.3.2.5 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages (No In-Water Work)

2.3.2.5.1 Liquid Removal

Once relocated to PSNS & IMF, some systems that were not drained during inactivation would be drained. Additional confirmatory drains would be performed in piping, tanks, and fluid system components remaining within the reactor compartment packages. Federal radiation exposure guidelines require radiological work be accomplished in a manner that keeps radiation exposure to workers and the public as low as reasonably achievable. The Navy would comply with NNPP standards for radiological controls. The following steps would be taken to remove radioactive liquids in the packages to the maximum extent practical while minimizing the exposure of workers to radiation. Liquids in piping systems external to the reactor compartment bulkheads would be removed by draining from existing valves at low points, dismantling piping systems, or an equivalent method. Liquids in piping systems internal to the reactor compartment bulkheads would be removed by draining from existing valves at low points. A non-biodegradable absorbent would be added to the primary shield water tanks to absorb any residual liquids in those locations. This draining methodology is in compliance with Washington Administrative Code 173-303.

Radioactive liquids from the reactor plant would be collected, stored, processed, and disposed of as discussed in Section 2.1.1 of the 1996 *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants*, hereinafter referred to as the 1996 EIS (Navy & DOE, 1996).

2.3.2.5.2 Radiation Exposure

Since its inception, the NNPP has emphasized the reduction of personnel exposure to radiation. The control of radiation exposure to shipyard workers is discussed in the annual report NT-22-2, *Occupational Radiation Exposure from U.S. Naval Nuclear Plants and their Support Facilities* issued by the Navy (NNPP, 2022). Radiation controls can include, but are not limited to, limited access, monitoring, shielding, use of personal protective equipment, and defined time/exposure limits. Section 4.1 of the 1996 EIS also provides applicable discussion on measures to limit and control radiation exposure (Navy & DOE, 1996).

The packaging of reactor compartments would involve draining fluid systems, cutting and sealing piping, removing components, and installing packaging and handling fixtures, similar to past reactor plant disposal operations. Sections 3.1 (Public and Occupational Health and Safety) and 3.2 (Hazardous and Radioactive Waste Management) analyze the potential impacts of radiation exposure from these operations.

2.3.2.5.3 Equipment Removal and Package Containment

Reactor compartment packaging at PSNS & IMF would require draining residual liquids in the piping systems, tanks, vessels, and other components of the reactor plants to the maximum extent practical; removing all temporary lead shielding installed in the reactor compartments; sealing radioactive systems; separating reactor compartments containing the reactor plants from the propulsion space section; and sealing the reactor compartments to provide high-integrity, fully welded steel reactor compartment packages. Remnant hull sections would be removed from the propulsion space section to facilitate reactor compartment packaging, as is currently done for various submarine and cruiser packages.

The process of removing equipment and material (including hazardous material) from ex-Enterprise during reactor compartment packaging would be similar to that described for cruisers in Section 2.1.1.3 of the 1996 EIS (Navy & DOE, 1996). Asbestos found in the insulation of pipes and other components, including the reactor plant, would be fully contained within the reactor compartment packages. Wool felt sound damping is considered to contain liquid PCB, and would be removed from the reactor compartments along with electrical equipment containing liquid PCBs, and disposed of under 40 CFR Part 761. Wool felt sound damping is also regulated under the Washington Administrative Code 173-303 for Resource Conservation and Recovery Act (RCRA) metals such as chromium. Ex-Enterprise reactor compartments are not expected to contain wool felt sound damping, but it would be removed if found. The remaining PCBs in reactor compartment packages are in a solid, non-leachable form (rubber, plastic, and paint) and are considered "PCB bulk product waste" under 40 CFR Part 761. Lead is found in reactor compartment packages, primarily as canned (inside a metal jacket) radiation shielding, ballast, and paint. If ballast lead is found exterior to the reactor compartment, it would be removed from the reactor compartment packages per agreement with Washington state. Permanently installed shielding lead would remain in the reactor compartment packages as shielding to protect workers, except for some shielding that must be removed to construct the package. All temporary lead shielding installed during inactivation would be removed. The remaining lead is regulated as a state-only dangerous waste under Washington state law (Washington State Legislature, 2020) but is not regulated as a hazardous waste under RCRA because lead used for shielding in LLRW disposal operations is not considered a waste by the EPA (Navy & DOE, 1996).

2.3.2.5.4 Construction of Eight Single Reactor Compartment Packages in Dry Dock

PSNS & IMF would construct eight single reactor compartment packages, approximately 36 ft. long, 40 ft. wide, and 47 ft. high, and weighing 1,651 tons (Figure 2-9). While the packages are being

constructed, the propulsion space section would be on a combination of blocks and track-mounted cradles that are designed to support and move the reactor compartments away from each other and the propulsion space section. These packages would be surveyed prior to shipment to determine radiation levels. External surface radiation levels of the packages are expected to be less than 1 millirem per hour (mrem/hr) on contact, a fraction of the 200 mrem/hr allowed under 49 CFR Part 173. This estimate is based on the fact that the highest contact radiation readings on cruiser reactor compartment packages were less than 1 mrem/hr and based on a comparison between ex-Enterprise and cruiser reactor compartment packages.

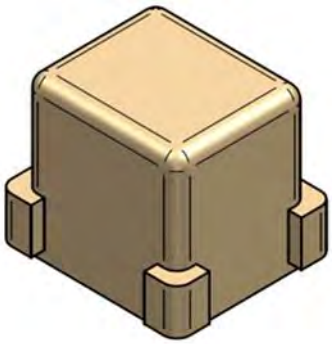


Figure 2-9: Alternative 1: Single Reactor Compartment Package

Ex-Enterprise would be dismantled around the reactor compartments to allow for separation and packaging. The remainder of the propulsion space section (remnant hull) would be dismantled and reusable metals recycled to allow the separated reactor compartment packages to be moved onto transport barges. At the end of this process, only the packaged reactor compartments would remain in the dry dock. Dedicated material bridges would be used from the hull to the dry dock apron, as was done for cruisers in the 1996 EIS (Navy & DOE, 1996). Material would be removed from ex-Enterprise via these bridges for ultimate disposal. Services and material handling equipment used for the current program would be adapted for ex-Enterprise, in sufficient quantity and capacity for the material removed. A six- to eight-year period in dry dock is estimated for completion of the metal/material processing required for reactor compartment packaging and remnant hull recycling of ex-Enterprise.

2.3.2.6 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

The DOE Hanford Site is located in southeastern Washington state, about 30 mi. east of Yakima and immediately north of Richland. Trench 94 is situated in 218-E-12B Low Level Burial Ground within the 200 East Area, near the center of the DOE Hanford Site in the Central Plateau region. Trench 94 is in an isolated area about 7 mi. from the Columbia River. Trench 94 contains various cruiser and submarine reactor compartment packages. The 1996 EIS analyzed the placement of up to 220 reactor compartment packages at Trench 94. The 2012 EA includes ex-Enterprise within this 220 package total.
Section 3.7.2.1.3 of the 2012 EA includes additional discussion. Figure 2-10 is an aerial photograph of Trench 94 taken in October 2021, showing that Trench 94 is approximately 1,600 ft. by 250 ft. As of 2022 the current trench configuration consists of 55 reactor compartment packages placed on concrete column foundations and 85 packages placed on the concrete ground level support system. Ex-Enterprise reactor compartment packages would fit within the trench floor footprint and are well within the 220 total packages analyzed. PSNS & IMF began placing reactor compartment packages on the ground level support system in fall of 1996. This substantially reduced the trench floor space occupied by each

package since they could be spaced closer together. On the ground level support system, the reactor compartment packages are a minimum of 2 ft. apart. The transport support fixtures extend beyond the packages, but are not considered part of the package and can be removed if necessary to allow access and placement of adjacent packages. PSNS & IMF would use a concrete rail support system to place the reactor compartment packages in Trench 94.

Additional rail structures would be added within Trench 94 to support the single reactor compartment packages, requiring limited excavation of the trench floor. It is expected the existing Trench 94 ramp would be used for transport of the reactor compartment packages. The current ramp provides sufficient area for a transporter to position the package for offload onto the rail support system.

2.3.2.7 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

The Navy has specially modified, reinforced, ocean-going transport barges for transporting cruiser and submarine reactor compartment packages. Support bulkheads were installed to carry the load in the center of the barge. Additional watertight bulkheads provide a greater number of tanks than are typically used for an ocean cargo barge to provide added stability in the unlikely event the barge is damaged by an accident. The barges meet both U.S. Coast Guard intact and damaged (one tank flooded) upright stability requirements (46 CFR Parts 151 and 172) and Navy stability requirements, which require stability with two adjacent flooded tanks under storm wind and wave conditions. The barges are maintained to both Navy and commercial standards and are regularly inspected by the American Bureau of Shipping and the U.S. Coast Guard. The same strict criteria would be used for the transport barges for ex-Enterprise reactor compartment packages.

After the eight reactor compartment packages are constructed and the remainder of the ship removed from dry dock, the dry dock would be flooded, partially submerging the packages to allow a transport barge into the dock for loading. After moving the barge into place, the dry dock would be drained. The packages would be raised with hydraulic jacks to the level of the barge deck. The hydraulic jacks would be supported by concrete keel blocks or other suitable blocking, steel plates, and timbers. These materials would also be used to provide a base for the track to move the packages horizontally onto the barge deck. Raising the packages would be accomplished in small increments, with blocks and shims placed under the packages as they are raised to support them in case of a loss of hydraulic jacking pressure. The reactor compartment packages would be moved onto the barge using track-mounted high capacity rollers. When in place, the packages would be welded to the steel barge deck.



Figure 2-10: Various Cruiser and Submarine Reactor Compartment Packages in Trench 94 at the DOE Hanford Site, October 2021

The barge would be towed from PSNS & IMF using a large ocean-going tug certified by the American Bureau of Shipping. River tugs would be used on the Columbia River (Figure 2-11). Qualified pilots would navigate all restricted waterways in Puget Sound, when crossing the Columbia River bar, and on the Columbia River. Shipments would be scheduled to avoid the less favorable Pacific Ocean winter weather.



Figure 2-11: Example of Transport Barge with Cruiser Reactor Compartment Package

The transport route would be the same as used for various cruiser and submarine reactor compartment packages (see Figure 2-6). The waterborne transport route for the reactor compartment packages from PSNS & IMF would follow the normal shipping lanes in Sinclair Inlet, through Rich Passage, past Restoration Point, and northerly through Puget Sound. The route is then westerly through the Strait of Juan de Fuca (staying south of the inbound Vessel Traffic System lane when transiting out of the Strait of Juan de Fuca to remain in U.S. waters), around Cape Flattery, south along the Washington coast (outside of the Olympic Coast National Marine Sanctuary Area to be Avoided) to the mouth of the Columbia River. The route then goes up the Columbia River, following the shipping channel used for the regular transport of commercial cargo. The river route passes through the navigation locks at Bonneville Dam, the Dalles Dam, John Day Dam, and McNary Dam to the barge slip located in north Richland, Washington, at river mile 342.8 (Navy & DOE, 1996). The time from PSNS & IMF departure to arrival at the barge slip would be approximately three days. Prior to transporting the reactor compartment packages to the DOE Hanford Site, PSNS & IMF would coordinate with McNary Dam and Priest Rapids Dam to raise or lower the level of the reservoir to a level at which the barge can be placed in the slip and offloaded. After offloading operations are complete, the reservoir would return to normal operational levels.

Upon arrival at the Port of Benton barge slip, the barge would be placed in the slip. Water would be added to the barge compartments in a controlled sequence to ground the barge firmly on the gravel slip bottom. Once grounded, the deck of the barge would be against and level with the top of the sill at the landward (west) end of the slip. The slip bottom would be prepared to receive the barge under required permits from the U.S. Army Corps of Engineers (USACE) and the Washington State Department of Fish and Wildlife.

The welds holding the reactor compartment packages to the barge would be cut, and the packages would be jacked up and placed upon four steel columns. Jacking would be in small increments with safety cribbing blocks and shims temporarily placed under the load to support the package if hydraulic jack pressure were lost. A transport vehicle would then be driven onto the barge and under the packages. Multiple-wheel, high-capacity transporters specially designed for heavy loads would be used. The packages would be attached to the transport vehicle using welded attachments. The time required to offload the packages from the barge would be 24–36 hours from the time the barge is docked.

2.3.2.8 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

The land transport route currently used for the various cruiser and submarine reactor compartment packages would also be used for ex-Enterprise (Figure 2-12). The route would begin at the Port of Benton barge slip south of the DOE Hanford Site on the west bank of the Columbia River.

The transport route consists of the gravel access ramp at the Port of Benton barge slip and a short section of C Avenue and continues northwest on a 1 mi. (1.6 kilometers [km]) gravel road through the DOE Office of Science land. The route intersects the DOE Hanford Site boundary at Route 4 South, south of the 300 Area and continues north and northwest for approximately 12 mi. (19 km) along Route 4 South, a well-maintained, four-lane, paved highway, to the Wye Barricade Bypass. One-half the width of the highway would be needed to transport the reactor compartment packages along Route 4 South, except for three areas where the entire width of the pavement would be needed to maneuver around traffic lights. From the Wye Barricade Bypass, the transport route continues north for approximately 6 mi. (10 km) to the old Hanford Townsite on Route 2 South. The transport route then turns west on Route 11A for about 6 mi. (10 km) to Canton Avenue and follows a transition into Trench 94 at the DOE Hanford Site.

Multiple-wheel, high-capacity transporters used to haul reactor compartment packages are of modular construction (Figure 2-13). Modules are typically bolted together end to end and side to side to provide an adequate number of wheels to carry the intended load and keep the load per tire to levels the road can accept. For reactor compartment packages considered in this EIS/OEIS, transporter modules would be assembled to provide enough wheels to properly distribute the load.

The time to transport a package between the Port of Benton barge slip and the Wye Barricade Bypass along the transport route would be approximately four to six hours. This section of the highway is open to the public and would be closed with a rolling road closure. Transport arrangements would be made for the safety of other drivers. For example, transport would be scheduled on a weekend to avoid heavy use of the roadway, travel could be restricted to one side of the four-lane highway, or pilot cars could be used to provide safe escort around the package on the southbound lane for bypass.

Beyond the Wye Barricade Bypass the roadway could be closed to general traffic for the four-to-six-hour transit from the Wye Barricade Bypass to the 200 East Area along Route 2 South and Route 11A. Traffic could be routed from the Wye Barricade Bypass along Route 4 South into the 200 Area East.

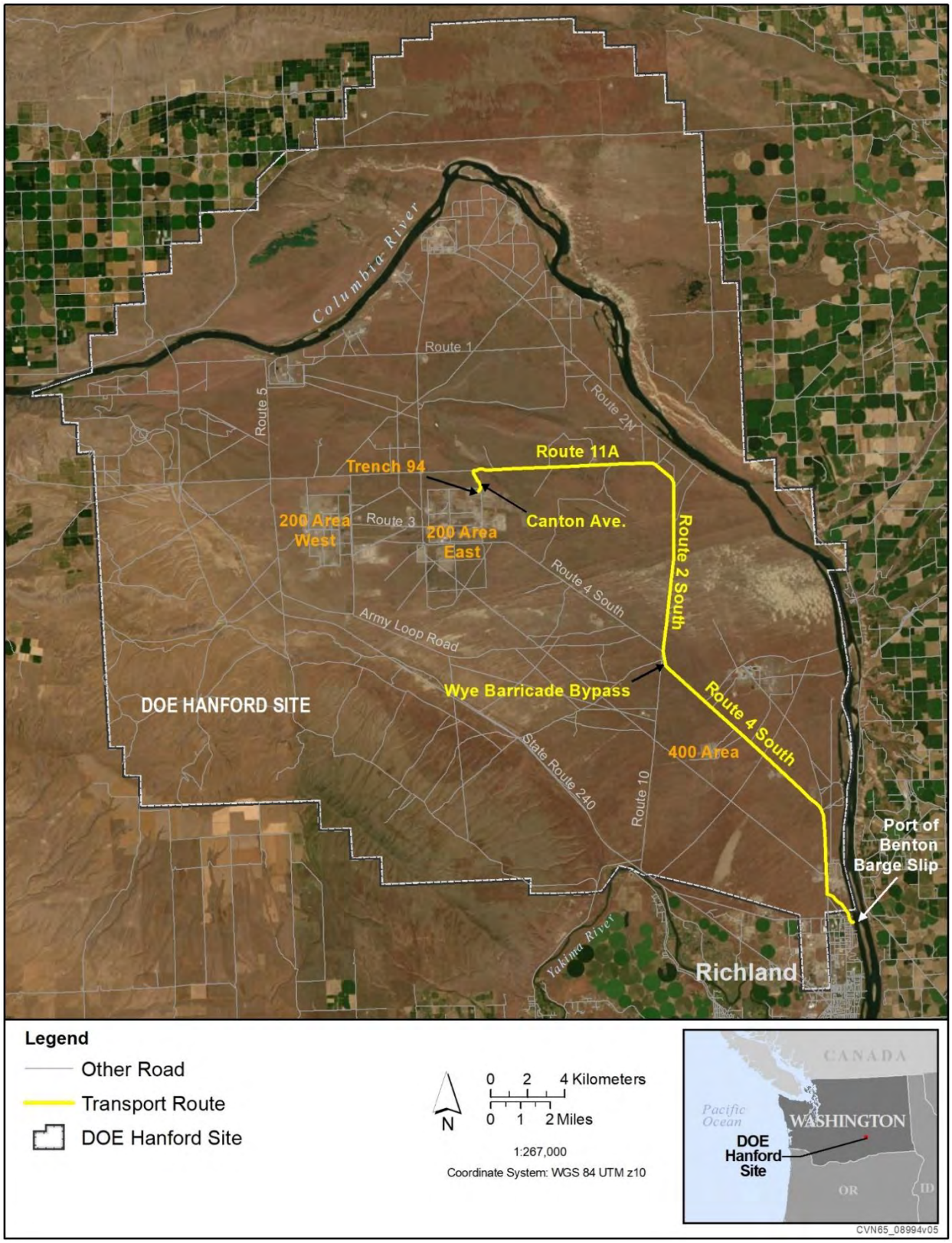


Figure 2-12: Reactor Compartment Package Transport Route

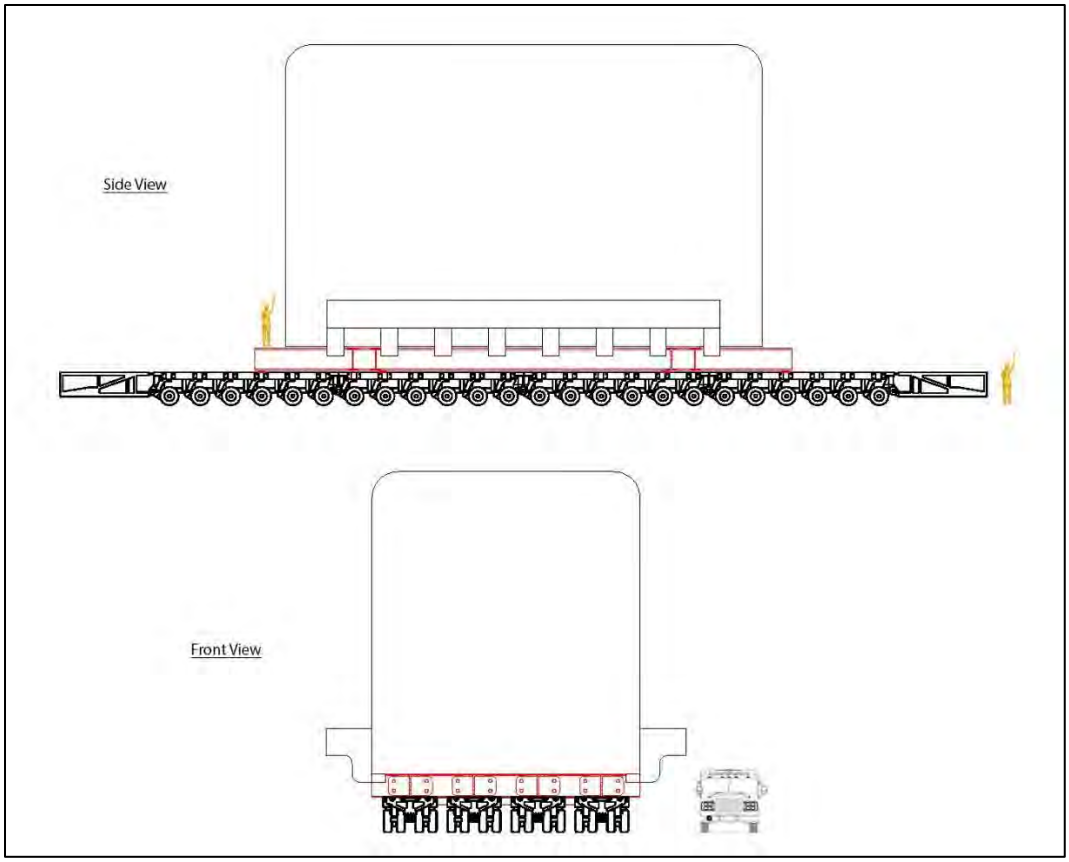


Figure 2-13: Example of a Multiple-Wheel, High-Capacity Transporter with ex-Enterprise Dual Reactor Compartment Package

2.3.3 Alternative 2 – Dual Reactor Compartment Packages

Alternative 2, similar to Alternative 1, would include the partial dismantlement of ex-Enterprise at an authorized ship dismantlement facility by removing areas of the ship outside the reactor compartments. The remainder of the ship containing the reactor compartments would then be transported to PSNS & IMF to prepare reactor compartment packages for disposal at Trench 94 at the DOE Hanford Site. However, under Alternative 2, the Navy would construct and dispose of four dual reactor compartment packages, instead of eight single reactor compartment packages, at Trench 94 at the DOE Hanford Site. Construction of the larger and heavier packages would require approximately five years in dry dock (a reduction of one to three years compared to Alternative 1).

2.3.3.1 Tow ex-Enterprise from Newport News Shipbuilding in Newport News, Virginia, to Commercial Dismantlement Facility

Transportation would be similar to Alternative 1, where ex-Enterprise would be towed to one of three commercial locations for partial dismantlement and separation of the propulsion space section for transport to PSNS & IMF.

2.3.3.2 Partial Dismantlement at Commercial Dismantlement Facility

Partial dismantlement would be the same as described under Alternative 1.

2.3.3.3 Transport Waste and Recyclable Materials from Commercial Dismantlement Facility to an Approved Waste or Recycling Facility

The transport of waste and recyclable materials from partial dismantlement would be the same as described under Alternative 1.

2.3.3.4 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

Shipment of the propulsion space section would be the same as described under Alternative 1.

2.3.3.5 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Four Dual Reactor Compartment Packages (No In-Water Work)

2.3.3.5.1 Liquid Removal

As described for Alternative 1, once relocated to PSNS & IMF, remaining piping, tanks, and fluid system components within the reactor compartment packages would be drained to the maximum extent practical.

2.3.3.5.2 Radiation Exposure

Since its inception, the NNPP has emphasized the reduction of personnel exposure to radiation. The control of radiation exposure to shipyard workers is discussed in the annual report NT-22-2, *Occupational Radiation Exposure from U.S. Naval Nuclear Plants and their Support Facilities*, issued by the Navy (NNPP, 2022). Radiation controls can include, but are not limited to, limited access, monitoring, shielding, use of personal protective equipment, and defined time/exposure limits. Section 4.1 of the 1996 EIS also provides applicable discussion on measures to limit and control radiation exposure (Navy & DOE, 1996).

The packaging of reactor compartments would involve draining fluid systems, cutting and sealing piping, removing components, and installing packaging and handling fixtures, similar to past reactor plant disposal operations. Alternative 2 would follow the same processes as Alternative 1 and, with proficiency, a reduction in exposure is also expected as a result of not having to separate individual reactor compartments. Sections 3.1 (Public and Occupational Health and Safety) and 3.2 (Hazardous and Radioactive Waste Management) analyze the potential impacts of radiation exposure from these operations.

2.3.3.5.3 Construction of Four Dual Reactor Compartment Packages in Dry Dock

Unlike Alternative 1, the four conjoined pairs of reactor compartments would not be separated, which would result in the construction and transport of four dual reactor compartment packages (about 71 ft. long, 40 ft. wide, 47 ft. high, and 3,304-ton weight) (Figure 2-14). These four dual reactor compartment packages would be significantly larger and heavier than the eight single reactor compartment packages of Alternative 1 (about 36 ft. long, 40 ft. wide, 47 ft. high, and 1,651-ton weight). Construction of the larger and heavier packages would require approximately five years in dry dock (a reduction of one to three years compared to Alternative 1).



Figure 2-14: Alternative 2: Dual Reactor Compartment Package

2.3.3.6 Port of Benton Barge Slip Modifications

Alternative 2 would require infrastructure modifications to the Port of Benton barge slip and the transport route at the DOE Hanford Site due to the heavier weight and larger size of the dual reactor compartment packages. Modifications would involve excavation to allow for the widening of the barge slip (in-water work) and inland pile driving and concrete work. The exact method of modification cannot be determined this early in the planning process. Multiple types of heavy equipment, such as hydraulic excavators, pile drivers, cranes, and dump trucks would be expected. Modifications are expected to remove approximately 2,625 cubic yards of material and place 71 cubic yards of material in the water. Any sediment removed from the Port of Benton would be disposed at an upland location.

The current slip would be expanded to accommodate the barge required for the dual reactor compartment packages (Figure 2-15). The slip would be widened 18 ft., making the new slip 80 ft. wide, and extended by 15 ft. in length, making the new length 165 ft. The widening would require the removal of the south jetty. To minimize settling of the substrate, 3 ft. of soil under the area where the south jetty currently stands would be removed and backfilled with gravel to benefit juvenile salmonids.

A 70-foot sheet pile wall would be tied into the south edge of the current slip face. This wall would be constructed of approximately 11 sheet piles driven with a vibratory hammer 50–65 ft. into the soil with 0–15 ft. above the riverbed. The sheet piles would be vibrated into the ground before removing the jetty. Vibrating the piles in place before jetty removal would substantially reduce impacts on salmonids in the river by dissipating the energy into the ground before affecting the water.

The existing slip headwall would be strengthened to handle the increased weight of the larger loads. Construction would include 24 landside pipe piles, 30 inches in diameter, spaced 10 ft. apart with a concrete slab on top, which would be placed to strengthen the headwall. The new slab would be level with the existing sill cap and soil anchor slabs. Additional widening of the road would not be needed.

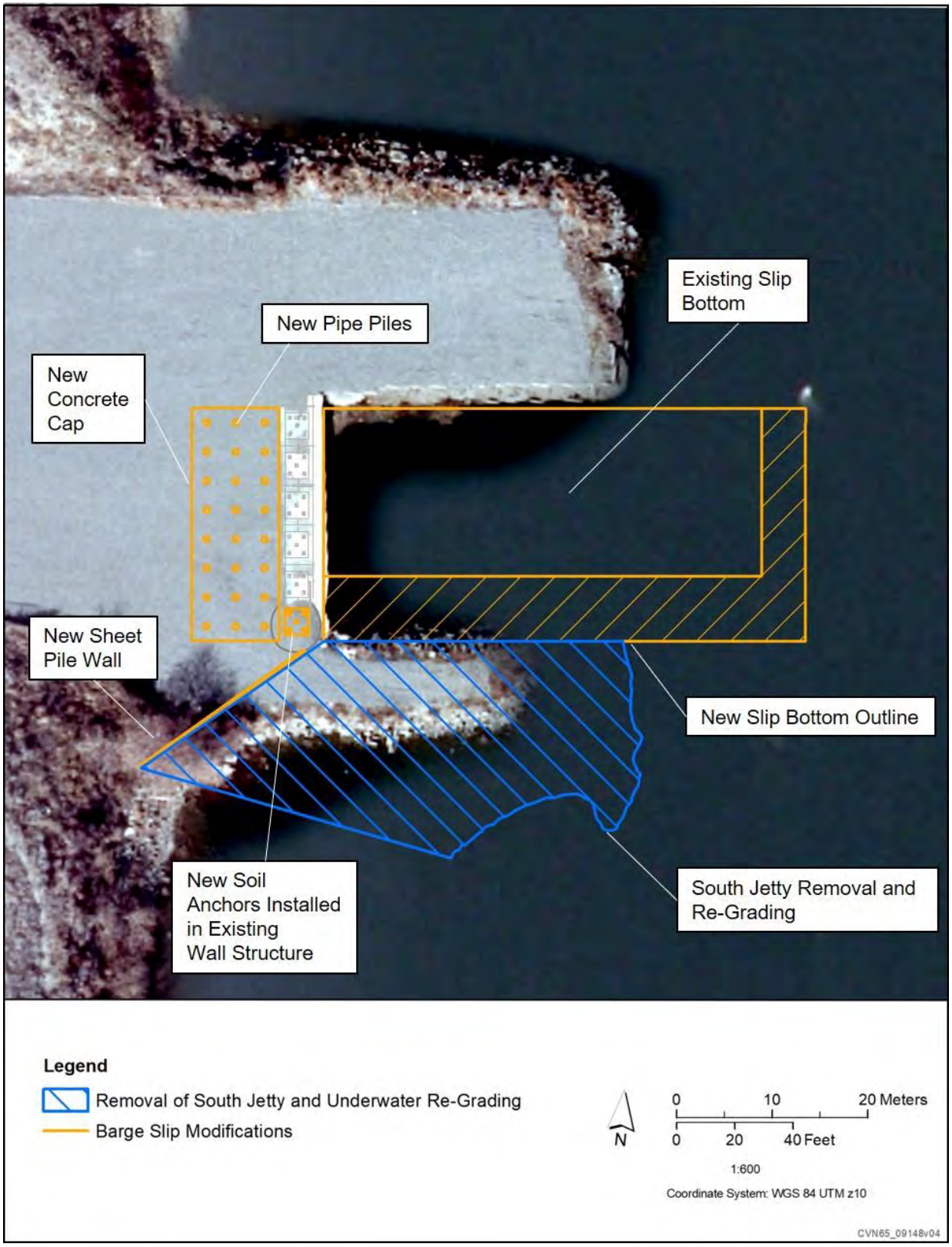


Figure 2-15: Port of Benton Barge Slip Modifications

2.3.3.7 Road Improvements Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site

The Navy would use DOE road systems to transport reactor compartment packages from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site, similar to Alternative 1 (see Figure 2-12). Current packages range between 1,000 and 1,680 tons. Improvements are analyzed at up to 11 locations on the transport route (Figure 2-16) to support dual reactor compartment packages that could weigh up to 3,304 tons and be carried by larger transporters.

Table 2-3 lists the proposed improvements to the route, and Figure 2-16, Figure 2-17, Figure 2-18, and Figure 2-19 present the locations of the proposed improvements.

Table 2-3: Proposed Route Improvements

Location	Description
1	Fill to reduce vertical curve and side-slope
2	Fill on both sides of road for gradual vertical curve transition
3	Cut hill to reduce vertical curve
4	Cut hill to reduce vertical curve Modify transition to Route 4 South by filling along east side of the Route 4 South shoulder
5	Modify transition to Route 4 South by filling along north side of the Route 4 South shoulder
6	Modify transition to Route 2 South by cutting along the east side of the Route 2 South shoulder
7	Fill dip in road, pave median
8	Adjust side-slope transition by filling southbound lanes, paving
9	Adjust side-slope transition on both sides of railroad Reduce side-slope of curve by filling eastbound lanes or cutting westbound lanes Reduce side-slope of curve by filling westbound lanes or cutting, paving eastbound lanes
10	Adjust side-slope and vertical curve transition by filling shoulder and possibly southbound lanes Fill for gradual vertical curve transition, paving
11	Cut and fill for gradual vertical curve transition

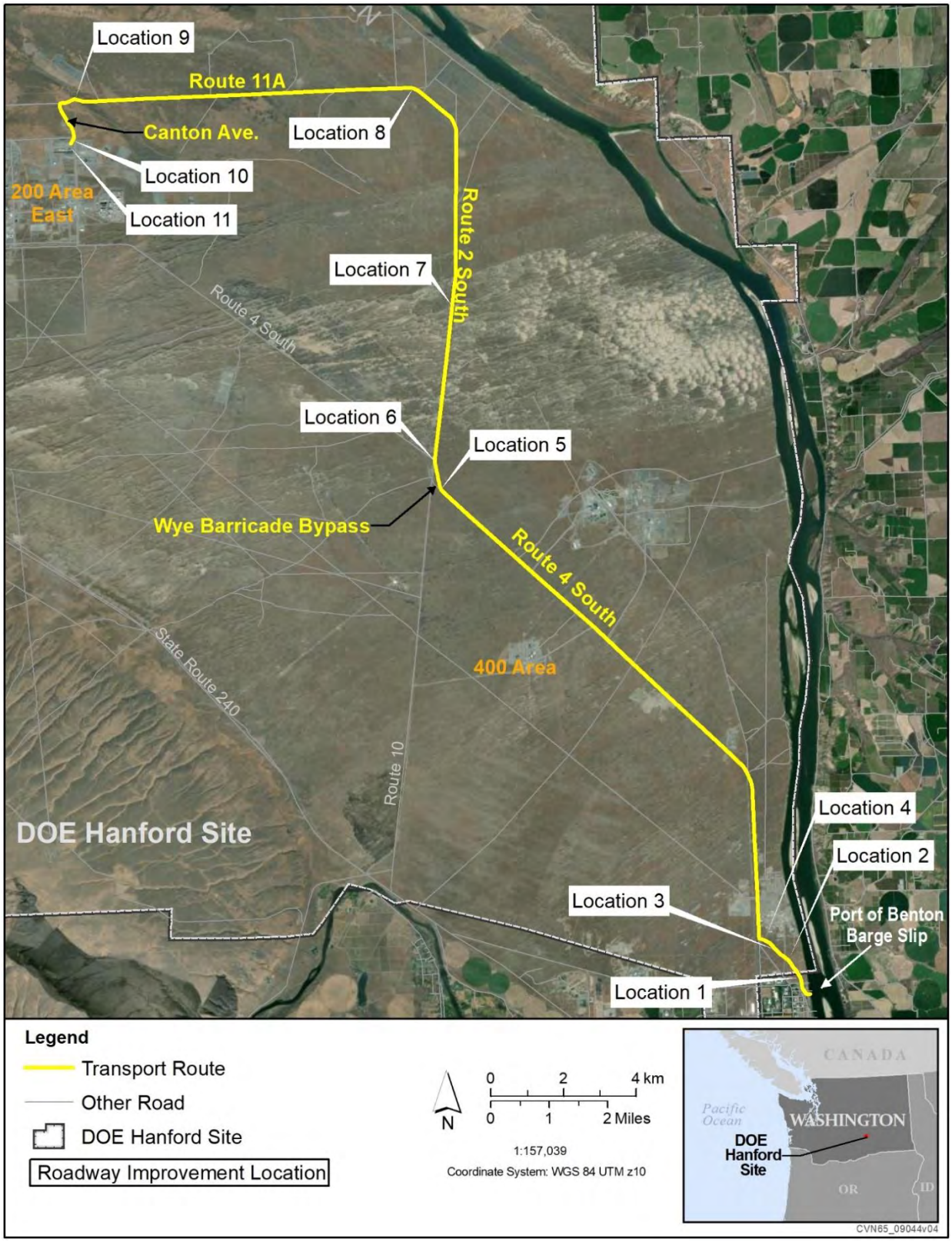


Figure 2-16: Navy Transport Route and Approximate Locations of Proposed Improvements



Figure 2-17: Road Improvements 1–4

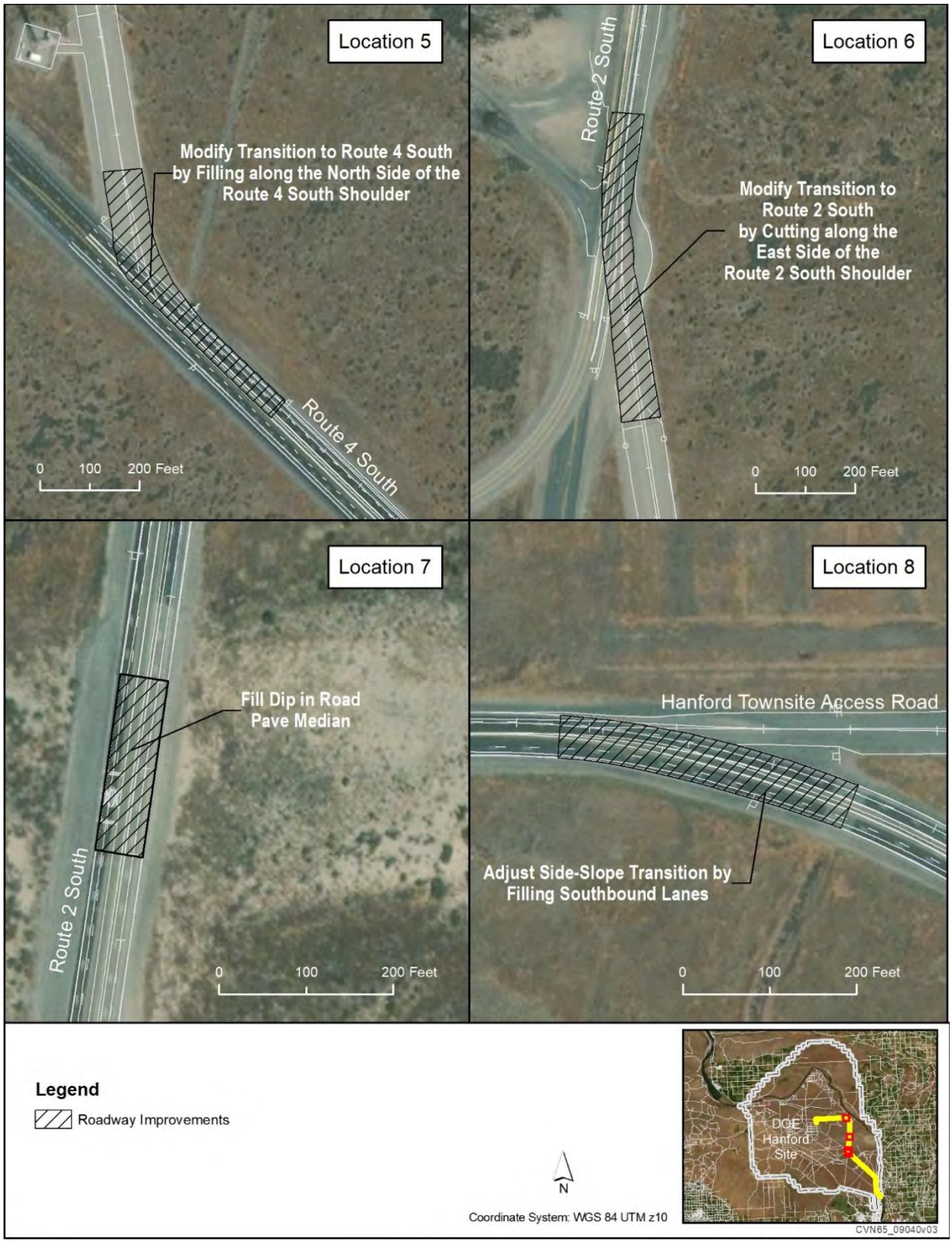


Figure 2-18: Road Improvements 5–8

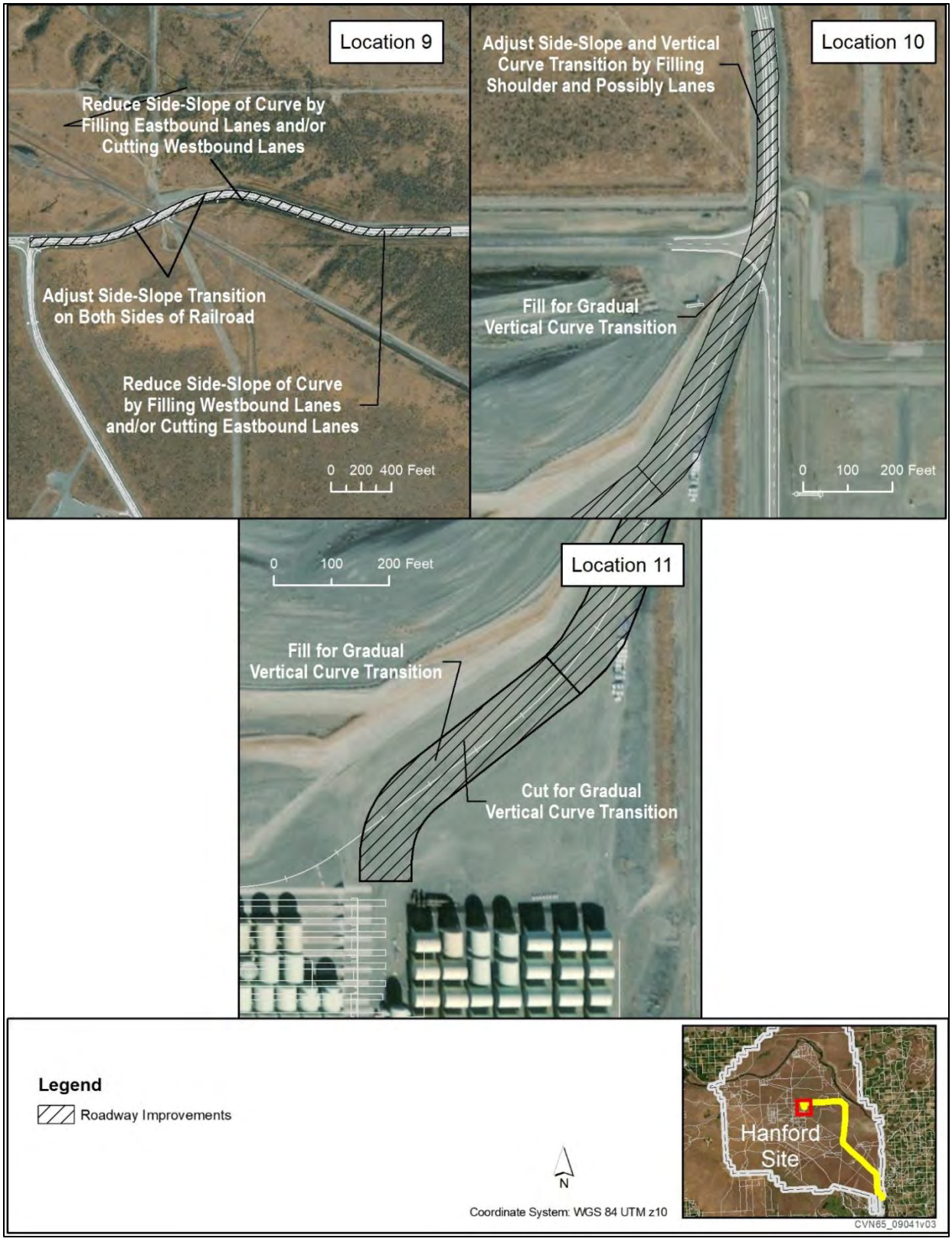


Figure 2-19: Road Improvements 9–11

2.3.3.8 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

Under Alternative 2, the rail system installation in Trench 94 at the DOE Hanford Site would be the same as described for Alternative 1.

2.3.3.9 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

The four dual reactor compartment packages would be transported by a newly constructed barge capable of handling the larger dual reactor compartment packages via the transport route (see Figure 2-6) from PSNS & IMF to the Port of Benton barge slip at Richland, Washington, similar to Alternative 1 and using the same number of tug boats per shipment.

2.3.3.10 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

From the Port of Benton barge slip, each dual reactor compartment package would be loaded onto a multi-wheel, high-capacity transporter capable of handling the larger dual reactor compartment package for transfer to Trench 94 at the DOE Hanford Site, as described in Alternative 1.

2.3.4 Alternative 3 (Preferred Alternative) – Commercial Dismantlement

Alternative 3 (Preferred Alternative) includes towing ex-Enterprise to an authorized commercial (ship dismantlement facility and complete dismantlement of the ship by an authorized commercial ship dismantlement contractor, including cutting apart the eight defueled reactor plants into segments for packaging in several hundred small containers that meet applicable NRC, Department of Transportation (DOT), and DOE transportation requirements for subsequent disposal at either a DOE, NRC, or NRC agreement state commercial LLRW facility. These facilities are described in Section 2.3.4.2 (Alternative 3 [Preferred Alternative] Disposal of Low-Level Radioactive Waste and Hazardous Waste). The reasonable and feasible commercial dismantlement locations for this EIS/OEIS include Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; and Mobile, Alabama. The competition for the potential contract will be full and open, consistent with federal statute and regulation, and geographical restrictions cannot be used to exclude offerors. While the Navy does not expect additional competitive offers outside these geographic parameters, if such an offer is made and represents the successful bid for the dismantlement contract, the Navy would perform additional analysis as necessary to ensure that it considers unanalyzed effects of a contract award in such a location. Potential offerors will be required to comply with all applicable environmental protection laws and regulations.

For the purpose of this analysis, it is assumed all commercial dismantlement activities would take place at the same facility as described for the reactor compartment packaging alternatives. The specific facility for commercial dismantlement has not been identified. Non-radioactive portions of the ship would be recycled or disposed of in accordance with applicable local, state, and federal laws.

Alternative 3 (Preferred Alternative) is modeled after successful and ongoing conventional Navy aircraft carrier dismantlement (by contract at commercial facilities), successful and ongoing commercial nuclear power plant decommissioning by contract with nuclear services companies, and the successful dismantlement of a U.S. Army barge (STURGIS) containing a defueled nuclear reactor by contract with nuclear services companies at commercial facilities (USACE, 2014). Several civilian, land-based, nuclear power plants, which are larger than Navy aircraft carrier reactor plants, have successfully been dismantled and disposed of by the commercial nuclear services industry (DOE, 2006). Navy conventionally powered aircraft carriers similar in size to ex-Enterprise are currently being dismantled in

Brownsville, Texas. Since the 2012 EA, four such Navy conventionally powered aircraft carriers have been dismantled. A partnership between commercial ventures located at a facility that can dismantle conventional carriers is envisioned for this alternative.

Ex-Enterprise would be towed to one of three commercial locations (Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama) for dismantlement. Dismantlement includes disassembly of the eight defueled reactor plants for packaging into several hundred small containers that meet applicable NRC, DOT, and DOE transportation requirements for disposal at a DOE or authorized NRC or agreement state commercial LLRW facility.

conventional aircraft carrier dismantlement, which has been conducted waterborne and has not required the use of a dry dock. The ship is systematically disassembled waterborne while maintaining ship stability, until the final portions of the ship remain. These portions of the ship are then attached to a winch and incrementally pulled partially onto shore to complete the final disassembly efforts. The specific method(s) of dismantlement would be dependent on the location and contractor chosen, which is outside the scope of this EIS/OEIS. All viable locations are expected to have the appropriate facilities and permits in place to implement the method(s) of dismantlement. Section 2.3.2.2 (Partial Dismantlement at Commercial Dismantlement Facility) presents the typical methods for dismantling ships, which are applicable to both partial and complete dismantlement. Dismantlement would be managed under a Navy contract process.

Under Alternative 3 (Preferred Alternative), the contractor would prepare reactor plant dismantlement and disposal planning documents associated with areas such as radiological controls, radiation safety, and environmental protection to conform with NRC standards (NRC, 2000). The Navy envisions that the contractor would be held to the standards prescribed by the NRC for the accomplishment of radiological work described in these plans. The adherence of the dismantlement contractor to NRC safety standards would be required under their contract with the Navy, and the Navy envisions contractually invoking NRC standards and obtaining NRC oversight via an interagency support agreement to accomplish the dismantlement of ex-Enterprise. The Navy would retain regulatory authority and contractually support use of the NRC requirements. The NRC would review project planning and engineering documents, conduct oversight of project execution, and provide the Navy recommendations for enforcement with the Navy's dismantlement contractor.

While, as discussed above, the Navy envisions using NRC standards and oversight to accomplish the dismantlement of ex-Enterprise under this alternative, the Navy could also use the established NNPP requirements for performing radiological work. These requirements meet or exceed the requirements of the corresponding NRC requirements.

2.3.4.1 Complete Dismantlement of ex-Enterprise at a Commercial Dismantlement Facility

Alternative 3 (Preferred Alternative) assesses the complete dismantlement of ex-Enterprise at one of three locations described above. The Navy would place a contract to dismantle ex-Enterprise at a commercial facility, and the Navy envisions implementing the NRC decommissioning process for radioactive material licensees described in the NRC Consolidated Decommissioning Guidance (NUREG-1757) with direct support from the NRC.

Alternative 3 (Preferred Alternative) would generate radioactive waste, mixed waste, hazardous waste, and recyclable material. Waste disposal and transportation operations are discussed in Section 3.2 (Hazardous and Radioactive Waste Management), Appendix E (Radiological Evaluation of Reactor Plant

Disposal Alternatives), and Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants).

Alternative 3 (Preferred Alternative) includes disassembly of the eight defueled reactor plants for packaging into several hundred small containers that meet DOT requirements for subsequent disposal at either a DOE, NRC, or NRC agreement State commercial LLRW facility. The reactor plants would be cut into segments that can fit in typical shipping containers (8 ft. high, 8 ft. wide, 40 ft. long, and with a 55,000 pound [27.5 ton] maximum weight) or transported via other shipping methods (Figure 2-20).

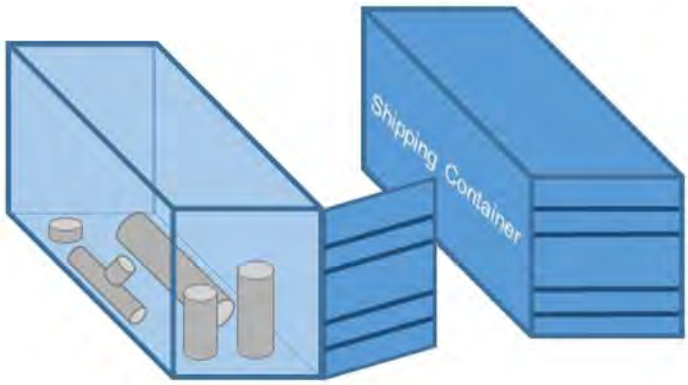


Figure 2-20: Alternative 3 (Preferred Alternative): Commercial Dismantlement Waste Shipping Options

Under Alternative 3 (Preferred Alternative) occupational exposures to radiation and radioactive materials would be managed within all regulatory limits (10 CFR Part 20.1201). Detailed analysis is presented in Section 3.1 (Public and Occupational Health and Safety).

As discussed in Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Defueled Reactor Plants), dismantlement of all eight defueled reactor plants is conservatively estimated to result in up to 440 LLRW shipments of large components and container express (commonly known as CONEX) boxes (or similar-sized packages) of radioactive material being shipped by barge, rail, or truck to one or more waste facilities for disposal, as summarized below:

- Reactor Vessels: 8 shipments (Type B Packages)
- Reactor Plant Components (large): up to 80 shipments
- Reactor Plant Components (small): up to 352 CONEX boxes

Transportation routes to each of the three potential radioactive disposal sites are dependent on the origin and transportation mode. Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Defueled Reactor Plants) shows the route and the distance in miles using each type of transportation mode (barge, rail, or truck) for that route. There could be up to five potential routes and modes of transport that the LLRW could follow from each commercial dismantlement facility. Routes used in the analyses of resources vary based on the resource being analyzed. See each specific section of Chapter 3 (Affected Environment and Environmental Consequences) for details on how transportation routes were chosen for each analysis.

As provided in Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Defueled Reactor Plants), radiation dose to the public from transportation of radioactive waste is estimated to be low, and to be considerably below average background levels of radiation in the environment.

2.3.4.2 Alternative 3 (Preferred Alternative) Disposal of Low-Level Radioactive Waste and Hazardous Waste

The Navy estimates that dismantlement of all eight reactor plants under Alternative 3 (Preferred Alternative) would conservatively result in up to 440 shipments of large components and CONEX boxes or similarly sized packages of LLRW being shipped by barge, rail, or truck to one or more waste facilities for disposal. Dismantlement activities would also generate a small number of additional shipments of LLRW incidental to disposal of the reactor plants, which would consist of material such as piping, tooling, and personal protective equipment. These additional wastes are similar to the small amounts of LLRW that are generated incidental to construction of reactor compartment packages and are disposed of at established waste disposal sites. Dismantlement waste shipments would also include hazardous materials, asbestos-containing materials, and PCB bulk waste, as is typical for the dismantlement of Navy ships. All shipments would meet applicable NRC, DOT, and DOE shipping requirements.

Suitable LLRW, hazardous waste, and radioactive PCB waste disposal facilities are available for wastes produced during commercial dismantlement of ex-Enterprise (see Figure 2-1). State-licensed or DOE LLRW disposal facilities in the United States that currently accept waste generated, consistent with their waste acceptance criteria, by the dismantlement facilities being considered include the following:

- *Waste Control Specialists LLC (Andrews, Texas)*: A privately owned facility licensed to accept NRC Radioactive Class A, B, and C waste and federal waste (federal waste, including from the Navy, is sourced from DOE material under the Atomic Energy Act). This facility accepts waste from Texas-NRC Compact agreement states (Texas and Vermont) in addition to other states upon approval of a waste import permit. This facility also accepts mixed hazardous and radioactive PCB waste.
- *EnergySolutions (Clive, Utah)*: Utah is part of the Northwest Compact on LLRW Management, but EnergySolutions is allowed to accept NRC Class A waste from unaffiliated states per the Third Amended Resolution and Order of the Northwest Interstate Compact. This facility also accepts mixed hazardous and radioactive PCB waste.
- *DOE-Savannah River Site (Aiken, South Carolina)*: This DOE-owned facility accepts mostly radioactive waste generated on site, but is able to accept any level of radioactive waste. This facility also accepts radioactive PCB waste.

Non-radioactive wastes, including hazardous and PCB wastes, would be disposed of according to applicable federal, state, and municipal regulations.

2.4 Preferred Alternative

Alternative 3 (Commercial Dismantlement) is the Preferred Alternative for the following reasons:

The Navy has a strong operational focus in the Pacific region, and the work PSNS & IMF performs in support of the operational nuclear fleet only increases in importance. As a result of growing workload due to a higher fleet operational tempo and capacity shortages across all Navy public shipyards, PSNS & IMF is challenged to execute their current and projected workload with their existing facilities. Furthermore, the Government Accountability Office (GAO) reported that the Navy needs capabilities for workloads such as battle damage repair, which would be in addition to the already challenging workload

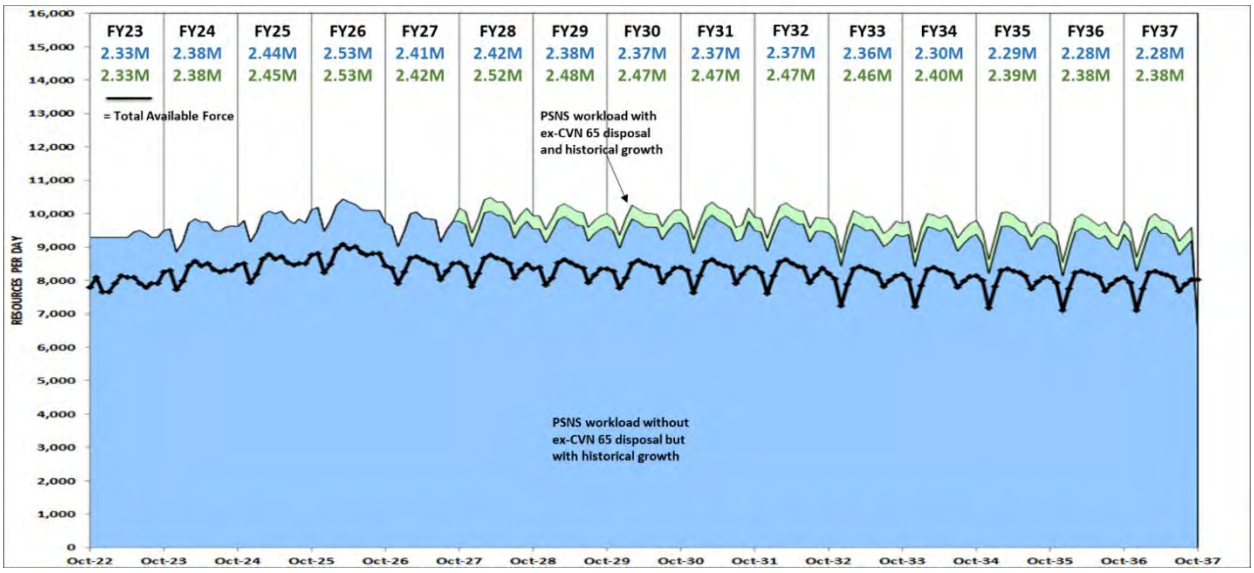
(GAO, 2021). The United States could not achieve its national security objectives without PSNS & IMF. Leveraging options to perform ex-Enterprise disposal at commercial facilities is advantageous to the Navy and allows PSNS & IMF to prioritize the limited public shipyard infrastructure and workforce for active fleet maintenance.

The workforce of Navy public shipyards has been under tremendous pressure to execute their primary mission of maintaining the operational fleet. Commercial dismantlement of ex-Enterprise would allow the Navy to keep the specially trained and qualified PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivations and reactor compartment package work that are already part of the PSNS & IMF workload. Since the 2012 EA, PSNS & IMF workload associated with active Navy nuclear-powered ships has increased.

Figure 2-21 provides the updated PSNS & IMF workload from Fiscal Year (FY) 22 to FY31 with a comparison to workload that does not include ex-Enterprise reactor compartment package work based on future availability schedules (as they are known today plus historical average growth realized as the shipyard workload progresses across the Future Years Defense Plan vs. the total available work force). This average growth model is supported by the GAO-18-523 report, as well as expenditures since the last update was provided. An overlay of the expected PSNS & IMF workload over the same period with ex-Enterprise reactor compartment package preparation is also shown in green. Whether or not PSNS & IMF is assigned ex-Enterprise reactor compartment package availability, the historic growth model in the workload shows that PSNS & IMF would be executing at a level that already exceeds the sustainable capacity of the existing workforce for the greater part of the next 15 years. Removal of ex-Enterprise allows PSNS & IMF to continue executing its already heavy workload that includes Nimitz-Class, Ohio-Class, and Seawolf-Class maintenance, as well as Ohio-Class inactivations, Los Angeles-Class inactivations, and reactor compartment package work. Additionally PSNS & IMF workload is expanding into Gerald R. Ford-Class and Virginia-Class maintenance, in alignment with the Navy and the nation's national security mission through focus on active Fleet maintenance. Consequently, removal of ex-Enterprise from the PSNS & IMF workload would not result in any decrease in workforce at PSNS & IMF.

- The FY28/FY29 spike in workload shown in Figure 2-21 is based on current estimates for overlapping CVN docking with back-to-back CVN pier-side availabilities, including first of class CVN 79 FY28 PIA (Planned Incremental Availability), as well as overlapping Ohio-Class inactivations.
- The FY30 through FY32 spike includes overlapping CVN availabilities that are outside the Future Years Defense Plan, and are expected to adjust in schedule to support shipyard capacity.
- Workload picture aligns with GAO-18-523 report recognition that future year workload grows above known work by 15 percent or more. Workload from FY27 through FY32 includes anticipated growth based on this report.

The Navy is continually seeking ways to reduce costs and ensure that all work is completed in a manner protective of human health and the environment. Based on information about the known PSNS & IMF workload, the reactor compartment packaging alternatives would schedule the earliest completion of ex-Enterprise disposal during 2030–2040. Commercial dismantlement is estimated to be completed sooner and at a lower cost. Table 2-2 provides this comparison.



Note: MDs = Mandays; The anticipated MDs for each fiscal year without ex-Enterprise reactor compartment packages are shown in blue, while the anticipated MDs with ex-Enterprise reactor compartment packages are shown in green.

Figure 2-21: PSNS & IMF Workload FY22–FY37

2.5 Alternatives Considered but Not Carried Forward for Detailed Analysis

In accordance with Office of the Chief of Naval Operations Instruction 4770.5J, *General Policy for the Inactivation, Retirement, and Disposition of U.S. Naval Vessels*, dismantling is the only method approved for the disposition of nuclear-powered ships stricken from the Naval Vessel Register and is required to be accomplished in the United States or its territories in accordance with existing laws and regulations. Any non-dismantling or non-United States alternatives were eliminated from analysis as they would not follow this policy.

The Navy methods to reduce the inactive ship inventory include the following:

- interagency transfers to the MARAD, U.S. Coast Guard, National Ocean and Atmospheric Administration, or other U.S. federal agencies
- donations for memorial and museum use as static public displays
- foreign military transfers
- dismantling and recycling
- fleet training exercises
- experimental use, including weapons effectiveness testing
- transfers to U.S. states, territories, or other political subdivisions thereof for use as artificial reefs

Navy policy, as described by Office of the Chief of Naval Operations Instruction 4770.5J, which is reflective of federal statutes, is to dismantle and recycle nuclear-powered ships and submarines stricken from the Naval Vessel Register. All other alternatives discussed above are not viable for disposal of ex-Enterprise and were eliminated and not carried forward for further analysis. In addition, the Navy did not carry forward alternatives that use solely government facilities in order to prioritize the limited public shipyard infrastructure and workforce for active fleet maintenance.

2.6 Best Management Practices Included in Proposed Action

This section presents an overview by alternative of the best management practices (BMPs) that are incorporated into the Proposed Action in this document. BMPs are existing policies, practices, and measures that the Navy would adopt to reduce the environmental impacts of designated activities, functions, or processes. Although BMPs mitigate potential impacts by avoiding, minimizing or reducing/eliminating impacts, BMPs are distinguished from potential mitigation measures because BMPs are (1) existing requirements for the Proposed Action; (2) ongoing, regularly occurring practices; or (3) not unique to this Proposed Action. In other words, the BMPs identified in this document are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the NEPA environmental review process for the Proposed Action.

BMPs include actions required by federal or state law or regulation. The recognition of the general management measures prevents unnecessarily evaluating impacts that are unlikely to occur.

2.6.1 Alternative 1

The following sections discuss applicable regulations for management, packaging, transport, and disposal of reactor compartment packages. PSNS & IMF operates under a number of permits that allow it to conduct work including ship repair, reactor compartment packaging, and hull recycle. Transport of reactor compartment packages to Trench 94 at the DOE Hanford Site is supported by standing permits for underwater maintenance work at the Port of Benton barge slip. These permits currently include an USACE Nationwide Permit #3 authorization (ref: NWS-2005-1384), issued October 16, 2017, and a Hydraulic Project Approval (No. 2021-3-13+02) from the Washington State Department of Fish and Wildlife, issued June 22, 2021. Renewals and modifications would be sought as needed to support ongoing reactor compartment disposal. The use of Trench 94 at the DOE Hanford Site is supported by an ongoing permit process between DOE and the Washington State Department of Ecology (ECY).

2.6.1.1 Shipyard Preparations Prior to Transport

The applicable regulations for the reactor compartment packaging at PSNS & IMF include the Clean Air Act, Clean Water Act, Toxic Substances Control Act, and RCRA. The Puget Sound Clean Air Agency has regulatory authority for the Clean Air Act. The EPA has Clean Water Act and Toxic Substances Control Act regulatory authority. The ECY has RCRA regulatory authority.

PSNS & IMF has an Air Operating Permit (No. 21177), issued by the Puget Sound Clean Air Agency, for the Controlled Industrial Area of PSNS & IMF, issued in December 2003. This permit expired in December 2008 but has been extended administratively to date.

PSNS & IMF has a National Pollutant Discharge Elimination System Permit issued by EPA under Section 402 of the Clean Water Act (no. WA-000206-2). This permit expired April 1999 but has been extended administratively by EPA to date. PSNS & IMF also has a State Waste Discharge permit (No. ST000374) issued by ECY in November 2011 and has been extended administratively to date.

PSNS & IMF has a permit issued by the ECY for operation of a facility to store Dangerous and Mixed Waste (No. WA2 17002 3418).

Renewals, extensions, and modifications as needed would be sought to support ongoing operations at PSNS & IMF.

2.6.1.2 Conditions of Transport to Department of Energy Hanford Site

Transportation would meet the requirements specified in 10 CFR Part 71 (Packaging and Transportation of Radioactive Materials) and 49 CFR Parts 171-179 (Hazardous Material Regulations). The requirements of 10 CFR Part 71 involve evaluating the reactor compartment package containment structure under criteria representative of both normal conditions of transport and a hypothetical accident scenario, including the following:

- free drop striking the surface in a position for which maximum damage is expected
- puncture
- temperature influences
- external pressure (reduced and increased)
- water spray
- vibration conditions
- fire (1,475 degrees for a half-hour)
- submergence (at least 50 ft.)

These requirements are also implemented by 49 CFR Part 173.

An engineering analysis of the reactor compartment package design would be performed to assess the performance under the conditions discussed above. The analysis results would then be compared with the specific requirements listed in 10 CFR Part 71.51. The package design based on this analysis would ensure 10 CFR Part 71 requirements are met. Actual physical testing of reactor compartment packages would be impractical due to weight and size considerations and is not required by 10 CFR Part 71.

Section 2.1.5.2 of the 1996 EIS provides an analysis of the effect on reactor compartment packages of the conditions of 10 CFR Part 71 discussed above (Navy & DOE, 1996). Ex-Enterprise reactor compartment packages proposed under Alternative 1 would be of similar size and shape to ex-Long Beach reactor compartment packages, and the analysis and conclusions from the 1996 EIS would apply to ex-Enterprise reactor compartment packages as well (Navy & DOE, 1996). In summary, all packages would maintain their integrity of containment for the conditions analyzed (e.g., free drop, puncture test, high temperature, external pressure, water spray, vibration, fire, and submergence).

2.6.1.3 Disposal at Department of Energy Hanford Site

Land disposal at Trench 94 at the DOE Hanford Site is regulated by state and federal agencies. DOE manages the disposal of the radioactive material contained in the reactor compartment packages under DOE Order 435.1, Chg 2, Radioactive Waste Management (DOE, 2021). The ECY regulates the reactor compartment packages as a state-only dangerous waste under Washington Administrative Code 173-303, Dangerous Waste Regulations due to the quantity of permanent lead shielding present. Trench 94 operates under the interim status standards of Washington Administrative Code 173-303-400. DOE and the ECY are engaged in a process to develop and issue a final permit for areas used for dangerous waste disposal at the DOE Hanford Site, including Trench 94.

PCBs are found on Navy ships, commonly in wool felt sound damping, electrical cable rubber, and paint. Wool felt sound damping and electrical equipment containing liquid PCBs would be removed and disposed of under 40 CFR Part 761. Wool felt sound damping is also typically regulated under Washington Administrative Code 173-303 for metals such as chromium. Ex-Enterprise reactor compartments are not expected to contain the wool felt sound damping, but this material would be removed if found. The remaining PCBs in the reactor compartment packages would be in a solid,

non-leachable form such as in rubber, plastic, and paint, and are considered "PCB bulk product waste" under 40 CFR Part 761. "PCB bulk product waste" of the types found in reactor compartment packages may be disposed of in solid waste (municipal) landfills.

Asbestos insulation is commonly found in older ships. Asbestos is regulated in the work place, in removal operations, and in the environment. Asbestos would be properly contained to meet local (Benton Clean Air Agency) and federal (40 CFR Part 61) requirements.

Sections 173-303-280 through 173-303-395 of the Washington Administrative Code describe state requirements for facilities which store, treat, or dispose of dangerous waste and which must be permitted by the state. The disposal of reactor compartment packages at Trench 94 at the DOE Hanford Site would be regulated under these sections.

2.6.2 Alternative 2

Under Alternative 2, the regulations for management, packaging, transport, and disposal of ex-Enterprise reactor compartment packages would be the same as Alternative 1.

Best management practices for Port of Benton barge slip modifications include the following:

- DOE would be notified prior to start of work that could affect sensitive research equipment located near the Port of Benton barge slip and the transport route. DOE requires notice to implement standard practices for mitigating vibratory effects on the equipment.
- Staging areas for the Port of Benton barge slip modifications would be located in existing developed areas immediately west of the slip headwall, within the existing access road, and the existing gravel parking area approximately 200 yards uphill to the west of the slip. This area is currently used for general operations equipment staging at the barge slip.
- Sheet piles would be placed with a vibratory hammer before the removal of the jetty to reduce the pressure wave to insignificant levels.
- Other in-water work would be done within the in-water work window to minimize impacts on migrating salmonids.
- The contractor would not pollute water with any substance defined as a dangerous or hazardous, or a regulated substance by federal, state, and local laws and regulations.
- Fueling and lubrication of equipment and motor vehicles would be performed primarily at the staging area. If these actions must be done on site, they would be conducted in a manner that affords the maximum protection against spills. If any material is spilled, the contractor would immediately remove the material and restore the area to the condition that existed prior to the spill. Section 3.2.3.3 (Alternative 2: Dual Reactor Compartment Packages) has additional detail.
- Special measures would be taken to prevent chemicals, fuels, oils, grease, bituminous paint, and waste washings from entering public lands and specifically Columbia River water.
- Construction waste would be collected at the site and disposed of at proper sites away from the river.
- Turbidity fences would be used to confine all turbidity within the aquatic construction area.
- The area under the excavated south jetty would be covered with gravel to benefit juvenile salmonids.

The barge slip was completed late in the year 1972 and so now meets the minimum age for evaluation for eligibility for the National Register of Historic Properties. The barge slip was not evaluated for this EIS/OEIS as the Preferred Alternative (Alternative 3 – Commercial Dismantlement) will not affect it. If

Alternative 2 were to be selected, the barge slip would be evaluated and, if it is eligible, the Navy would implement best management practices consistent with the results of a National Historic Preservation Act Section 106 review.

Transport route improvements would be designed and constructed in accordance with the geotechnical report for the Proposed Action and applicable building and grading codes. Special measures would be implemented in accordance with the stormwater pollution prevention plan. For improvement locations #1–4, the Navy would coordinate with the DOE Pacific Northwest Site Office and Pacific Northwest National Laboratory prior to work on the haul road and identify any mitigation measures. The following best management practices were identified to reduce impacts on biological resources:

- avoid undisturbed habitats adjacent to the project area
- keep vehicles and heavy machinery within the non-vegetated road prism at all times, including during the staging of materials, equipment, and machinery; if laydown areas are required, they must be identified before work begins and included in the ecological compliance review
- use vehicle and equipment cleaning stations to minimize the introduction and spread of weeds during construction; clean vehicles and equipment before entering and as soon as possible after leaving each work area

Additionally, during Port of Benton barge slip or road modification work, the contractor would enforce the following actions to control fugitive dust:

- use water suppressants
- minimize activity during periods of high winds
- use covered chutes, covered containers, or collection control equipment when handling, transferring, or storing dusty material
- keep paved surfaces clean
- restrict access or limit vehicle speeds on unpaved areas to 15 miles per hour
- limit the amount graded at any one time

All construction waste, debris, and dredged material would become property of the contractor. The materials would be handled, transported, and disposed of offsite at an appropriate facility in accordance with all federal, state, and local laws and requirements.

2.6.3 Alternative 3 (Preferred Alternative)

The following sections discuss the applicable regulations for management, packaging, transport, and disposal of radiologically controlled material.

2.6.3.1 Normal Conditions of Transport

Waste transportation and other aspects of the proposed dismantlement would be conducted in accordance with applicable NRC, DOT, and DOE regulations. State agencies may also require shippers of hazardous radioactive materials to register with state agencies. For some hazardous and oversized shipments, shippers must coordinate with local agencies, including law enforcement, emergency services, fire departments, and others as requested by county or municipal authorities. Commercial dismantlement of the ship would result in about 440 CONEX boxes or similar-sized packages of LLRW (e.g., piping, components) being shipped for disposal by barge, rail, or truck to one or more of the following authorized low-level radioactive waste facilities: EnergySolutions in Clive, Utah; the DOE Savannah River Site near Aiken, South Carolina; and Waste Control Specialists in Andrews, Texas. The

eight reactor vessels would require shipment as Type B packages per 49 CFR Part 173.431, including packaging design and construction to meet stringent integrity requirements. Table 2-4 provides estimated numbers and types of LLRW shipments as part of Alternative 3 (Preferred Alternative).

Table 2-4: Shipments

Mode	Shipment Type	Total Number of Shipments	Size[1] (feet)
Alternative 3 (Preferred Alternative)[2]			
Commercial Dismantlement	Reactor Vessel	8	15 D x 21 L
Commercial Dismantlement	Other Large Reactor Plant Components	80	Max. 10 D x 25 L
Commercial Dismantlement	Remainder of Reactor Compartment in CONEX boxes	352	8 W x 8 H x 40 L
Alternative 1 (for comparison)			
Reactor Compartment Package to the DOE Hanford Site	Single Reactor Compartment Package	8	39.8 W x 46.6 H x 35.5 L
Alternative 2 (for comparison)			
Reactor Compartment Package to the DOE Hanford Site	Dual Reactor Compartment Package	4	39.8 W x 46.6 H x 71.0 L

[1]Package sizes are those used for the analysis and are approximate.
[2]For Alternative 3 (Preferred Alternative), 55 packages contain the material for one reactor compartment.
Notes: CONEX = container express, D = Depth, H = Height, L = Length, W = Width

2.6.3.2 Disposal

With regards to the disposal of the reactor plants, waste facilities are limited on the type of waste they can accept based on their site license and their waste acceptance criteria. For example, the EnergySolutions waste site in Utah can only accept Class A waste. Waste classifications are established by the NRC (10 CFR Part 61.55) and are applicable to waste to be disposed of in an NRC or agreement state licensed facility. Class A waste is the lowest non-exempt waste class, is allowed the lowest levels of specific long-lived radionuclides (listed in Tables 1 and 2 of 10 CFR Part 61.55), and is required to meet only the specific characteristics set forth by the NRC. Class B waste may contain higher levels of radioactivity for the specific long-lived radionuclides, but must also meet more rigorous requirements on waste form to ensure stability after land disposal. Class C waste may contain even higher levels of radioactivity for specific long-lived radionuclides, must meet more rigorous requirements on waste form, and must be protected against inadvertent intrusion.

Waste Control Specialists Federal Waste Facility in Texas can accept Class A, Class B, Class C, and mixed low-level waste. DOE sites have limits based on site-specific conditions. Appendix D of the 1996 EIS discusses application of the NRC classification system and DOE classification system to the internal structure of the reactor vessels of the ship classes being disposed of, noting that the structures would be acceptable for land disposal using assumptions appropriate for disposal within the sealed reactor vessels

and within the sealed reactor compartment packages at the DOE Hanford Site. For Alternative 3 (Preferred Alternative), the containment provided by a sealed ex-Enterprise reactor vessel in a Type B package during transit conditions would be equivalent to the reactor compartment package, and it would be appropriate to use the reactor vessel internal structure cylindrical volume to assign a waste disposal classification. Regardless of the use of cylindrical volume or smaller structure volume, it is expected that ex-Enterprise reactor vessels (and internal structure) would be disposed of as a Class C waste under the NRC regulations (or DOE Category 3 for the DOE Savannah River Site option) (Section 3.2.1.2.1.1 [Federal and State Radioactive Waste Regulations] provides additional discussion).

3 Affected Environment and Environmental Consequences

This chapter describes the United States (U.S.) Department of the Navy (Navy) approach to analysis, existing environmental conditions, as well as the analysis of resources potentially impacted by the Proposed Action described in Chapter 2 (Description of Proposed Action and Alternatives).

3.1 Public and Occupational Health and Safety

This section of the Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) describes public health and safety, including occupational safety associated with the Proposed Action and alternatives. The analysis includes potential effects related to hazardous work, hazardous materials, and radioactive materials during ex-Enterprise disposal operations.

While the U.S. Navy has removed all of the nuclear fuel, low-level radioactive, hazardous, and mixed radioactive and hazardous materials remain onboard the ship, and exposure to these materials during dismantlement needs to be assessed for potential effects on workers and the public. This section of the EIS/OEIS addresses potential effects from exposure to these materials. Section 3.2 (Hazardous and Radioactive Waste Management) describes waste management and disposal actions.

3.1.1 Methodology

3.1.1.1 Region of Influence

For all alternatives, the Region of Influence (ROI) includes the population of Navy and contractor workers at government facilities; contractors and Navy oversight personnel at commercial dismantlement facilities; Navy workers and contractors associated with other projects at these facilities; and local residents. For dismantlement operations at commercial dismantlement facilities, it is anticipated that a portion of the dismantlement contractor workforce would temporarily relocate to the ROI. During transportation activities, the ROI includes both transportation workers and the public along land and water transportation routes. Under the No Action Alternative, the ROI would include Newport News Shipbuilding in Newport News, Virginia and the surrounding area. If the No Action Alternative is selected, ex-Enterprise would remain in its current location.

Under Alternatives 1 and 2 (the reactor compartment packaging alternatives), the ROI of the Proposed Action would include the public along waste transportation routes as well as communities immediately surrounding Newport News, Virginia; commercial dismantlement facilities in Virginia, Texas, and Alabama; Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) in Bremerton, Washington; the Port of Benton barge slip and the U.S. Department of Energy (DOE) Hanford Site in Richland, Washington. Water routes include ex-Enterprise tow from Newport News, Virginia, to a commercial dismantlement facility; the heavy-lift shipping route for transportation of the propulsion space section from the commercial dismantlement facility location to PSNS & IMF; and the barge route for the reactor compartment packages from PSNS & IMF to the barge slip. The ROI for the reactor compartment packaging alternatives also includes the road transport from the barge slip to Trench 94 at the DOE Hanford Site for land disposal.

For the reactor compartment packaging alternatives, the transportation routes for ex-Enterprise and the propulsion space section are summarized in Table 3.1-1. The No Action Alternative does not involve a tow and is not addressed in Table 3.1-1.

Table 3.1-1: Water Transportation Routes from Newport News, Virginia

Location of Complete or Partial Commercial Dismantlement	For Alternatives 1, 2, and 3		For Alternatives 1 and 2 only	
	Tow Route from Newport News, VA	Tow Distance to Commercial Dismantlement Location (nm) [1]	Heavy-lift Ship Route to PSNS & IMF via the Strait of Magellan	Heavy-lift Ship Route Distance to PSNS & IMF (nm)[1]
Hampton Roads Metropolitan Area, VA	Local tow	Local tow	South along the eastern U.S. coast, through the Caribbean Sea, around South America, and north to PSNS & IMF	19,300
Brownsville, TX	South along the eastern U.S. coast, around Florida, and across the Gulf of Mexico	1,700	East through the Gulf of Mexico, through the Caribbean Sea, around South America, and north to PSNS & IMF	20,550
Mobile, AL	South along the eastern U.S. coast, around Florida, and north through the Gulf of Mexico	1,400	South through the Gulf of Mexico, through the Caribbean Sea, around South America, and north to PSNS & IMF	20,160

[1]Approximate distance calculated by route distance in GIS, using Mercator projecting and avoiding non-US Economic Exclusion Zones (Port of Tacoma used in place of PSNS)
Notes: AL = Alabama, nm = nautical mile, PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, TX = Texas, U.S. = United States, VA = Virginia

For Alternative 3 (Preferred Alternative), the ROIs for the commercial dismantlement facilities in Virginia, Texas, and Alabama are the same as those described for the reactor compartment packaging alternatives. However, for Alternative 3 (Preferred Alternative), there would be no heavy-lift ship movement of the propulsion space section to PSNS & IMF or dismantlement work at PSNS & IMF. The approximate tow routes and distances for Alternative 3 (Preferred Alternative) are provided in Table 3.1-1. For purposes of assessing transportation-related health and safety impacts under Alternative 3 (Preferred Alternative) and to analyze the longest/bounding distance, all low-level radioactive waste (LLRW) is assumed to be shipped from the commercial dismantlement facility to Utah for disposal. The risks associated with truck transportation are considered the most heavily impacted by route distance and populations along the routes, both of which are maximized on routes to Utah. By comparison, disposal locations in Texas and South Carolina are shorter distances from each of the commercial dismantlement sites considered. Use of these longer routes, as representative of LLRW disposal, would bound the public exposure risk without having to consider factors that could have lesser effects on results, such as road conditions, state regulation, and number of bridges or tunnels. Additionally, the industry standard radioactive materials transportation risk model, RADTRAN, does not consider these factors in incident-free or accident scenarios. While rail transport is a viable and economically feasible transportation method for large volumes of waste over land, including radioactive waste, rail transport presents a lower public safety concern than trucking. Similarly, barge transportation would have a lower public health and safety impact but is only a viable transportation option to the DOE Savannah River Site (SRS) located along the Savannah River near Aiken, South Carolina. Therefore, this EIS/OEIS considers

the impacts from truck transport for the over-land transport of waste as bounding any public health and safety effects (Table 3.1-2).

Table 3.1-2: Truck Transportation of LLRW from Commercial Dismantlement Locations to Disposal Locations Available Under Alternative 3 (Preferred Alternative)

Origin	Newport News, Virginia		
Destination	EnergySolutions (UT)	WCS (TX)	SRS (SC)
Approximate route miles	2,323	1,806	545
Number of states traveled through	10	8	3
States traveled through	VA, WV, KY, IN, IL, MO, IA, NE, WY, UT	VA, NC, SC, GA, AL, MS, LA, TX	VA, NC, SC
Approximate total persons within a 1-mile-wide corridor [1]	2,761,464	2,940,262	776,991
Origin	**Brownsville, Texas**		
Destination	EnergySolutions (UT)	WCS (TX)	SRS (SC)
Approximate route miles	2,461	729	1,913
Number of states traveled through	4	1	6
States traveled through	TX, NM, CO, UT	TX	TX, LA, MS, AL, GA, SC
Approximate total persons within a 1-mile-wide corridor [1]	3,357,319	908,108	2,725,600
Origin	**Mobile, Alabama**		
Destination	EnergySolutions (UT)	WCS (TX)	SRS (SC)
Approximate route miles	2,309	819	496
Number of states traveled through	7	4	3
States traveled through	AL, MS, LA, TX, NM, CO, UT	AL, MS, LA, TX	AL, GA, SC
Approximate total persons within a 1-mile-wide corridor[1]	3,119,511	1,468,674	923,975

[1]Population estimates are provided for comparative analysis and were derived from the RouteInfo model output from WebTRAGIS analysis. This analysis was in addition to the Radiological Transportation Analysis provided in Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants).

Notes: AL = Alabama, CO = Colorado, GA = Georgia, IA = Iowa, IN = Indiana, IL = Illinois, KY = Kentucky, LA = Louisiana, MO = Missouri, MS = Mississippi, NC = North Carolina, NE = Nebraska, NM = New Mexico, SC = South Carolina, SRS = Savannah River Site, TBD = to be determined, TX = Texas, UT = Utah, VA = Virginia, WCS = Waste Control Specialists, LLC, WV = West Virginia, WY = Wyoming

3.1.1.2 Regulatory Framework

The Proposed Action and alternatives would meet all applicable federal, state, and local health and safety requirements. Navy, Naval Nuclear Propulsion Program (NNPP), and/or Nuclear Regulatory Commission (NRC) health and safety management practices would also be invoked consistent with ongoing industrial work under those authorities.

Private shipyards such as Newport News Shipbuilding, public shipyards such as PSNS & IMF, and commercial ship dismantlement facilities meet applicable health and safety requirements of Occupational Health and Safety Act (29 United States Code [U.S.C.] Section 651 et seq.). For the

No Action Alternative and the reactor compartment packaging alternatives, radiological work would be conducted under NNPP standards and regulations under the Atomic Energy Act (42 U.S.C. Section 2011 et seq.)

For Alternative 3 (Preferred Alternative), the Navy envisions contractually invoking NRC standards and obtaining NRC oversight via an interagency support agreement to accomplish the dismantlement of ex-Enterprise. The Navy would retain regulatory authority and contractually support use of the NRC requirements. The NRC would review project planning and engineering documents, conduct oversight of project execution, and provide the Navy recommendations for enforcement with the dismantlement contractor. The reactor plants and other LLRW from the ship would be packaged and disposed of as LLRW in accordance with applicable local, state, and federal laws. Non-radiological hazards, including occupational safety and health, Resource Conservation and Recovery Act hazardous materials, polychlorinated biphenyls (PCBs), and asbestos containing materials (ACM), would be regulated in the same manner that these hazards are regulated in conventionally powered ship dismantlement and recycling. Navy conventionally powered aircraft carriers similar in size to ex-Enterprise are currently being dismantled in Brownsville, Texas. Since the *Final Environmental Assessment on the Disposal of Decommissioned, Defueled Naval Reactor Plants from USS Enterprise (CVN 65)* (Navy & DOE, 2012) (hereinafter referred to as the 2012 EA), four such Navy conventionally powered aircraft carriers have been dismantled. A partnership between commercial ventures located at a facility that can dismantle conventional carriers is envisioned for this alternative. Ex-Enterprise would be towed to one of three commercial locations (the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama) for dismantlement. Dismantlement includes disassembly of the eight defueled reactor plants for packaging into several hundred small containers that meet applicable NRC, U.S. Department of Transportation (DOT), and DOE transportation requirements for disposal at a DOE or authorized NRC) agreement state commercial LLRW facility. Non-radioactive portions of the ship would be recycled or disposed of in accordance with applicable, local, state, and federal laws.

While the Navy envisions using NRC standards and oversight to accomplish the dismantlement of ex-Enterprise under this alternative, the Navy could also use established NNPP requirements for performing radiological work.

3.1.1.3 Relevant Federal Regulations and Best Management Practices for Protecting Health and Safety

3.1.1.3.1 U.S. Occupational Safety and Health Act of 1970 (29 United States Code Section 651 et seq.)

The Occupational Safety and Health Act establishes standards for safe and healthful working conditions in places of employment throughout the United States. This act is administered and enforced by the Occupational Safety and Health Administration (OSHA), a U.S. Department of Labor agency. Section 4(b)(1) of this act exempts DOE and its contractors from the occupational safety requirements of OSHA. The regulations and standards governing general industry are provided in 29 Code of Federal Regulations (CFR) Part 1910. For ship repair, shipbuilding, and shipbreaking, regulations and standards are provided in 29 CFR Part 1915. The DOE and NNPP have established their own occupational safety and health programs for facilities and activities authorized pursuant to the Atomic Energy Act as provided in 42 U.S.C. Section 2201. The standards under these programs are generally consistent with those prescribed by OSHA.

3.1.1.3.1.1 29 Code of Federal Regulations Parts 1910.15 and 1915 – Occupational Safety and Health Standards for Shipyard Employment

29 CFR Part 1915 applies to all ship repairing, shipbuilding, and shipbreaking employments and related employments. It is amplified by 29 CFR Part 1910.15 (a), which "adopt[s] and extend[s] established safety and health standards for Shipyard employment," making clear that those involved in shipyard-type employment must "protect the employment and places of employment of each of his employees." Part 1915 also includes standards for exposures to toxic and hazardous substances (Subpart Z) such as asbestos (Part 1915.1001), lead (Part 1915.1025), chromium (VI) (Part 1915.1026), and others.

3.1.1.3.1.2 Department of Defense

U.S. Department of Defense Instruction 6055.01, Department of Defense Safety and Occupational Health Program, provides policy and outlines responsibilities for the implementation of the total Navy Safety and Occupational Health Program. The Navy program encompasses all safety disciplines such as aviation safety, weapons and explosives safety, off-duty safety, traffic safety, and occupational safety and health. The Chief of Naval Operations Instruction 5100.23, *Navy Safety and Occupational Health Program Manual*, covers the implementation of the Occupational Safety and Health Program. Towing operations for Alternatives 1, 2, and 3 would be performed in accordance with established instructions as referenced in the Navy Towing Manual (Navy, 2002) and Naval Sea Systems Command Instruction (NAVSEAINST) 4740.12 (Navy, 2012).

3.1.1.3.2 Atomic Energy Act (42 United States Code Section 2011 et seq.)

The Atomic Energy Act of 1954, as amended, authorizes DOE, the Nuclear Regulatory Commission, and the Environmental Protection Agency to issue regulations and establish standards for utilizing atomic energy for peaceful purposes consistent with public health and safety. Some associated regulations include 10 CFR Part 20 (Standards for Protection Against Radiation), 10 CFR Part 71 (Packaging and Transportation of Radioactive Material), and 10 CFR Part 835 (Occupational and Radiation Exposure). For NNPP activities, this authority within DOE is assigned to the NNPP by the National Nuclear Security Administration (50 U.S.C. 2401 et seq.).

3.1.1.3.2.1 Naval Nuclear Propulsion Program

As described in Section 3.1.1.2 (Regulatory Framework), the NNPP has responsibility for all matters pertaining to naval nuclear propulsion, from design through disposal, including prescribing and enforcing standards and regulations for the control of radiation and radioactivity associated with naval nuclear propulsion activities as they affect the environment and the safety and health of workers, operators, and the general public. NNPP procedures for protection of people and the environment meet or exceed all applicable federal, state, and local environmental, health, and safety laws and regulations. Additional information on NNPP policy and limits on radiation exposures is provided in Appendix E (Radiological Evaluation of Reactor Plant Disposal Alternatives).

3.1.1.3.2.2 Department of Energy

DOE Worker Safety and Health Program (10 CFR Part 851) supports line management and contractors through the development and dissemination of policy, guidance, and technical expertise to assist in implementation of the policies. These programs and resources assist in recognizing and responding to safety and health concerns, focus on value-added activities, and conserve Departmental resources.

Requirements for DOE Federal Employees Occupational Safety and Health program are contained in DOE Orders 440.1B and 341.1A, and DOE Order 442.1B.

3.1.1.3.2.3 U.S. Nuclear Regulatory Commission

For radiological work conducted by a commercial company under Alternative 3 (Preferred Alternative), the Navy envisions contractually invoking NRC regulatory requirements consistent with requirements normally invoked on the commercial radiological dismantlement industry for this type of work. The Navy would retain regulatory authority and contractually support use of the NRC requirements. The NRC would review project planning and engineering documents, conduct oversight of project execution, and provide the Navy recommendations for enforcement with the dismantlement contractor. Additionally, dismantlement of ex-Enterprise under Alternative 3 (Preferred Alternative) would be conducted in compliance with NRC regulations for radionuclide air emissions consistent with NRC and U.S. Environmental Protection Agency (EPA) agreements (NRC Reg Guide 4.20, 2012).

3.1.1.3.3 U.S. Environmental Protection Agency

The EPA has the responsibility for establishing generally applicable standards for the protection of human health and the environment from pollutants, including radioactive and hazardous materials. EPA standards set protective limits for pollutants in soil, water, and air. The Clean Air Act requires the EPA to regulate airborne emissions of hazardous air pollutants. Standards known as the National Emission Standards for Hazardous Air Pollutants dictate specific regulatory limits for source categories that are known or suspected to cause cancer or other serious health effects, including radioactive materials and asbestos. This Clean Air Act authority to regulate airborne radionuclides is in addition to Atomic Energy Act regulatory authority.

3.1.1.3.3.1 40 Code of Federal Regulations Part 61 – National Emission Standards for Hazardous Air Pollutants

40 CFR Part 61 is an EPA standard that is applicable within the United States to the emissions of hazardous air pollutants produced by corporations, institutions, and agencies at all levels of government.

3.1.1.3.3.2 40 Code of Federal Regulations Part 61, Subpart H – National Emission Standards for Emission of Radionuclides other than Radon from Department of Energy Facilities

40 CFR Part 61, Subpart H, protects the public and the environment from radionuclide emissions other than radon from the DOE facilities. It sets a limit on the emission of radionuclides so that no member of the public would receive an effective dose equivalent of more than 10 millirem (mrem) per year. This would apply to waste transport and disposal activities at the DOE Hanford Site associated with the reactor compartment packaging alternatives and the disposal of radioactive wastes at the DOE SRS under Alternative 3 (Preferred Alternative).

3.1.1.3.3.3 40 Code of Federal Regulations Part 61, Subpart I – National Emission Standards for Radionuclide Emissions from Federal Facilities other than Nuclear Regulatory Commission Licensees and Not Covered by Subpart H

40 CFR Part 61, Subpart I protects the public and the environment from radionuclide emissions released from federal facilities that are not regulated elsewhere. Subpart I would be applicable under the reactor compartment packaging alternatives as the dismantlement work involving radioactive materials would be performed at a federal facility and not under an NRC license. This would not be applicable to Alternative 3 (Preferred Alternative) because dismantlement activities involving radioactive materials would be conducted at a commercial facility.

3.1.1.3.3.4 40 Code of Federal Regulations Part 61, Subpart M – National Emission Standards for Asbestos

40 CFR Part 61, Subpart M requires a thorough asbestos inspection where the demolition or renovation operation occurs, and work practice standards that control asbestos emissions. Work practices often involve removing all ACM, adequately wetting all regulated ACM, sealing the material in leak-tight containers, and disposing of the asbestos-containing waste material as expediently as practicable.

3.1.1.3.3.5 40 Code of Federal Regulations Part 300 – National Oil and Hazardous Substances Pollution Contingency Plan

The National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan, is the plan of the federal government for responding to both oil spills and hazardous substance releases to protect human health and the environment. This plan is the result of efforts to develop a national response capability and promote coordination among the hierarchy of responders and contingency plans. 40 CFR Part 300.110 establishes the National Response Team and its roles and responsibilities in the National Response system. This includes planning and coordinating responses, providing guidance to Regional Response Teams, coordinating a national program of preparedness planning and response, and facilitating research in support of response activities. The EPA serves as the lead agency within the National Response Team.

3.1.1.4 Approach to Analysis

This EIS/OEIS evaluates the potential public and occupational health and safety impacts resulting from the Proposed Action and alternatives. The following sections evaluate public exposure to radiation offsite, dismantlement and decommissioning health and safety impacts on workers, and health and safety effects associated with radioactive waste transport under the three alternatives. Additional information on the effects of hazardous materials and hazardous waste, including radioactive and low-level mixed waste, is provided in Section 3.2 (Hazardous and Radioactive Waste Management) of this EIS/OEIS.

3.1.2 Affected Environment

The Proposed Action and alternatives would be completed by trained workers. Workers would be adequately trained to ensure work is conducted in a manner to protect the safety for workers and the public, to handle and process hazardous or radioactive materials in accordance with established regulatory requirements, and to minimize effects on the regional population.

Under the No Action Alternative, ex-Enterprise would remain at its current location in Newport News, Virginia in waterborne storage. The affected environment associated with its current location in Virginia includes Navy and contractor personnel working to prepare ex-Enterprise for movement from Newport News, Virginia. Under each action alternative, ex-Enterprise would be towed from its current location to a separate commercial dismantlement location near Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama (see Table 3.1-1). The affected environment associated with its current location in Virginia includes Navy and contractor personnel working to maintain the ship in its current waterborne storage and to prepare ex-Enterprise for movement from Newport News, Virginia. Towing of unmanned, defueled, nuclear-powered ships is governed by the Navy Towing Manual (Navy, 2002) and NAVSEAINST 4740.12 (Navy, 2012).

Where the Navy does not have jurisdiction within individual ports, the U.S. Coast Guard and the Port Authority (or similar office) maintain health and safety and emergency response plans for the port area. They are often responsible for inspecting commercial ships for compliance with federal laws and

regulations; responding to oil spills and hazardous material releases into the marine environment; enforcing safety and security zones; and investigating marine accidents such as collisions, groundings, and fires. Ship movements in port areas, including ships under tow or under control of the Port Pilots, must comply with these regulations.

Under the reactor compartment packaging alternatives, the propulsion space section would be separated from ex-Enterprise at a commercial dismantlement facility in Virginia, Texas, or Alabama and would be transported to PSNS & IMF via heavy-lift ship. The propulsion space section from ex-Enterprise is about one-third of the original weight and size of the ship and is approximately 376 feet (ft.) long and 28,000 long tons displacement. Ex-Enterprise is 1,041 ft. long, 133 ft. wide at the water line (Naval Vessel Register, 2017). The current displacement of ex-Enterprise is about 75,000 long tons. The potential heavy-lift ship transportation routes are described in Table 3.1-1.

At PSNS & IMF, all operations are governed by the Navy Safety and Occupational Health program and Chief of Naval Operations Instruction 5100.23G, *Navy Safety and Occupational Health Program Manual*. PSNS & IMF personnel are trained in the hazards applicable to their work and how to minimize these hazards. Personnel are routinely monitored for exposure to certain hazards (e.g., high noise levels, lead, and asbestos) and then placed into medical surveillance programs for the applicable physical or chemical hazard. Section 3.2 (Hazardous and Radioactive Waste Management) of this EIS/OEIS provides additional discussion on management of hazardous materials encountered with ex-Enterprise. Contractors at Navy and commercial sites would be subject to OSHA health and safety regulations.

The reactor compartment packaging alternatives would also involve transportation of the reactor compartment packages from PSNS & IMF by water to the Port of Benton barge slip and then by road to Trench 94 at the DOE Hanford Site. The waterborne transport route (Figure 2-6) for the reactor compartment packages from PSNS & IMF would follow the normal shipping lanes in Sinclair Inlet, through Rich Passage, past Restoration Point, and northerly through Puget Sound. The route is then westerly through the Strait of Juan de Fuca (staying south of the inbound Vessel Traffic System lane when transiting out of the Strait of Juan de Fuca to remain in U.S. waters), around Cape Flattery, south along the Washington coast (staying outside the Olympic Coast Area to be Avoided) to the mouth of the Columbia River. The route then goes up the Columbia River, following the shipping channel used for the regular transport of commercial cargo. The river route passes through the navigation locks at Bonneville, the Dalles Dam, John Day, and McNary dams to the barge slip located in north Richland, Washington, at river mile 342.8 (Navy & DOE, 1996).

The Navy uses the DOE Hanford Site road systems to transport decommissioned, defueled reactor compartment packages from the Port of Benton barge slip to Trench 94 in the 200-East Area. Under Alternative 1, single reactor compartment packages would be transported from the barge slip to Trench 94 at the DOE Hanford Site using the same process used for the current program (Navy & DOE, 2012). The route begins at the barge slip and enters the DOE property at Horn Rapids Road. Once on the DOE Hanford Site, the route covers about 26 miles (mi.) to the disposal site (Navy & DOE, 1996).

Road and Port of Benton barge slip modification work would be required to accommodate the larger dual reactor compartment packages under Alternative 2. Construction of a concrete rail support system in Trench 94 at the DOE Hanford Site would be required for both reactor compartment packaging alternatives. DOE *Worker Safety and Health Program* (10 CFR Part 851) provides the requirements for DOE contractor safety and health programs. The *Worker Safety and Health Program* establishes the framework for DOE contractors' non-radiological worker safety and health programs. To accomplish its

objective, the program establishes management responsibilities, rights of workers, required safety and health standards, and training for the hazards of their jobs, as well as how to control the hazards. Additionally, federal employees are protected under the Occupational Safety and Health programs of Federal Employees, which are mandated by 29 CFR Part 1960, Section 19 of OSHA, and Executive Order 12196. Requirements of DOE Occupational Safety and Health program for Federal Employees are contained in DOE Orders 440.1B and 341.1A, and DOE Order 442.1B.

Under Alternative 3 (Preferred Alternative), the affected environment includes contractors and the public associated with the initial tow routes described in Table 3.1-1, the project location, and waste transportation routes. The affected environment in each of the potential dismantlement locations in Virginia, Texas, and Alabama include contractors and Navy personnel at the commercial dismantlement facilities, and the communities surrounding the facilities. Contractors would be subject to OSHA health and safety regulations as well as applicable NRC regulations incorporated into the contract. The Navy estimates that dismantlement of all eight reactor plants under Alternative 3 (Preferred Alternative) would conservatively result in up to 440 shipments of large components and container express (CONEX) boxes or similarly sized packages of low-level radioactive waste being shipped by barge, rail, or truck to one or more waste facilities for disposal. Dismantlement activities would also generate a small number of additional shipments of LLRW incidental to disposal of the reactor plants, which would consist of material such as piping, tooling, and personal protective equipment. These additional wastes are similar to the small amounts of LLRW that are generated incidental to construction of reactor compartment packages and are disposed of at established waste disposal sites. Dismantlement waste shipments would also include hazardous materials, ACM, and PCB bulk waste, as is typical for the dismantlement of Navy ships.

The trucking routes from each location to EnergySolutions, Waste Control Specialists, LLC (WCS), and SRS are summarized in Table 3.1-2.

3.1.3 Environmental Consequences

The Proposed Action and alternatives, other than the No Action Alternative, have similar environmental consequences regarding health and safety. Work at commercial dismantlement facilities in Virginia, Texas, and Alabama would be governed by the same federal and similar state regulations to ensure minimal impacts on health and safety. The reactor compartment packaging alternatives require additional dismantlement operations at PSNS & IMF, which is governed by federal and state environmental, health, and safety regulations as well as Navy regulations. Potential impacts of the No Action Alternative and those that are common to Alternatives 1, 2, and 3 that may affect the public or the environment are discussed in this section. A general discussion of radiation and radiation exposures and an evaluation of exposures associated with the reactor plant disposal alternatives is provided in Appendix E (Radiological Evaluation of Reactor Plant Disposal Alternatives).

3.1.3.1 No Action Alternative

3.1.3.1.1 Ex-Enterprise Is Stored in Newport News, Virginia

The No Action Alternative involves continued long-term waterborne protective storage of the entire ex-Enterprise for an indefinite period of time at Newport News Shipbuilding in Newport News, Virginia. Under the No Action Alternative, ex-Enterprise would require periodic maintenance to ensure that storage continues in a safe and environmentally responsible manner. Newport News Shipbuilding currently performs reactor plant work on Navy ships. Ex-Enterprise was constructed, serviced, and decommissioned at Newport News Shipbuilding.

Ship preparations for storage would include installing fire and flood alarm systems, a corrosion prevention system (impressed current cathodic protection), and dehumidification systems. Storage facility staff would perform periodic inspections and maintenance of the ship while in storage, to include a detailed interior inspection annually, an underwater exterior inspection of the hull every eight years, and placing the ship in dry dock for inspection and repair every 15 years. Releases of hazardous or radioactive materials to the environment as a result of the No Action Alternative are not expected. Additionally, there would be no risk of highway accidents or radiation doses associated with the transport of radioactive materials under the No Action Alternative.

With current environmental, health, and safety procedures in place governing Navy contract work at Newport News Shipbuilding, the impacts of the No Action Alternative would be minimal. This alternative is not addressed in further detail.

3.1.3.2 Alternative 1: Single Reactor Compartment Packages

3.1.3.2.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

Alternative 1 includes towing ex-Enterprise to a location where partial dismantlement would occur at one of the three locations in Alabama, Texas, or Virginia. The tow action of unmanned, defueled, nuclear-powered ships is governed by the methods and procedures described in the Navy Towing Manual (Navy, 2002) and NAVSEAINST 4740.12 (Navy, 2012). Compliance with these and other applicable maritime regulations governing safety would ensure that the tow is executed in a manner designed to have minimal impact on public and occupational health and safety.

The National Institute for Occupational Safety and Health (NIOSH) reports on the hazards of tug and tow boats, barges, container ships, bulk cargo ships, and ferry and cruise passenger ships (NIOSH, 2020). NIOSH reports that physical hazards include noise levels, vibration, ultraviolet light exposure from sunlight, line handling, heavy lifting, slippery surfaces, steep ladders, and narrow passageways. The physical hazards can be exacerbated by severe weather conditions. Chemical hazards include exposures to chemical cargos, fuel, cleansers, and diesel exhaust. Biological hazards include transmission of contagious diseases between coworkers and travel-related infections. NIOSH also reports that psychosocial hazards remain a significant challenge for the workforce involved in maritime work. These hazards that can impact the health of the workers include social isolation, substance abuse, low job control/high demand, and harassment/bullying.

NIOSH reports that the U.S. Bureau of Labor Statistics recorded that there were approximately 62,000 workers in the U.S. water transportation industry in 2017, with inland waterways representing approximately 26,000 workers, while deep sea, coastal, and Great Lakes water transportation represent approximately 36,000 workers (NIOSH, 2018). NIOSH also summarizes that from 2011 through 2017, there were 87 fatal injuries (18.4 per year per 100,000 workers) among marine transportation workers, nearly six times the rate of all U.S. workers. Studies show a high burden of fatalities due to cardiovascular conditions, work accidents, drownings (including from ship disasters), suicides, and workplace violence. In the same time period, approximately 11,000 nonfatal occupational injuries occurred.

Maritime transportation work has inherently more risk of injury than many land-based occupations. However, federal safety regulations are in place to mitigate the impacts and reduce work-related injuries and illnesses. The Proposed Action and alternatives would conform to existing maritime transportation operations and procedures designed to protect workers. Therefore, the occupational safety and health impacts from maritime transportation would be minimal.

Air pollutants would be generated from transport ships. However, emissions of air pollutants from these mobile sources would meet applicable requirements and therefore would have a minimal impact on public health within the areas surrounding the tow route.

For commercial ports, the U.S. Coast Guard and the Port Authority, or similar office, would also maintain health and safety plans as well as emergency response plans for the port area. The relevant authorities (e.g., U.S. Coast Guard) are responsible for inspecting commercial ships for compliance with federal laws and regulations; responding to oil spills and hazardous material releases into the marine environment; enforcing safety and security zones; and investigating marine casualties such as collisions, groundings, and fires. Ship movements in port areas, including ships under tow or under control of the port pilots, must comply with these regulations. As such, impacts on public health and safety would be minimal.

3.1.3.2.2 Partial Dismantlement at Commercial Dismantlement Facility (Includes In-Water Activities)

Partial dismantlement under Alternative 1 includes dividing the aircraft carrier into sections and constructing a separate propulsion space section that is about one-third of the original weight and size of the aircraft carrier. By utilizing a commercial facility to dismantle and recycle or dispose of the areas of the ship outside the propulsion space section, this alternative would result in only the propulsion space section being delivered to PSNS & IMF.

NIOSH describes the occupational hazards for shipyard workers (NIOSH, 2020). These hazards, which would be present at Navy and commercial facilities, include chemical hazards, such as exposure to asbestos, welding fumes, paints, solvents, and fuels. There are also physical hazards such as noise exposure, extreme temperatures, vibration, and the risk of musculoskeletal injuries. Hot work, confined space entry, exposure to hazardous air, awkward body positions, and elevated work all increase the risk of injury. Shipyard workers may work above water while a ship is docked, introducing a fall hazard that may lead to drowning. As provided in Section 3.1.1.2 (Regulatory Framework), OSHA regulates shipyard work under 29 CFR Part 1915, *Occupational Safety and Health Standards for Shipyard Employment*. Where and when necessary, shipyard workers wear personal protective equipment such as chemical-resistant clothing, respirators, and personal flotation devices, to protect against chemical and physical hazards.

NIOSH also describes the chronic illnesses that can affect shipyard workers. Chronic illnesses, including respiratory illness caused by fume and smoke inhalation, and exposure to heavy metals such as lead, are of particular concern in shipyard workers. Excess cancer morbidity has been detected in several groups of shipyard workers, especially cancers of the respiratory system, with welders appearing at particular risk (NIOSH, 2020). Another study found an increased risk of leukemia in electricians and welders working in a naval shipyard (Stern et al., 1986).

NIOSH reports that 2017 Bureau of Labor Statistics provided that there were approximately 165,000 shipyard workers employed in the United States in 26 states (NIOSH, 2020). These statistics also showed that at least 45 fatalities occurred between 2011 and 2017 (about four per year per 100,000 workers). An estimated 61,600 nonfatal injuries/illnesses occurred during the same period (5,370 per year per 100,000 workers).

Federal safety regulations are in place to mitigate the impacts and reduce work-related injuries and illnesses. Because ex-Enterprise dismantlement scope of work is consistent with routine shipyard operations, the additional occupational safety and health impacts would be minimal. Additionally, actions would comply with a site-specific Radiation Protection Program in order to minimize all radiation exposures to both workers and the public.

As reported in NUREG-0586 (NRC, 2002), the most common non-fuel-related accidents that involve radioactive material during the dismantlement of commercial nuclear power plants are fires (20 total accidents from 12 different plants). A fire may be one of the more important accidents to consider for nuclear-powered ship disposal as well because of the large loading of combustible material, including LLRW. A fire could result in the uncontrolled release of radioactive or other hazardous materials. Therefore, a robust fire protection program would be implemented to manage fire safety.

For limited activities necessary to construct the propulsion space section, dismantlement and disposal work would be conducted in accordance with NNPP requirements. The work would be completed by trained workers experienced in handling radioactive and hazardous materials in a manner to limit personnel and public exposures. Public exposure to hazardous emissions is expected to be significantly less than that of workers. Public exposure to radiation from this work at levels above pre-existing natural background sources is not expected. The public would be protected from the impact of the dismantlement activities and associated construction activities under Alternative 1 by Navy and contractor compliance with regulatory-required plans and permits and use of best management practices that minimize offsite impacts from air emissions, spills of hazardous materials, runoff, and noise.

Alternative 1 would not generate significant amounts of radioactive waste for transportation from the commercial dismantlement facilities. Non-radioactive hazardous and non-hazardous materials would be transported, treated, disposed of, or recycled at regional facilities in accordance with applicable local, state, and federal laws. Transportation would be in accordance with applicable regulations. Only properly licensed/permitted transporters would be used to transport the waste. Therefore, waste/recycle material generated from the partial dismantlement activities, and the transportation of the materials, is anticipated to have a minimal impact on public and occupational health and safety.

3.1.3.2.3 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

Under Alternative 1, as described in Table 3.1-1, if partial dismantlement of ex-Enterprise takes place at the facility in Hampton Roads Metropolitan Area in Virginia, the heavy-lift ship route of the propulsion space section to PSNS & IMF in Bremerton, Washington, via the Strait of Magellan would be south along the eastern U.S. coast, through the Caribbean Sea, around South America, and north to PSNS & IMF for a total distance of 19,300 nautical miles (nm). If partial dismantlement of ex-Enterprise takes place at a facility in Brownsville, Texas, the heavy-lift ship route of the propulsion space section to PSNS & IMF in Bremerton, Washington, via the Strait of Magellan would be east through the Gulf of Mexico, through the Caribbean Sea, around South America, and north to PSNS & IMF for a total approximate distance of 20,550 nm. If partial dismantlement of ex-Enterprise takes place at a facility in Mobile, Alabama, the heavy-lift ship route of the propulsion space section to PSNS & IMF in Bremerton, Washington, via the Strait of Magellan would be south through the Gulf of Mexico, through the Caribbean Sea, around South America, and north to PSNS & IMF for a total approximate distance of 20,160 nm. While shipyard work and marine transport carry occupational risks that are higher than other occupations, the impacts of Alternative 1 on worker health and safety would be minimal.

As described in Section 3.1.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility), maritime transportation work has inherently more risk of injury than many land-based occupations. However, federal safety regulations are in place to mitigate the impacts and reduce work-related injuries and illnesses. While not common in the maritime transportation industry,

heavy-lift ship transportation of the propulsion space section would conform to existing maritime transportation operations and procedures designed to protect workers. Therefore, the occupational safety and health impacts from maritime transportation would be minimal.

Due to the location of ex-Enterprise and its reactor compartments within the ship, radiation doses away from the reactor compartments and on the exterior of the propulsion space section are expected to be negligible. Shipment of the propulsion space section would result in an insignificant radiation dose to crew members and members of the public and impacts on public and occupational health and safety would be minimal.

3.1.3.2.4 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages (No In-Water Work)

As described in Chapter 2 (Description of Proposed Action and Alternatives), Alternative 1 would involve dismantlement of the propulsion space section at PSNS & IMF, separation of reactor compartment pairs, and shipment of the eight single reactor compartment packages using the current Navy process. It could take approximately five years for dry dock activities, including the preparation of reactor compartment packages, to be completed (see Table 2-2). While shipyard work carries unique occupational risks as described in Section 3.1.3.2.2 (Partial Dismantlement at Commercial Dismantlement Facility [Includes In-Water Activities]), the impacts on public health and safety from Alternative 1 are considered minimal. Hazardous material exposure controls and radiological controls for work performed by the NNPP at PSNS & IMF and other Navy shipyards are stringently enforced. The NNPP conducted a risk evaluation of occupational radiation exposure from naval nuclear power plants and their associated facilities, including shipyards. The evaluation concluded that "risk from radiation exposure associated with naval nuclear propulsion plants is low compared to the risks normally accepted in industrial work and in daily life outside of work" (Navy, 2019b). Various aspects of the NNPP have been reviewed by other government agencies. For example, in 1983, NIOSH conducted an evaluation of the radiological controls program at Portsmouth Naval Shipyard. The conclusions NIOSH reached are listed below. While specific to Portsmouth Naval Shipyard, they could be considered representative of all shipyards in the NNPP.

- The external and internal doses received by NNPP personnel are low compared to current occupational exposure guidelines.
- The probability of unreported accidents/incidents or undocumented exposures is extremely small.
- The radiological controls employed are adequate to protect the worker from internal and external hazards.
- The impact of the radiological work at Portsmouth Naval Shipyard to the surrounding environment is minimal or negligible.
- Nuclear operations at Portsmouth Naval Shipyard are not contributing a significant radiation dose to the general public.

Non-radioactive hazardous waste would be disposed of at appropriately permitted regional disposal site(s). Non-radioactive and non-hazardous materials would be transported and recycled or disposed of at regional facilities in accordance with applicable local, state, and federal laws. Waste/recycle material generated from the partial dismantlement activities, and the transportation of the materials, is anticipated to have a minimal impact on public and occupational health and safety as waste is disposed per the PSNS & IMF Waste Management Plan.

To comply with all federal regulations for air quality, work at PSNS & IMF under the reactor compartment packaging alternatives would comply with PSNS & IMF air permit requirements and the regulations of Puget Sound Air Pollution Control Agency (requiring additional controls and more stringent regulations than federal requirements. Waste facilities utilized under the Proposed Action and alternatives, both federal and commercial, would also meet applicable federal and state regulations regarding the maintenance of air quality.

NNPP, in an annual report titled *Environmental Monitoring and Disposal of Radioactive Wastes from U.S. Naval Nuclear-Powered Ships and their Support Facilities* (Navy, 2019a), assessed the environmental effect of disposal of radioactive wastes originating from U.S. naval nuclear propulsion plants and their support facilities. This report confirms that procedures used by the Navy to control releases of radioactivity from U.S. naval nuclear-powered ships and their support facilities have not had an adverse effect on human health and the environment and that no member of the general public has received measurable radiation exposure as a result of operations of the NNPP. As such, impacts on public health and safety would be minimal.

The dry dock work involving preparation of the reactor compartment packages involves similar shipyard hazards as described in Section 3.1.3.2.2 (Partial Dismantlement at Commercial Dismantlement Facility [Includes In-Water Activities]).

The majority of the occupational radiation exposure would occur during preparation of the reactor compartment packages. As noted in the 2012 EA, the Navy estimates that the collective dose for Alternative 1 would be about 300 person-rem of collective radiation exposure (to the entire workforce involved) to prepare the eight ex-Enterprise reactor compartment packages (Navy & DOE, 2012). This collective dose is estimated over five years (0.12 additional potential latent cancer fatalities). The 1996 *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants*, estimated 25 Roentgen equivalent man (rem) of collective exposure among the shipyard workforce per cruiser reactor compartment package prepared, for a total of 400 rem of collective exposure for 16 cruiser reactor compartments (Navy & DOE, 1996). Ex-Enterprise reactor compartments are approximately 50 percent larger than the cruiser reactor compartments with additional radioactive material. Therefore, 37.5 person-rem of collective exposure is estimated among the shipyard workforce per ex-Enterprise reactor compartment package prepared, for a total of 300 rem of collective exposure for eight ex-Enterprise reactor compartments. The 300 rem collective dose estimated for ex-Enterprise would be across the work force such that an individual worker's exposure would be typically limited to 0.5 rem per year. History shows that actual exposure could be significantly lower than these estimates (Navy, 2019b), particularly as more reactor compartments are processed and process improvements are incorporated. Additionally, the expected dose and Navy requirements ensure the majority of the workforce would receive less than 0.5 rem per year (Navy & DOE, 2012). For comparison, the average annual radiation dose due to NNPP radioactivity (effective dose equivalent) to an individual Navy shipyard worker in 2018 was 0.016 rem (Navy, 2019b). For perspective, the NRC shows that the average American receives an average of about 0.31 rem per year from natural sources (cosmic, terrestrial, and internal sources) (NRC, 2017). As such, impacts on public health and safety would be minimal.

3.1.3.2.5 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

The construction of a concrete rail support system in Trench 94 would be required to accommodate the reactor compartment packages under Alternative 1. A description of the rail system is provided in

Section 2.3.2.6 (Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site). Construction of the concrete rail support system in Trench 94 would require the management of hazardous materials such as solvents, oils, and fuels. These materials would be managed and disposed of using applicable regulations, site procedures, and best management practices to minimize the impact on human health. Furthermore, the construction of the concrete rail support system in Trench 94 at the DOE Hanford Site would be conducted in accordance with applicable DOE Orders and procedures regarding construction and occupational and public safety. As such, impacts on public health and safety would be minimal.

3.1.3.2.6 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

Alternative 1 would involve transportation of the reactor compartment packages from PSNS & IMF by water to the Port of Benton barge slip and then by road to Trench 94 at the DOE Hanford Site. Under Alternative 1, reactor compartment packages would be transported from PSNS & IMF by water to the barge slip using the same process used for the current program (Navy & DOE, 2012) as described in Section 2.3.2.7 (Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip).

Risks associated with water transport are discussed in Section 3.1.3.2.1 (Tow ex-Enterprise from Newport News, Virginia to Commercial Dismantlement Facility). Regarding radiation exposure during package transport, the Navy has calculated an average transport index of 2.2 (equal to 2.2 mrem per hour at 1 meter from the package exterior) for past reactor compartment packages, and ex-Enterprise packages would be expected to not exceed this average. Thus, radiation levels on the exterior of the reactor compartment packages for transport are expected to be negligible. Therefore, shipment would result in an insignificant radiation dose to crew members and the public.

Table F-4 in Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants) of this EIS/OEIS presents the maximum reasonably foreseeable impact, expressed as dose and latent cancer fatalities, to the public and transport crews regarding radioactive waste transport for the Proposed Action and alternatives. This analysis considers the transportation of reactor compartment packages from PSNS & IMF to the DOE Hanford Site under the reactor compartment packaging alternatives. Further details are provided in Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants). Table F-4 demonstrates that impacts on public health and safety are minimal.

3.1.3.2.7 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

Under Alternative 1, reactor compartment packages would be transported from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site using the same process used for the current program (Navy & DOE, 2012) as described in Section 2.3.2.8 (Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site). The route begins at the barge slip and enters the DOE property at Horn Rapids Road. Once on the DOE Hanford Site, the route covers about 26 mi. to the disposal site (Navy & DOE, 1996). Radiation exposure would be minimal for the same reasons as described in Section 3.1.3.2.6 (Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip), in that the expected dose outside the package would be low and the configuration of the transport vehicle would increase distance of personnel from the exterior of the package.

Additionally, these materials would be managed and disposed of using applicable regulations, site procedures, and best management practices to minimize the impact to human health. As described in Section E.2.8 (Transportation of Radioactive Material) of Appendix E (Radiological Evaluation of Reactor Plant Disposal Alternatives), radiation exposures during transportation would be minimal. Hazardous materials present during transportation would be managed and disposed of using applicable local, state, and federal regulations. Furthermore, the land transportation would be conducted in accordance with applicable NRC, DOT, and DOE regulations regarding transportation security and safety. As such, impacts on public health and safety would be minimal.

3.1.3.3 Alternative 2: Dual Reactor Compartment Packages

3.1.3.3.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

Alternative 2 includes towing ex-Enterprise to a location where partial dismantlement would occur at one of three commercial facilities in Alabama, Texas, or Virginia, as described in Section 3.1.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility). Compliance with the Navy Towing Manual and other applicable maritime regulations governing safety would ensure that the tow is executed in a manner designed to have minimal impact on public and occupational health and safety.

3.1.3.3.2 Partial Dismantlement at Commercial Dismantlement Facility (Includes In-Water Activities)

Partial dismantlement under Alternative 2 includes dividing the aircraft carrier into sections and constructing a distinct propulsion space section that is about one-third of the original weight and size of the aircraft carrier, as described in Section 3.1.3.2.2 (Partial Dismantlement at Commercial Dismantlement Facility [Includes In-Water Activities]). As such, impacts on public health and safety would be minimal.

3.1.3.3.3 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

Under Alternative 2, as described in Section 3.1.3.2.3 (Ship ex-Enterprise via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility [Following Route Around South America]) and Table 3.1-1, ex-Enterprise propulsion space section would be shipped via heavy-lift ship from the chosen commercial dismantlement facility to PSNS & IMF following a route around South America. As such, impacts on public health and safety would be minimal.

3.1.3.3.4 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Four Dual Reactor Compartment Packages (No In-Water Work)

The impacts on public health and safety from occupational hazards and public exposures to radioactive materials under Alternative 2 are similar to those described in Section 3.1.3.2.2 (Partial Dismantlement at Commercial Dismantlement Facility [Includes In-Water Activities]). Therefore, the impacts on public health and safety from Alternative 2 are considered minimal. See Section 3.1.3.2.4 (Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages [No In-Water Work]) for further evaluation.

As described in Section 2.3.3.6 (Port of Benton Barge Slip Modifications), Alternative 2 would involve dismantlement of the propulsion space section at PSNS & IMF, separation of reactor compartment pairs, and shipment of the collective four dual reactor compartment packages using the current Navy process. The occupational dose for Alternative 2 would be lower than Alternative 1 as there would be less work

associated with preparing four reactor compartment packages rather than eight. As noted previously, the Navy estimates that the collective occupational dose for Alternative 1 would be 300 person-rem across the workforce. Additionally, NNPP requirements manage worker exposure to 0.5 rem per year (Navy & DOE, 2012). Furthermore, the average annual radiation dose due to NNPP radioactivity (effective dose equivalent) to an individual Navy shipyard worker in 2018 was 0.016 rem (Navy, 2019b). For perspective, the NRC shows that the average American receives an average of about 0.31 rem per year from natural sources (cosmic, terrestrial, and internal sources) (NRC, 2017). As such, impacts on public health and safety would be minimal. Additional information on radiation dose and cancer risk is provided in Appendix E (Radiological Evaluation of Reactor Plant Disposal Alternatives).

3.1.3.3.5 Port of Benton Barge Slip Modifications

Alternative 2 would require infrastructure modifications to the Port of Benton barge slip and the improvements to the transport route to the DOE Hanford Site because of the heavier weight and larger size of the dual reactor compartment packages as compared to the eight single reactor compartment packages in Alternative 1, as described in Section 2.3.3.6 (Port of Benton Barge Slip Modifications). Infrastructure modifications would involve widening and lengthening the barge slip, inland pile driving, and concrete work. These activities add to the potential for occupational accidents and injuries. However, work would be conducted in accordance with applicable federal and state regulations regarding occupational health and safety and protection of the public. As such, impacts on public health and safety would be minimal.

3.1.3.3.6 Road Improvements Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site

Road improvement work and the construction of a concrete rail support system in Trench 94 at the DOE Hanford Site would be required to accommodate the larger dual reactor compartment packages under Alternative 2, as described in Section 2.3.3.7 (Road Improvements Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site). Infrastructure improvements would involve construction of a concrete rail support system in Trench 94 at the DOE Hanford Site, and improvements of the transport route. These activities add to the potential for occupational accidents and injuries. However, work would be conducted in accordance with applicable DOE Orders and procedures as well as applicable federal and state regulations regarding occupational health and safety and protection of the public. As such, impacts on public health and safety would be minimal.

3.1.3.3.7 Install Rail System For Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

As described for Alternative 1 in Section 3.1.3.2.5 (Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site), the construction of a concrete rail support system in Trench 94 would be required to accommodate the reactor compartment packages under Alternative 2. A description of the rail system is provided in Section 2.3.2.6 (Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site). Construction of the concrete rail support system in Trench 94 would require the management of hazardous materials such as solvents, oils, and fuels. These materials would be managed and disposed of using applicable regulations, site procedures, and best management practices to minimize the impact on human health. Furthermore, the construction of the concrete rail support system in Trench 94 at the DOE Hanford Site would be conducted in accordance with applicable DOE orders and procedures regarding construction and occupational and public safety. As such, impacts on public health and safety would be minimal.

3.1.3.3.8 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

Under Alternative 2, the transportation route of the four dual reactor compartment packages from PSNS & IMF by water to the Port of Benton barge slip is described in Section 3.1.3.2.6 (Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip), similar to Alternative 1.

Risks associated with water transport are discussed in Section 3.1.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility). Regarding radiation exposure during package transport, radiation levels exterior to the packages would be consistent with those described in Section 3.1.3.2.6 (Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip). As such, impacts on public health and safety would be minimal.

3.1.3.3.9 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

Similar to Alternative 1, under Alternative 2, reactor compartment packages would be transported from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site, using the same process used for the current program (Navy & DOE, 2012) as described in Section 2.3.2.8 (Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site). The transport route is described in Section 3.1.3.2.7 (Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site). As described in Section E.2.8 (Transportation of Radioactive Material) of Appendix E (Radiological Evaluation of Reactor Plant Disposal Alternatives), radiation exposures during transportation would be minimal. Hazardous materials present during transportation would be managed and disposed of using applicable local, state, and federal regulations. Furthermore, the land transportation would be conducted in accordance with applicable NRC, DOT, and DOE regulations regarding transportation security and safety. As such, impacts on public health and safety would be minimal.

3.1.3.4 Alternative 3 (Preferred Alternative): Commercial Dismantlement

3.1.3.4.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

Alternative 3 (Preferred Alternative) includes complete dismantlement at a commercial facility located in the general vicinity of Newport News Shipbuilding (with no open-water tow) or towing ex-Enterprise from Newport News Shipbuilding in Newport News, Virginia, to a location in either Alabama or Texas. The analysis and conclusions described in Section 3.1.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility) are also applicable to Alternative 3 (Preferred Alternative). Compliance with the Navy Towing Manual and other applicable maritime regulations governing safety would ensure that the tow is executed in a manner designed to have minimal impact on public and occupational health and safety.

3.1.3.4.2 Complete Dismantlement of ex-Enterprise at Commercial Facility (Includes In-Water Work)

Alternative 3 (Preferred Alternative) includes towing ex-Enterprise to a contracted ship dismantlement facility and the complete dismantlement of the ship by a ship dismantlement contractor. The dismantlement work is envisioned to be governed under Navy contract(s) and NRC regulations. Ex-Enterprise dismantlement would include standard commercial practices of cutting or disassembling

reactor plants into segments that can be shipped as oversized components or sized to fit into typical LLRW shipping containers. LLRW would be packaged in accordance with applicable local, state, and federal laws.

Alternative 3 (Preferred Alternative) is modeled after successful and ongoing conventional Navy aircraft carrier dismantlement by contract at commercial facilities, successful and ongoing on-site commercial nuclear power plant decommissioning by contract with nuclear services companies, and successful dismantlement of a U.S. Army barge (STURGIS) containing a defueled nuclear reactor by contract with nuclear services companies at commercial facilities (USACE, 2014). It is anticipated that one or more qualified nuclear services companies would be responsible for removing the reactor plants and other radioactive materials, and would package and ship the radioactive materials to a commercial radioactive waste site in Utah or Texas or to the DOE SRS in South Carolina. Other commercial contractors could participate directly, or be subcontracted, to provide expertise on hazardous materials management and disposal, or other specialty services like crane operations and towing.

Under Alternative 3 (Preferred Alternative), the Navy would expect environmental consequences from radiological work by contractors at commercial facilities in each ROI to have similar effects as those documented at Navy facilities.

For Alternative 3 (Preferred Alternative), the Navy would place a contract to dismantle ex-Enterprise at a commercial facility, and the Navy envisions implementing the NRC decommissioning process for radioactive material licensees described in the NRC Consolidated Decommissioning Guidance (NUREG-1757) with direct support from the NRC.

For the purpose of estimating the collective dose for the commercial dismantlement of ex-Enterprise under Alternative 3 (Preferred Alternative), the workforce and project duration estimates were selected from the commercial dismantlement cost estimate (Chilton et al., 2020). The cost estimate assumes a three-year period. During this period of active dismantlement, the cost estimate also assumes that the main project staff would consist of 90 personnel. This would result in roughly 540,000 person-hours (90 personnel × 2,000 hours per year × 3 years). Multiplying person-hour by an estimated 1 mrem (0.001 rem) per hour average representative dose rate yields a collective dose of 540 person-rem over three years (0.22 additional potential latent cancer fatalities) for Alternative 3 (Preferred Alternative). As an example, the estimated dose on an annual basis for a work force of 90 personnel would be 2 rem per worker per year. Consistent with NRC guidance and requirements, worker doses are kept as low as reasonably achievable, and the estimated dose is less than half the occupational exposure limit of 5 rem per worker per year (10 CFR Part 20). The estimated radiation exposure and work hours for Alternative 3 (Preferred Alternative) include the effort needed to disassemble the reactor plants and structure. For perspective, between calendar year 2020 and calendar year 2022, a radiological services contractor completed size reduction and disposal of the Navy D1G prototype secondary and primary shielding structures. The contractor work hours, personnel exposure (adjusted for decay), and cost to perform the work are similar to those estimated for Alternative 3 (Preferred Alternative).

For comparison to the collective dose estimate for Alternative 3 (Preferred Alternative) described in the previous paragraph, Table 3.1-3 provides collective radiation doses (sum of the doses received for all monitored individuals) from dismantlement of the land-based prototype naval reactor plants; from the defueling and inactivation of ex-Enterprise at Newport News, Virginia; and from the dismantlement of two commercial nuclear power plants. Table 3.1-3 also provides hours worked on the projects, which can be divided into the collective doses to yield equivalent dose rates. Both the collective dose of

540 person-rem and the average dose rate of 1 mrem per hour for Alternative 3 (Preferred Alternative) are within range of the collective doses and average dose rates provided in Table 3.1-3. The nature of the work conducted in dismantling Prototype 1 (rows 1 and 2 in Table 3.1-3) most closely resembles the range of work that would be required for dismantling ex-Enterprise, and thus provides the best basis for comparison in estimating an average dose rate of 1 mrem/hour and total effort of several hundred thousand hours of labor. Additional information on radiation dose and cancer risk is provided in Appendix E (Radiological Evaluation of Reactor Plant Disposal Alternatives).

Table 3.1-3: Occupation Dose Rates from Comparable Projects

Project	Collective Dose (person-rem)	Hours Worked	Average Dose Rate (mrem/hour)
Navy Prototype 1[1]	8.02	6,200	1.3
Navy Prototype 1[2]	114	>330,000	<0.35
Navy Prototype 2[3]	40.6	14,069	2.9
Navy Prototype 3[4]	92.0	35,457	2.6
Ex-Enterprise defueling & inactivation[5]	134	180,000	0.74
Zion Nuclear Power Plant[6]	422	1.4 million	<0.4
Maine Yankee[7]	Approx. 670	5.4 million	<0.5

[1]Reactor vessel removal and disposal only. The Navy Prototype 1 reactor was smaller than a single ex-Enterprise reactor, but it contained about one-and-one-half times the radioactivity at the time of dismantlement.
[2]Entire facility dismantlement. Hours worked are for direct craft labor only.
[3]Reactor vessel removal and disposal only. The Navy Prototype 2 reactor was smaller than a single ex-Enterprise reactor, but it contained about 10 times the radioactivity at the time of dismantlement.
[4]Reactor vessel removal and disposal only. The Navy Prototype 3 reactor was about the same size as a single ex-Enterprise reactor, but it contained about eight times the radioactivity at the time of dismantlement.
[5]For defueling all eight ex-Enterprise reactor plants.
[6]Total dose for dismantlement of two 1,000-megawatt commercial nuclear power plants; dose includes lower radiation general cleanup and building demolition work; 2010 through 2020 (NUREG-0713, Vol. 42, Appendix C).
[7]Total dose for dismantlement of a single 900-megawatt commercial nuclear power plant containing, at the time of dismantlement, a total activity about 24 times the activity as ex-Enterprise; dose rate is reduced by inclusion of work hours for low radiation general cleanup and building demolition work.
Notes: rem = Roentgen equivalent man, NRC = Nuclear Regulatory Commission, mrem = millirem.

Much of the work under Alternative 3 (Preferred Alternative) involves conventional shipbreaking activities. Public and occupational safety impacts of Alternative 3 (Preferred Alternative) are therefore consistent with those described in Section 3.1.3.2.2 (Partial Dismantlement at Commercial Dismantlement Facility [Includes In-Water Activities]) for such activities. The NRC has also assessed the potential impacts of decommissioning activities on occupational health and safety for work involving decommissioning nuclear power plants (NRC, 2002). NRC concluded that occupational health and safety issues associated with physical, chemical, ergonomic, and biological hazards would be small.

As part of its analysis of generic occupational health and issues for decommissioning nuclear power plants, the NRC also examined accidents that could release radioactive material (NRC, 2002). The NRC concluded that the most common accident during dismantlement in a nuclear power plant was fire. The second-most common accidents were related to the handling of radioactive (non-fuel) material such as waste containers, filters, concrete rubble, LLRW, or larger items such as reactor pressure vessels or steam generators (13 accidents identified from five separate plants). The third-most common accidents

were from explosions, which comprised 11 accidents from five separate plants. These accidents included explosion of liquid propane gas from heavy equipment and oxyacetylene explosions during dismantlement, which released high-efficiency particulate air filter contents. The fourth-most common accident was the release of liquid radioactive waste from storage tanks. While types of accidents should be considered as potential causes of accidental releases of radioactive materials during the dismantlement of ex-Enterprise, the NRC concluded that with mitigation procedures in place, the likelihood of non-fuel-related radiological accidents from generic nuclear reactor decommissioning is reduced and the impacts of such accidents, should they occur, would be minimal (NRC, 2002).

The radiological releases from potential accidents associated with these activities may be detectable, although no such releases to the environment outside dismantlement facilities have occurred during the dismantlement of naval reactors to date. Work procedures are designed to minimize both the likelihood of an accident and the consequences of an accident, should one occur. Emergency plans and procedures would remain in place to protect health and safety (NRC, 2002).

3.1.3.4.3 Transport Low-Level Radioactive Waste from Commercial Dismantlement Facility to Approved Waste Disposal Facilities

Ex-Enterprise dismantlement would include standard commercial practices of cutting or disassembling reactor plants into segments that can be shipped as oversized components or sized to fit into typical LLRW shipping containers. The reactor plants and other LLRW would be packaged in accordance with applicable local, state, and federal laws.

The Navy estimates that dismantlement of all eight reactor plants under Alternative 3 (Preferred Alternative) would conservatively result in up to 440 shipments of large components and CONEX boxes or similarly sized packages of low-level radioactive waste being shipped by barge, rail, or truck to one or more waste facilities for disposal. Table F-4 in Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants) of this EIS/OEIS presents the maximum reasonably foreseeable impact, expressed as dose and potential latent cancer fatalities, to the public and transport crews associated with radioactive waste transport for Alternative 3 (Preferred Alternative). Dismantlement activities would also generate a small number of additional shipments of LLRW incidental to disposal of the reactor plants, which would consist of material such as piping, tooling, and personal protective equipment. These additional wastes are similar to the small amounts of LLRW that are generated incidental to construction of reactor compartment packages and are disposed of at established waste disposal sites. Dismantlement waste shipments would also include hazardous materials, ACM, and PCB bulk waste, as is typical for the dismantlement of Navy ships. All shipments would meet applicable NRC, DOT, and DOE shipping requirements.

3.1.3.4.4 Dispose of Low-Level Radioactive Waste at Authorized Disposal Facilities

Under Alternative 3 (Preferred Alternative), it is anticipated that that LLRW would be disposed at WCS in Texas (accepts Classes A, B, and C waste), EnergySolutions in Utah (accepts only Class A waste), or to the DOE SRS in South Carolina.

For Alternative 3 (Preferred Alternative), it is expected that ex-Enterprise reactor vessels (along with their internal structures) would be disposed of as a Class C waste under the NRC regulations (or DOE Category 3 for disposal at the DOE SRS). Disposal options for the reactor vessels based on waste class would then include WCS in Texas and the DOE SRS in South Carolina.

Other large reactor plant components would be Class A waste. The disposal options for these wastes includes WCS in Texas, EnergySolutions in Utah, and the DOE SRS in South Carolina. Approximately 352 CONEX boxes of reactor plant components would also be Class A waste. Other miscellaneous radioactive waste shipments would be expected to be Class A waste. The disposal option of these wastes includes WCS, EnergySolutions, and the DOE SRS.

All waste would be disposed in accordance with NRC, state, or DOE regulations at licensed or permitted disposal facilities. Compliance with the regulations and license/permit requirements ensure impacts on public health and safety would be minimal.

3.1.4 Mitigation

No mitigation measures would be necessary under the Proposed Action and alternatives, including the No Action Alternative, as analysis concluded that the public and occupational health and safety impacts would be considered minimal.

3.1.5 Summary of Impacts and Conclusions

Table 3.1-4 summarizes the effects of the Proposed Action and alternatives on public and occupational health and safety.

Table 3.1-4: Summary of Impacts and Conclusions on Public and Occupational Health and Safety

Potential Impacts on Public and Occupational Health and Safety	Alternatives			
	No Action	1	2	3
Impacts from long-term storage	○			
Impacts from towing to a commercial dismantlement facility		○	○	○
Impacts from dismantlement activities at a commercial dismantlement facility		○	○	○
Impacts from dismantlement activities at PSNS & IMF		○	○	
Impacts from Port of Benton barge slip and road modification work			○	
Impacts from shipping low-level radioactive waste		○	○	○

Notes: (1) Alternatives 1, 2, and 3 would be expected to have some impact that would be reduced as a result of project design changes, implementation of current or proposed best management practices, monitoring, or mitigation. (2) ○ = minimal impact; Blank = no impact/not applicable.

3.2 Hazardous and Radioactive Waste Management

This section of the Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) describes hazardous and radioactive waste management and disposal activities associated with the Proposed Action and alternatives. Section 3.1 (Public and Occupational Health and Safety) of this EIS/OEIS addresses potential public and occupational health and safety effects from exposures to these materials during dismantlement operations and transportation. Waste from ex-Enterprise includes low-level radioactive waste (LLRW), non-radioactive regulated hazardous waste, low-level mixed waste (LLMW), and non-radioactive and non-hazardous waste. LLMW is waste that contains LLRW and hazardous waste. Non-radioactive waste streams, including hazardous waste, would be treated, disposed, or recycled within the general geographic region where dismantlement activities would take place. LLRW and LLMW waste would be managed as described in this section.

All spent nuclear fuel was removed from the eight ex-Enterprise reactor plants in 2017 and dispositioned in accordance with standing National Environmental Policy Act documents for spent fuel (59 Federal Register 79) and the *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (DOE, 1995). Radioactive waste generated from dismantlement under the Proposed Action and alternatives would be LLRW or LLMW. The radioactive waste removed from ex-Enterprise would be disposed of according to federal regulations and applicable state regulations at approved facilities. LLMW would be treated for its regulated hazardous waste components to meet land disposal requirements prior to disposal. Facilities available to the United States (U.S.) Department of the Navy (Navy) for disposal under each alternative of the Proposed Action are addressed in the following sections.

3.2.1 Methodology

3.2.1.1 Region of Influence

The Region of Influence (ROI) includes the population of workers within the region, including workers associated with other projects co-located at the same dismantlement facility, and the local residential population. The ROI also includes the locations of LLRW, non-radioactive hazardous, LLMW, and non-hazardous waste treatment or disposal facilities, including recycling facilities. Radioactive waste disposal facilities are located in/near Richland, Washington; Aiken, South Carolina; Clive, Utah; and Andrews, Texas. Locations of hazardous waste treatment and disposal facilities are discussed in Section 3.2.2.2 (Waste Facilities). Non-radioactive and non-hazardous waste disposal and recycling is assumed to take place within the local region of the dismantlement project. Transportation routes are included in the ROIs associated with public and occupational health and safety, as discussed in Section 3.1 (Public and Occupational Health and Safety).

Under Alternatives 1 and 2 (the reactor compartment packaging alternatives) the ROI of the Proposed Action would include the communities immediately surrounding the commercial dismantlement facilities in Virginia, Texas, or Alabama; Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) in Bremerton, Washington; the Port of Benton barge slip in Richland, Washington; and the DOE Hanford Site near Richland, Washington. The ROI for Virginia is the Hampton Roads Metropolitan Area, Virginia area. The ROI for Texas includes Brownsville, Texas, and the surrounding Cameron, Hidalgo, and Willacy counties. The ROI for Alabama includes Mobile and Baldwin counties. As described in Section 2.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility), the initial transport phase of the reactor compartment packaging alternatives

involves towing ex-Enterprise from its current location in Newport News, Virginia, to one of three commercial locations for partial dismantlement. Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages) describes the routes for shipping the propulsion space section to PSNS & IMF by heavy-lift ship (see Figure 2-5). After reactor compartment packaging at PSNS & IMF, reactor compartment packages would be shipped to the barge slip (see Figure 2-6), and then land-based transportation would be used to move reactor compartment packages to Trench 94 at the DOE Hanford Site. There would also be regional transportation of waste and recycled materials from any commercial dismantlement location and PSNS & IMF.

The ROI for Alternative 3 (Preferred Alternative) is limited to that described for Virginia, Texas, and Alabama; the tow route from Newport News, Virginia, to the commercial dismantlement facility location; regional transportation of waste and recycled materials; and the transportation routes to available LLRW disposal facilities.

3.2.1.2 Regulatory Framework

3.2.1.2.1 Federal

The following sections provide the federal regulatory framework governing Alternatives 1, 2, and 3. Regulations that are also applicable to the No Action Alternative are noted.

3.2.1.2.1.1 Federal and State Radioactive Waste Regulations

Radioactive waste disposal during the dismantlement of ex-Enterprise would be regulated by the DOE, Nuclear Regulatory Commission (NRC), or NRC agreement state as applicable. Under these federal regulations, NRC is responsible for establishing regulations and guidelines for radioactive waste disposal for the commercial nuclear industry, while DOE maintains authority over its wastes. As the Naval Nuclear Propulsion Program (NNPP) does not operate any radioactive waste disposal sites, its radioactive wastes are disposed of at DOE or NRC/Agreement State-regulated radioactive waste disposal locations. Federal radioactive waste regulations would be applicable to Alternatives 1, 2, and 3 (Preferred Alternative) and the No Action Alternative. However, under the No Action Alternative, only small quantities of radioactive waste would be generated as a result of routine maintenance and surveillance operations.

3.2.1.2.1.2 U.S. Department of Energy

DOE regulates the disposal of the radioactive waste under DOE Order 435.1, Change 2, *Radioactive Waste Management* (DOE, 2021). Under the reactor compartment packaging alternatives, the Navy would dispose of ex-Enterprise reactor compartment packages in Trench 94 at the DOE Hanford Site. Trench 94 is owned and operated by DOE. Under the commercial dismantlement alternative, there is potential for using the DOE Savannah River Site (SRS), located near Aiken, South Carolina, for disposal of LLRW. At the DOE SRS, LLRW would be disposed of in the "E Area."

3.2.1.2.1.3 U.S. Nuclear Regulatory Commission

The NRC regulations (10 Code of Federal Regulations [CFR] Part 71) address special packaging requirements for transportation of radioactive materials. The three basic types of packages regulated by the NRC are strong tight containers, whose characteristics are not specified by regulation; and Type A and B packages, which must meet specific requirements in the regulations.

The Low Level Radioactive Waste Policy Amendments Act of 1985 (42 United States Code Section 2021b-j) establishes which commercial LLRW sites would be available for radioactive waste from

ex-Enterprise. Commercial NRC or Agreement state licensed radioactive waste sites are not obligated to accept radioactive waste from the decommissioning of United States naval nuclear-powered ships but are not prohibited from doing so. As such, state compact waste sites may accept waste generated from disposal of ex-Enterprise. The proposed dismantlement alternatives are within states with compacts. The compact or state associated with the disposal sites must agree to import the waste for disposal when these wastes were generated elsewhere.

Radioactive waste classifications are established by the NRC (10 CFR Part 61.55). Class A waste, the lowest of the non-exempt waste classes, is allowed the lowest levels of specific long-lived radionuclides (listed in Tables 1 and 2 of 10 CFR Part 61.55), and is required to meet only the minimum characteristics set forth by the NRC. Class B waste may contain higher levels of radioactivity for the specific long-lived radionuclides but must also meet more rigorous requirements on waste form to ensure stability after land disposal. Class C waste may contain even higher levels of radioactivity for the specific long-lived radionuclides, must meet more rigorous requirements on waste form, and must be protected against inadvertent intrusion. Waste facilities are limited on the waste they can accept based on a facility's radioactive materials license and their Waste Acceptance Criteria. For example, the EnergySolutions waste facility in Utah, which is licensed by the Utah Department of Environmental Quality Division of Waste Management and Radiation Control, can only accept Class A waste. The Waste Control Specialists, LLC (WCS) Federal Waste Facility in Texas was designed, permitted, and constructed for disposal of Class A, B, and C LLRW and LLMW. The WCS Federal Waste Facility is licensed by the Texas Commission on Environmental Quality.

Under Alternative 3 (Preferred Alternative), dismantlement would be managed under a Navy contract process. Under this alternative, the contractor would prepare reactor plant dismantlement and disposal planning documents to conform with NRC standards for waste disposal and shipping. The Navy envisions contractually invoking NRC standards and obtaining NRC oversight via an interagency support agreement. The Navy would retain regulatory authority and contractually support use of the NRC requirements. The NRC would review project planning and engineering documents, conduct oversight of project execution, and provide the Navy recommendations for Navy enforcement with the dismantlement contractor.

3.2.1.2.1.4 U.S. Department of Transportation

The U.S. Department of Transportation (DOT) regulates the transportation of hazardous materials, including radioactive materials in 49 CFR, subpart B, chapter 1, subchapter C, *Hazardous Material Regulations* (49 CFR Parts 171 through 180). Subpart I, *Class 7 (Radioactive) Materials*, of subchapter C (49 CFR Parts 173.401-173.477) specifically addresses the transportation of radioactive materials. DOT regulations cover all aspects of radioactive materials transportation, including packaging, shipper and carrier responsibilities, documentation, and all levels of radioactive material from exempt quantities to very high levels. Hazardous materials are defined in 49 CFR Part 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR Part 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR Part 173. The transportation of radioactive and hazardous materials and waste is analyzed in Section 3.1 (Public and Occupational Health and Safety).

3.2.1.2.1.5 Resource Conservation and Recovery Act of 1976 (Public Law 94-5800), as Amended by the Hazardous and Solid Waste Amendments

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) of 1976 in 42 United States Code Section 6903(5), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid waste, which because of its quality, concentration, or physical, chemical, or infectious characteristics may (a) cause, or significantly contribute to an increase in mortality or increase in serious irreversible, or incapacitating reversible, illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." The regulations governing hazardous waste identification, classification, generation, management, and disposal are found in 40 CFR Parts 260 through 273.

Washington, Virginia, Texas, and Alabama have been granted authority to implement the RCRA including additional parts of the RCRA program that the Environmental Protection Agency (EPA) promulgated, such as corrective action and land disposal restrictions. State RCRA program requirements must be at least as stringent as federal requirements.

3.2.1.2.1.6 Toxic Substances Control Act of 1976 (Public Law 49-469; 40 Code of Federal Regulations, Subchapter R)

The Toxic Substances Control Act (TSCA) authorizes the EPA to obtain data from industry on health and environmental effects of chemical substances and mixtures. If unreasonable risk or injury may occur, EPA may regulate, limit, or prohibit manufacture, processing, chemical distribution, use, and disposal of such chemicals and mixtures. Under Subpart R, Part 761 regulates the in-commerce use, disposal, storage, and making of polychlorinated biphenyl (PCB) and PCB items. The ex-Enterprise reactor compartment packages would be considered PCB bulk product waste for the presence of non-leachable PCBs within solid materials such as rubber, paint, and plastics under this regulation. Under Subpart R, Part 763 regulates asbestos waste. Ex-Enterprise reactor compartment packages contain asbestos in insulation materials.

3.2.1.2.1.7 Environmental Protection Agency Solid Waste Regulations (40 Code of Federal Regulations Parts 240-280)

40 CFR Parts 239 through 259 contain the regulations for solid waste including, but not limited to, guidelines for thermal processing of solid wastes, solid waste used as fuel, storage and collection of commercial solid waste, and source separation for materials recovery.

3.2.1.2.2 State Regulations

3.2.1.2.2.1 Washington

Washington regulations would apply to the reactor compartment packaging alternatives during the dismantlement of the propulsion space section and preparation of the reactor compartment packages that would be disposed of at the DOE Hanford Site.

Washington Department of Ecology Hazardous Waste Management Regulations: Washington Administrative Code (WAC) Chapter 173–303

These regulations set standards for the safe management of dangerous wastes and designate those solid wastes that are dangerous or extremely hazardous to the public health and environment. Under WAC Chapter 173–303, lead remaining in place in the reactor compartment package as radiation shielding is regulated as a state-only dangerous waste. This shielding lead is not regulated as a

hazardous waste under RCRA because the lead is used for shielding in LLRW disposal operations and would be fulfilling its intended use. Lead removed from ex-Enterprise but not used for shielding in disposal packages is regulated under RCRA. Other materials removed during ex-Enterprise dismantlement could also be regulated under WAC Chapter 173-303 for RCRA metals such as chromium.

Washington Regulations for the Transportation of Hazardous Materials: Revised Code of Washington Chapter 46.48

The Revised Code of Washington Section 46.48.170, *State patrol authority—Rules and regulations*, states the Washington state patrol has the authority to adopt and enforce the regulations promulgated by the DOT in 49 CFR Parts 100 through 199, *Transportation of Hazardous Materials*. These regulations apply to motor carriers offering, accepting, storing, or transporting hazardous materials and to persons that inspect, certify, test, or repair cargo tank motor vehicles.

Washington Wastes Containing PCBs Regulations: WAC Chapter 173–303

Wastes that are not regulated by the EPA under 40 CFR Part 761.60 (TSCA) may be regulated under the WAC Chapter 173–303, Dangerous Waste Regulations, depending on the waste content and form. In general, the kinds of practices that are subject to WAC Chapter 173–303 include discarding insulating or cooling fluids and rinsate, including discharging these substances to air, land, or water, and burning these substances; salvaging, scrapping, or rebuilding transformers, capacitors, or bushings; or disposal of soils, rags, absorbents, or other materials contaminated with PCB during the salvaging or rebuilding of transformers, capacitors, or bushings (Washington State Department of Ecology, 2010). PCBs in the reactor compartment packages are in a solid, non-leachable form such as in rubber, plastic and paint, and are considered PCB bulk product waste under 40 CFR Part 761 and would not be regulated under WAC Chapter 173–303.

3.2.1.2.2.2 Virginia

Applicable Virginia Department of Environmental Quality (VDEQ) regulations for the management and disposal of hazardous materials and wastes are listed below.

VDEQ Hazardous Waste Management Regulations: 9 Virginia Administrative Code (VAC) 20-60

Hazardous waste in Virginia is regulated under RCRA Subtitle C. Businesses and other facilities in Virginia are also required to comply with hazardous waste regulations prescribed in 9 VAC 20-60, which closely follow the federal standards established under RCRA. Facilities that store, treat, and dispose of hazardous wastes require a permit from VDEQ.

VDEQ Regulations for the Transportation of Hazardous Materials: 9 VAC 20-110

The purpose of the Virginia hazardous material transportation regulations is to regulate the transportation of hazardous materials, to maintain a register of shippers, and monitor the transportation of hazardous radioactive materials requiring advance notification in Virginia. Notwithstanding the limitations contained in 49 CFR Part 171.1(a)(3), the Virginia hazardous material transportation regulations apply to any person who transports hazardous materials or hazardous radioactive materials or offers such materials for shipment.

VDEQ Asbestos-Containing Waste Materials Regulations: 9 VAC 20-81-620

The asbestos-containing waste materials (ACM) regulations in 9 VAC 20-81-620 regulate the management of all ACM generated by asbestos mills, by manufacturing, fabricating, and spraying operations, and regulated ACM as defined by 40 CFR Part 61, Subpart M, as amended. It is generated in

the course of demolition and renovation of installations, structures or buildings, or other waste-generating activities. In order for ACM to be accepted at the disposal site, materials must meet the transporting and packaging requirements for ACM waste according to 40 CFR Part 61, Subpart M.

VDEQ Wastes Containing PCBs Regulations: 9 VAC 20-81-630

Solid wastes containing PCB concentrations between 1 part per million (ppm) and 50 ppm are restricted to disposal in sanitary landfills or industrial waste landfills with leachate collection, liners, and appropriate groundwater monitoring under this regulation. Additionally, PCB bulk product wastes with concentrations above 50 ppm may be approved for disposal on a case-by-case basis. Submissions prepared for the director of VDEQ are reviewed and their decision would include a description of the PCB waste indicating the material proposed for disposal and how the federal regulations under 40 CFR Part 761.62 apply to the material.

3.2.1.2.2.3 Texas

Applicable Texas Commission on Environmental Quality (TCEQ) regulations for the management and disposal of hazardous materials and wastes are listed below.

TCEQ Industrial Solid and Municipal Hazardous Waste Regulations: 30 Texas Administrative Code (TAC) 335

The purpose of 30 TAC 335 and specifically Subchapter B, Hazardous Waste Management General Provisions, is to implement a state hazardous waste program which controls hazardous waste defined by 40 CFR Part 261 from point of generation to ultimate disposal. Additionally, 30 TAC 335 Subchapter C, Standards Applicable to Generators of Hazardous Waste, establishes standards for generators of hazardous waste.

TCEQ Regulations for the Transportation of Hazardous Materials: 30 TAC 335, Subchapter D

This subchapter establishes standards for transporters transporting hazardous waste to off-site storage, processing, or disposal facilities.

TCEQ Asbestos-Containing Waste Materials Regulations: 30 TAC 330.171 and .172

Regulated ACM may be disposed of at a Type I or Type I arid exempt municipal solid waste (MSW) landfill in Texas in accordance with 30 TAC 330.171(c)(3). Non-regulated ACM is material containing less than 1 percent asbestos or non-friable ACM not identified as regulated. Non-regulated ACM may be disposed of at any Texas MSW landfill provided the facility is authorized to accept the waste in accordance with 30 TAC 330.171(c)(4).

TCEQ Regulations for Wastes Containing PCBs: 30 TAC 330.15 and 30 TAC 335.508

In Texas, PCB wastes, as defined under 40 CFR Part 761, are prohibited from disposal in any MSW facility by 30 TAC 330.15(e) unless authorized by the EPA and the MSW facility permit. Media contaminated by a material containing greater than or equal to 50 ppm total PCBs and wastes containing greater than or equal to 50 ppm PCBs shall be classified as a Class 1 waste.

3.2.1.2.2.4 Alabama

Applicable Alabama Department of Environmental Management (ADEM) regulations for the management and disposal of hazardous materials and wastes are listed below.

ADEM Hazardous Waste Management Regulations: Administrative Code 335-14-3

Administrative Code 335-14-3 establishes standards for generators of hazardous waste as defined in 335-14-1-.02 and generators of other waste destined for disposal at commercial hazardous waste disposal facilities located in Alabama.

ADEM Regulations for the Transportation of Hazardous Materials: Administrative Code 335-14-4

Administrative Code 335-14-4 establishes standards which apply to persons transporting hazardous waste in Alabama if the transportation requires a manifest under Chapter 335-14-3. A transporter must not transport hazardous wastes without having received an EPA identification number from the EPA or the authorized state in which the base of operations is located.

ADEM Asbestos-Containing Waste Materials Regulations: Administrative Code 335-13-4-.26(2)

Any person who generates, processes, treats, or disposes of friable asbestos shall comply with Administrative Code 335-13-4-.26(2). Friable asbestos must be disposed of in a facility permitted by ADEM. The friable asbestos must arrive at the disposal location in properly labeled, leak-tight containers as determined by the ADEM Air Division.

ADEM Wastes Containing PCBs Regulations

Alabama follows federal regulations for handling, marking, treating, storing, and disposing of PCBs and PCB items under 40 CFR Part 761. In addition, Alabama requires preapproval of PCB wastes regulated under the TSCA that are to be disposed of at commercial hazardous waste facilities in the state.

3.2.1.2.3 Radioactive Waste

Dismantlement of ex-Enterprise would generate LLRW in various forms, including the reactor vessels contained in reactor compartment packages under the reactor compartment packaging alternatives, high-activity materials from dismantled reactor vessels under Alternative 3 (Preferred Alternative), low-activity wastes such as piping and reactor system components, and very low-activity materials such as used personal protective equipment. LLRW not disposed of at either the DOE Hanford Site or the DOE SRS would be disposed of according to NRC regulations in 10 CFR Part 61.55, Waste Classification. This regulation defines waste as Class A, Class B, Class C, or Greater Than Class C. Class A waste has the fewest disposal restrictions. Class B waste must meet more rigorous requirements to ensure waste stability after disposal. Class C waste must also meet the rigorous requirements of Class B waste to ensure waste stability after disposal, and the disposal facility must meet additional requirements to protect against inadvertent intrusion. The waste class is based on the activity concentration limits of certain radionuclides. For waste containing mixtures of radionuclides, the total concentration and waste classification is determined by the sum of fractions rule described in 10 CFR Part 61.55(a)(7).

Under the reactor compartment packaging alternatives, the reactor compartment packages would be disposed of at the DOE Hanford Site. LLRW generated that was not associated with volume encompassed by the reactor compartment package would be disposed of consistent with applicable DOE, NRC, or NRC agreement state waste disposal regulations, as currently performed for the established reactor compartment disposal program. Work from ex-Enterprise propulsion space section dismantling and recycling efforts would be within the scope of typical work performed at PSNS & IMF.

The DOE sites have radioactive waste disposal limits based on site-specific conditions. Appendix D of the 1996 *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants* (hereinafter referred to as the 1996 EIS) (Navy & DOE, 1996) discusses application of the NRC classification system and DOE classification system to the internal structure of the reactor vessels of the ship classes being disposed of, noting that the structures would be NRC Class C or DOE Hanford Category 3. NRC Class C and DOE Hanford Category 3 limits are intended to be functionally equivalent in defining a waste suitable for land disposal.

Under Alternative 3 (Preferred Alternative), it is anticipated that LLRW would be disposed at WCS in Texas (accepts Classes A, B, and C waste), EnergySolutions in Utah (accepts only Class A waste), or to the DOE SRS in South Carolina.

For Alternative 3 (Preferred Alternative), it is envisioned that ex-Enterprise reactor vessels (along with their internal structures) would be disposed of as a Class C waste under the NRC regulations (or DOE Category 3 for disposal at the DOE SRS). Disposal options for the reactor vessels based on waste class would then include WCS in Texas and the DOE SRS in South Carolina.

Other large reactor plant components would be Class A waste. The disposal option of these wastes includes WCS in Texas, EnergySolutions in Utah, and the DOE SRS in South Carolina. Approximately 352 container express (CONEX) boxes of reactor plant components would also be Class A waste. Other miscellaneous radioactive waste shipments would be expected to be Class A waste. The disposal option of these wastes includes WCS, EnergySolutions, and the DOE SRS.

All waste is envisioned to be disposed in accordance with NRC, state, or DOE regulations at licensed or permitted disposal facilities. Compliance with the regulations and license/permit requirements ensure impacts on public and occupational health and safety would be minimal.

3.2.1.3 Best Management Practices

The Navy has developed and implemented a program of total ship recycling to safely dispose of decommissioned nuclear-powered ships. The program for total ship recycling was developed directly from experience gained in dismantling submarine missile compartments. The development of procedures for demilitarization and handling of hazardous materials also evolved from this experience. Following a review of options for disposal of the remainder of the ships, the Navy instituted a total ship recycling program in 1991.

Under the reactor compartment packaging alternatives, all work involving hazardous and radioactive materials at PSNS & IMF would be carried out by trained personnel using appropriate personal protective equipment in accordance with NNPP requirements. Hazardous materials would be properly disposed of in accordance with the current PSNS & IMF waste management procedures (WMPs). The WMPs direct proper disposal of hazardous materials in compliance with applicable federal, state, and local regulations.

For work conducted by a commercial company under Alternative 3 (Preferred Alternative), the Navy would use NRC regulatory requirements for radiological controls, consistent with the requirements normally invoked on the commercial radiological dismantlement industry for this type of work. The Navy envisions implementing the NRC decommissioning process for radioactive material licensees described in the NRC Consolidated Decommissioning Guidance (Nuclear Regulatory Guide-1757) with support from the NRC. The Navy would retain regulatory authority and enforce NRC requirements via contract with the dismantlement contractor.

For each of the alternatives, radioactive waste packaging and shipping would meet applicable NRC, DOE, and DOT regulatory requirements. 10 CFR Part 20 contains the radiation protection standards issued by the NRC. The provisions of 10 CFR Part 20 control the receipt, possession, use, transfer, and disposal of licensed material by any licensee in such a manner that the total dose to an individual does not exceed the standards for protection against radiation prescribed in the regulations in this part. Under this regulation, radiological work is to be accomplished in a manner that keeps radiation exposure to workers and the public as low as reasonably achievable.

According to the NRC, about 3 million packages of radioactive materials are shipped each year in the United States, either by highway, rail, or water (NRC, 2017). Regulating the safety of radioactive material shipments is the joint responsibility of the NRC and DOT. The NRC establishes requirements for the design and manufacture of packages for radioactive materials under 10 CFR Part 71, *Packaging and Transportation of Radioactive Material*, and 10 CFR Part 73, *Physical Protection of Plants and Materials*. The DOT regulates the shipments while they are in transit under 49 CFR Parts 171 through 180, which govern the packaging and shipping of radioactive materials. DOE also has shared regulatory authority over transportation of radioactive materials on the DOE sites.

3.2.1.4 Approach to Analysis

This EIS/OEIS evaluates the potential environmental impacts from radioactive and non-radioactive hazardous materials and wastes resulting from the proposed dismantlement and disposal of ex-Enterprise under three alternatives for the Proposed Action and a No Action Alternative. The following sections evaluate the radioactive and non-radioactive hazardous materials and wastes contained in ex-Enterprise, the available disposal options for each dismantlement location, and the environmental effects associated with transport of radioactive and non-radioactive hazardous materials and wastes.

The potential environmental consequences related to occupational and public exposure to radioactive materials and exposure to toxic and hazardous materials such as ACM, PCBs, lead, and chromates are discussed in Section 3.1 (Public and Occupational Health and Safety) and Section 3.2.2.1 (Navy and Commercial Shipyards). The measures that would be employed to protect site workers are also protective of the public and the environment.

3.2.2 Affected Environment

This section provides an overview of the facilities and WMPs, including administrative controls, at Navy and commercial shipyards. This section also describes the treatment or disposal facilities that would receive waste from the Proposed Action and alternatives.

3.2.2.1 Navy and Commercial Shipyards

Navy and commercial shipyards routinely manage hazardous materials from ship repair, decommissioning, and ship recycling work. ACM, elemental lead, lead-based paint (LBP), PCBs, and other non-radioactive hazardous materials are onboard nearly all ships that are constructed, maintained, or dismantled at Navy or commercial shipyards. These shipyards have existing state or federal permits and regulator-approved procedures for managing hazardous materials and hazardous waste. However, several commercial shipyards that are envisioned to perform ex-Enterprise dismantlement do not currently perform radiological work. The following describes the typical dismantlement process at Navy and commercial shipyards.

When removed from the ship, materials and equipment would typically be transferred to an on-site scrap yard located on or near the Navy or commercial shipyard facility. This material and equipment, which may be cut into smaller pieces or stripped of valuable materials, may contain or be contaminated with hazardous materials, including ACM, PCBs, LBP, oils, and fuels. Scrap metals, including steel, aluminum, copper, copper-nickel alloy, and lesser amounts of other metals, may be sorted by grade and composition and sold to re-melting firms or to scrap metal brokers. Other materials that are not recycled, including hazardous materials and other wastes, would be disposed of according to applicable local, state, and federal laws and regulations.

For all dismantlement alternatives at Navy or commercial shipyard facilities, personnel would sort and segregate waste. The useful materials would be recycled; the non-hazardous wastes would be properly disposed of; and the remaining LLRW, LLMW, and hazardous wastes would be sent to authorized treatment or disposal facilities.

Abatement of hazardous materials inside and outside the ex-Enterprise reactor plant spaces must be accomplished prior to dismantlement. Specific materials requiring abatement include asbestos lagging, chromated water, soundproofing material contaminated with PCBs, and LBP and other coatings that are present along cut lines for torches and grinders. The reactor compartments contain lead shielding, which would not be removed prior to disposal of the reactor compartment packages under the reactor compartment packaging alternatives but could be removed under Alternative 3 (Preferred Alternative).

Table 3.2-1 provides volume estimates for hazardous wastes from dismantlement of ex-Enterprise. Based on estimates scaled off of waste volumes generated during the dismantlement of the ex-Forrestal conventionally powered aircraft carrier, the Navy estimates that a total of 8,813 tons of hazardous materials would be removed from ex-Enterprise during dismantlement. The Navy also estimates that 3,291 tons of this volume would come from the propulsion space section. The components of this waste would include primarily asbestos and PCB wastes.

Table 3.2-1: Hazardous Waste Estimates

Hazardous Waste	Ex-Forrestal	Alternatives 1 and 2		Alternative 3 (Preferred Alternative)
		Ex-Enterprise (CVN 65) (commercial site)	Propulsion Space Section (PSNS & IMF)	Ex-Enterprise (CVN 65) (commercial site)
Displacement (long tons)[1]	57,402	75,000 (initial)	28,000	75,000
PCB Wastes[2] (tons)[3]	6,742	5,520	3,289	8,809
Asbestos Only (tons)	2	1	1	2
Other Hazardous Waste (tons)[4]	2	1	1	2
Total Hazardous Waste (tons)	**6,746**	**5,522**	**3,291**	**8,813**
Non-hazardous Scrap[5] (tons)	57,545	47,117	28,070	75,187

[1]1 long ton = 2,240 pounds
[2]Includes liquids, bulk product waste (including contaminated asbestos), and paints that may also contain toxic metals (e.g., lead)
[3]1 ton = 2,000 pounds
[4]The table does not include lead shielding or lead structure (e.g., elemental solid lead waste). Lead waste is accounted for within the radioactive waste volumes discussed in Section 3.1 (Public and Occupational Health and Safety) and Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants).
[5]Steel and non-ferrous scrap
Notes: PCB = Polychlorinated biphenyl, PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility

The following sections describe hazardous materials commonly found during dismantling operations at Navy and commercial shipyards.

3.2.2.1.1 Asbestos

Repair and ship hull recycle operations routinely encounter and handle ACM. ACM is found throughout Navy ships in insulating materials on piping systems, in electrical cables, and on ship structures.

Asbestos exposure can lead to asbestos-related diseases including asbestosis, pleural plaques, lung cancer, and mesothelioma. As discussed in the 2012 *Final Environmental Assessment on the Disposal of Decommissioned Defueled Naval Reactor Plants from USS ENTERPRISE (CVN 65)*, asbestos is regulated in the workplace, in removal operations, and in the environment (Navy & DOE, 2012). Federal environmental regulations for asbestos work are provided in 40 CFR Part 61. Sealed containments, sealed worker suits (with air-fed hoods), and water damping/wiping are examples of methods employed to contain asbestos and protect workers and the environment. Under the reactor compartment packaging alternatives, an estimated 1 ton of ACM would be generated at the commercial dismantlement facility and 1 ton of ACM would be transferred to PSNS & IMF in the propulsion space section (see Table 3.2-1). Therefore, 1 ton of ACM waste would be generated at PSNS & IMF. The Navy estimates that a total of up to 2 tons of ACM waste would be generated at the commercial dismantlement facility from dismantlement of ex-Enterprise under Alternative 3 (Preferred Alternative) (see Table 3.2-1). Asbestos-only waste is a small amount due to extensive PCB and/or toxic metal contaminates being included in the makeup of most insulating materials.

3.2.2.1.2 Polychlorinated Biphenyls

PCBs are commonly found shipboard in wool felt sound damping, electrical cable rubber, and paint. Wool felt sound damping and electrical equipment containing liquid PCBs are removed and disposed of under 40 CFR Part 761. Ex-Enterprise is not expected to contain the wool felt sound damping. Wool felt sound damping is regulated under the WAC 173-303 for RCRA metals such as chromium. The remaining PCBs are in a solid, non-leachable form such as in rubber, plastic, and paint, and are considered PCB bulk product waste under 40 CFR Part 761. PCB bulk product waste may be disposed of in MSW landfills (Navy & DOE, 2012). The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as chloracne and rashes.

The Navy estimates that a total of up to 8,809 tons of PCB waste (liquid, bulk product waste, and paints) would be generated at the commercial dismantlement facility under Alternative 3 (Preferred Alternative) (see Table 3.2-1). Under the reactor compartment packaging alternatives, an estimated 5,520 tons of PCB waste would be generated at the commercial dismantlement facility and 3,289 tons of PCB waste would be transferred to PSNS & IMF in the propulsion space section (see Table 3.2-1). Therefore, 3,289 tons of PCB waste would be generated at PSNS & IMF. The reactor compartment packages would be considered PCB bulk product waste under federal law (40 CFR Part 761) for the presence of non-leachable PCBs within solid materials such as rubber, paint, and plastics.

3.2.2.1.3 Lead

Lead is found in the form of lead ballasts, canned (inside a metal jacket) radiation shielding in Navy reactor compartment packages, and in LBP. Dismantlement and reactor compartment packaging work under Alternatives 1, 2, and 3 would involve lead removal and potential lead exposures. The most extensively studied health outcomes of lead exposures are neurological, renal, cardiovascular, hematological, immunological, reproductive, and developmental effects. Under the reactor compartment packaging alternatives, permanently installed shielding lead would remain in the reactor compartment packages while ballast lead would be removed from the reactor compartment packages per agreement with the state of Washington. The lead in the reactor compartment packages is regulated as a state-only dangerous waste under Washington state law but is not regulated as a hazardous waste under RCRA because lead used for shielding in LLRW disposal operations is not considered a waste by the EPA. The disposal site for reactor compartment packages, Trench 94 at the DOE Hanford Site, operates under the interim status standards of WAC 173-303-400 (Navy & DOE, 2012). Under the reactor compartment packaging alternatives, lead and LBP waste removed at the commercial dismantlement facility would be managed under state and federal handling, storage, and recycle/disposal guidelines and regulations. Under Alternative 3 (Preferred Alternative), all lead, including radiation shielding from the propulsion space section, and LBP waste would also be managed under state and federal handling, storage, and recycle/disposal guidelines and regulations. Lead that is also LLRW must be decontaminated prior to recycling or treated (i.e., encapsulated) to meet land disposal requirements of the LLRW facility.

3.2.2.1.4 Radioactive Potassium Chromate

Under Alternatives 1, 2, and 3, radioactive potassium chromate solution would be removed from Navy reactor compartments, filtered to reduce radioactivity, and would possibly be reused in other Navy nuclear-powered ships. If the potassium chromate is not filtered and recycled, it must be managed as a LLMW. LLMW must be treated and disposed of in accordance with applicable federal and state regulations. Chromate salts, such as potassium chromate, are corrosive and produce cellular damage to

tissue. Ingestion may produce inflammation of the digestive tract, nausea, vomiting and abdominal pain. Chromates cause kidney damage and blood cell damage.

Waste processing of ex-Enterprise radioactive potassium chromate solution removed from the reactor compartments would occur at PSNS & IMF under the reactor compartment packaging alternatives and at the commercial dismantlement facility or an off-site waste treatment facility under Alternative 3 (Preferred Alternative). Processing is expected to involve evaporation to reduce volume, reduction of hexavalent chromium to trivalent chromium, and solidification of the residual liquid as LLRW. Regardless of the specific process ultimately used, it would be expected to result in an end product for disposal that meets Land Disposal Restrictions in accordance with RCRA regulations. The waste would be characterized and designated consistent with state and federal regulations (Navy & DOE, 2012).

3.2.2.1.5 Mixed Waste

Under Alternatives 1, 2, and 3, LLMW would require treatment in accordance with appropriate treatment standards before disposal. Similarly, radioactive PCB waste would require storage until sufficient treatment or disposal capacity became available. LLMW generated under Alternatives 1, 2, and 3 could include solid materials (e.g., a piece of lead), a solid with a hazardous material tightly bound within its matrix as part of the formulation (e.g., PCB in paint chips, rubber gaskets, or insulation), sound damping felt (containing PCBs), or solidified liquid (e.g., processed potassium chromate solution). These wastes would be appropriately managed by permitted hazardous waste treatment and disposal facilities, and, as such, would not result in unauthorized exposures to workers or unpermitted releases to the environment (Navy & DOE, 1996).

3.2.2.2 Waste Facilities

Non-radioactive hazardous materials as described in Section 3.2.2.1 (Navy and Commercial Shipyards) would be part of waste streams generated under all three action alternatives, and at all dismantlement locations. Under the reactor compartment packaging alternatives, hazardous wastes located outside the propulsion space section would be disposed of regionally at authorized hazardous waste disposal facilities. Hazardous and radioactive materials in the propulsion space section would be disposed of according to PSNS & IMF WMPs. For Alternative 3 (Preferred Alternative), the entire ship and all of its radioactive and hazardous waste would require disposal locations that accept waste generated from the commercial dismantlement facility.

3.2.2.2.1 Washington

Under the reactor compartment packaging alternatives, ex-Enterprise would be partially dismantled at a location outside the state of Washington (in one of the three states discussed in the following sections) and the propulsion space section would be dismantled at PSNS & IMF. PSNS & IMF routinely manages hazardous and radioactive materials from ship repair, reactor compartment packaging, and ship recycle work. LLRW, LLMW, and hazardous wastes generated during dismantlement of the propulsion space section and preparation of the reactor compartment packages would be disposed of according to PSNS & IMF WMPs. The reactor compartment packages would be disposed of in Trench 94 at the DOE Hanford Site in Richland, Washington.

Under the reactor compartment packaging alternatives, four large tanks external to the reactor compartments could be removed at PSNS & IMF and shipped whole to US Ecology Washington, an LLRW disposal facility located near Richland, Washington, using a similar water-to-land transportation route as the reactor compartment package. Whole tank dimensions are too large for normal rail and truck

shipment and would be shipped by barge via the Port of Benton barge slip. If barged, the shipment would be completed in the manner similar to reactor compartments (Navy & DOE, 2012). Under Alternative 3 (Preferred Alternative), these tanks would be managed like other LLRW and would be cut up in segments to fit into standard road or rail shipping containers. See Section 2.3 (Alternatives Carried Forward for Analysis) for complete descriptions of waste transport and disposal under the reactor compartment packaging alternatives.

3.2.2.2.2 Virginia

Hampton Roads Metropolitan Area, Virginia, could host the commercial dismantlement facility under the reactor compartment packaging alternatives or the complete dismantlement of ex-Enterprise under Alternative 3 (Preferred Alternative). In all cases, materials would be removed, packaged, stored, and transported in accordance with local, state, and federal standards and regulations.

Rules for solid waste containing PCBs with concentrations of 50 ppm or more in Virginia are the same as the federal regulations under 40 CFR Part 761. These rules include waste screening to detect and prevent the disposal of PCBs and other hazardous wastes at MSW landfills under 40 CFR Part 258.20. Under 9 VAC 20-81-630, solid wastes containing PCB concentrations between 1 ppm and 50 ppm are restricted to disposal in sanitary landfills with leachate collection, liners, and appropriate groundwater monitoring. PCB bulk product wastes with concentrations above 50 ppm may be approved for disposal by VDEQ on a case-by-case basis. No chemical waste facilities or waste incinerators in Virginia routinely accept PCB wastes above 50 ppm.

For any ACM to be accepted at a disposal site in Virginia, transportation and packaging requirements (e.g., waste properly bagged and sealed) must be met. All ACM generated in a manufacturing, fabricating, or spraying operation, and all regulated ACM generated in a demolition or renovation operation must be disposed of in a special purpose landfill or in a designated area of a sanitary landfill. Category I and Category II non-friable ACM may be disposed of in a landfill applying daily soil cover, providing that the operator is notified, and the landfill permit specifically authorizes acceptance of the waste (Virginia Department of Environmental Quality, 2020).

There are no in-state hazardous waste disposal options in Virginia or neighboring states (EPA, 2017b, 2017d, 2017e). There are, however, hazardous waste treatment and storage facilities in Virginia (EPA, 2017d). Disposal options for LLRW generated from complete dismantlement of ex-Enterprise in Virginia include the DOE SRS in South Carolina, EnergySolutions in Clive, Utah (accepts only Class A waste), and WCS located west of Andrews, Texas (accepts Classes A, B, and C waste).

3.2.2.2.3 Texas

Brownsville, Texas could also host the partial dismantlement of ex-Enterprise under the reactor compartment packaging alternatives or the complete commercial dismantlement under Alternative 3 (Preferred Alternative). The contract for commercial dismantlement would require a plan for hazardous waste disposal according to applicable local, state, and federal regulations.

The Navy has verified there are sites available in Texas that can manage the anticipated amount of hazardous waste from dismantlement of ex-Enterprise. US Ecology Texas, a hazardous waste treatment and disposal facility located in Robstown, Texas, is located less than 200 mi. from Brownsville, Texas, and is equipped to handle mixed media/debris/devices, inorganic/organic liquids, organic solids, and bulk PCB remediation waste. In 2017, US Ecology Texas disposed of approximately 42,000 tons of waste

(EPA, 2017c). WCS, located west of Andrews, Texas, also accepts some forms of hazardous wastes, including PCB wastes. Two additional facilities in Texas accept PCB waste for disposal.

Texas follows federal regulations for handling, marking, treating, storing, and disposing of PCB wastes under 40 CFR Part 761 and regulated disposal of ACM in 30 TAC 330. Regulated (friable) ACM may be disposed of at a Type I or Type I arid exempt MSW landfill in accordance with 30 TAC 330.171(c)(3). Non-regulated (non-friable) ACM may be disposed of at any MSW landfill, provided the facility is authorized to accept the waste in accordance with 30 TAC 330.171(c)(4).

Disposal options for LLRW generated from complete dismantlement of ex-Enterprise in Texas include the DOE SRS in South Carolina, EnergySolutions in Clive, Utah (accepts only Class A waste), and WCS located west of Andrews, Texas (accepts Classes A, B, and C waste).

3.2.2.2.4 Alabama

Mobile, Alabama, could also host the partial dismantlement of ex-Enterprise under the reactor compartment packaging alternatives or the complete commercial dismantlement under Alternative 3 (Preferred Alternative). The contract for commercial dismantlement would require a plan for hazardous waste disposal according to applicable local, state, and federal regulations.

The Navy has verified there is at least one site available in Alabama that can manage the anticipated amount of hazardous waste from dismantlement of ex-Enterprise. This site is Chemical Waste Management, which operates a hazardous waste facility located in Emelle, Alabama, approximately 180 mi. from Mobile. This facility is equipped to handle mixed media/debris/devices, inorganic/organic liquids, and organic solids. In 2017, Chemical Waste Management disposed of more than 103,000 tons of hazardous waste (EPA, 2017a).

Alabama follows federal regulations for handling, marking, treating, storing, and disposing of PCB wastes under 40 CFR Part 761. Chemical Waste Management in Emelle, Alabama, is the only waste facility in Alabama that accepts PCB waste (EPA, 2019).

ACM may be disposed of in any permitted landfill in Alabama with written approval from ADEM, following the special waste provisions found in ADEM regulations at ADEM Administrative Code 335-13-4-.26(2) (Alabama Department of Environmental Management, 2008).

There are no in-state LLRW disposal options in Alabama or neighboring states. Disposal options for LLRW generated from complete dismantlement of ex-Enterprise in Alabama include DOE SRS, EnergySolutions in Clive, Utah (accepts only Class A waste), and WCS located west of Andrews, Texas (accepts Classes A, B, and C waste).

3.2.3 Environmental Consequences

Hazardous materials and hazardous waste associated with the dismantlement of nuclear-powered and conventional naval ships are well documented. Sections 2.3.2 (Alternative 1 – Single Reactor Compartment Packages) and 2.3.3 (Alternative 2 – Dual Reactor Compartment Packages) describe the established Navy process of dismantling nuclear ships and potential modifications considered in the reactor compartment packaging alternatives, respectively (Navy, 2012a; Navy & DOE, 2012). During the preparation of these reactor compartment packages, remnant hull sections of the ship not containing the reactor plant would be removed and recycled under the existing PSNS & IMF program, as described in *U.S. Naval Nuclear-Powered Ship Inactivation, Disposal, and Recycling* (Navy, 2019b). The existing program deconstructs submarines to facilitate reactor compartment disposal as described in the

1996 EIS. Under Alternative 1, the eight remaining reactor compartment packages would be similar in size and weight to those evaluated under the 1996 EIS. This process would not require substantial changes to the infrastructure at PSNS & IMF, the Port of Benton barge slip, the transport road on the DOE Hanford Site, or Trench 94 at the DOE Hanford Site.

Partial dismantlement of ex-Enterprise in Virginia, Texas, or Alabama under the reactor compartment packaging alternatives would contain the reactor plants within a propulsion space section. Nearly all of the LLRW generated from dismantlement of the propulsion space section at PSNS & IMF would be associated with the reactor compartment packages. Hazardous waste generated at the commercial dismantlement location would be managed under hazardous waste management programs and permits prepared by the ship dismantlement contractor(s) in accordance with state and federal regulations.

LLRW and hazardous waste generated during PSNS & IMF reactor compartment packaging operations would be transported and disposed of in accordance with the existing PSNS & IMF WMP. All work involving hazardous materials would be carried out by trained workers using appropriate personal protective equipment per applicable Navy Occupational Safety and Health requirements. The WMP directs proper disposal of hazardous materials in compliance with applicable federal, state, and local regulations.

LLRW generated at the commercial dismantlement location under Alternative 3 (Preferred Alternative) would be managed per the contractor-developed dismantlement plan required by the Navy contract. The dismantlement plan would follow NRC regulations and be reviewed and approved by the Navy with NRC consultation. LLRW would be transported over highways, railways, or waterways from the dismantlement location to one or more disposal sites in accordance with applicable DOT, DOE, NRC, or NRC agreement state regulations. Transportation routes are discussed further in Section 3.1 (Public and Occupational Health and Safety) of this EIS/OEIS. Hazardous waste generated at the commercial dismantlement location would be managed under hazardous waste management programs and permits prepared by the ship dismantlement contractor(s) in accordance with state and federal regulations.

The following sections discuss the potential environmental consequences associated with the management and disposal of hazardous and radioactive wastes for Alternatives 1, 2, and 3, and the No Action Alternative as described in Section 2.3 (Alternatives Carried Forward for Analysis). The potential environmental consequences related to occupational and public exposure to radioactive materials and exposure to toxic and hazardous materials such as ACM, PCBs, lead, and chromates are discussed in Section 3.1 (Public and Occupational Health and Safety) and Section 3.2.2.1 (Navy and Commercial Shipyards). The measures that would be employed to protect site workers are also protective of the public and the environment.

3.2.3.1 No Action Alternative

3.2.3.1.1 Ex-Enterprise is Stored in Newport News, Virginia

The No Action Alternative consists of the long-term waterborne protective storage of the entire ex-Enterprise for an indefinite period of time at Newport News Shipbuilding, located in Newport News, Virginia. As described in Section 2.3.1 (No Action Alternative), storage facility staff would perform periodic inspections and maintenance of the ship while in storage, to ensure that storage continues in a safe and environmentally responsible manner. All hazardous materials would be contained by the hull, and all access would be controlled to limit exposure to hazardous materials. Therefore, the No Action Alternative would result in minimal impacts on personnel or the environment.

3.2.3.2 Alternative 1: Single Reactor Compartment Packages

3.2.3.2.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

Alternative 1 includes partial non-radiological dismantlement at a commercial facility located in the Hampton Roads Metropolitan Area (with no open-water tow) or towing ex-Enterprise from Newport News Shipbuilding in Newport News, Virginia, to a location in either Alabama or Texas. The tow action of unmanned, defueled, nuclear-powered ships is governed by the methods and procedures described in the Navy Towing Manual (Navy, 2002) and Naval Sea Systems Command Instruction 4740.12 (Navy, 2012b).

Naval Sea Systems Command Instruction 4740.12 (Navy, 2012b) describes the activities that are required to tow and store defueled nuclear-powered ships. With respect to removal of hazardous materials, the following actions were taken:

- Flammable materials removed (e.g., paint, fuel, thinners)
- Lube oil systems drained and flushed
- Fuel tanks, including jet fuel tanks, drained and cleaned
- All compressed gas cylinders removed except those required for portable firefighting bottles
- All firefighting liquids removed except for portable fire extinguishers
- Batteries not needed for alarms and navigation lights removed
- All hazardous materials and asbestos removed from storerooms
- All mercury-containing equipment removed where practical
- Hydraulic systems, oil tanks, sanitary systems, etc. drained and cleaned at the time ex-Enterprise was inactivated

If necessary, prior to towing from Newport News Shipbuilding, the hull would be cleaned to remove potential invasive species. If this occurred, the process would not generate wastes regulated by the state of Virginia. Local movement of ex-Enterprise within the Hampton Roads Metropolitan Area may not require hull cleaning.

Tow ships contain fuels and oils. Responses to accidental release of these materials to the environment are covered by the EPA National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan. The National Contingency Plan is the blueprint of the federal government for responding to both oil spills and hazardous substance releases. EPA is the lead federal response agency for oil spills occurring in inland waters. The U.S. Coast Guard is the lead response agency for spills in coastal waters and deep-water ports. No other hazardous materials or hazardous wastes of significant volume would be encountered during towing actions.

Non-radioactive hazardous waste generated from preparation of ex-Enterprise for tow and hazardous waste generated onboard tow ships would be disposed of at appropriately permitted regional disposal site(s). Non-radioactive and non-hazardous materials would be transported and recycled or disposed at regional facilities in accordance with applicable local, state, and federal laws. As such, the impacts from the hazardous materials and hazardous waste from towing operations would result in minimal impacts on the environment.

In the extremely unlikely event of the sinking of ex-Enterprise in route from Newport News Shipbuilding to a commercial dismantlement facility, the defueled reactor plants containing radioactive and other

hazardous materials could potentially be breached due to water pressure. The reactor vessel, components, and piping that contain radioactivity are designed to withstand high pressures and battle shock. These would continue to provide a barrier to the release of radioactivity. Additionally, the majority of the radioactivity is locked within the corrosion resistant alloys of the internal structure and not readily available for release and, therefore, radiological environmental impacts due to sinking ex-Enterprise would be negligible.

There would be no environmental consequences from a breached reactor compartment with regard to the non-radiological constituents. This is because nearly all the non-radiological constituents (e.g., PCBs, lead, chromium, iron) are in a solid (insoluble) state. In the unlikely event the potassium chromate solution is released to the environment, its concentration would be reduced by the surrounding water to negligible amounts. ACM could be disturbed in an accident, and portions of the disturbed ACM might mix with water entering through the breach. Any ACM that eventually escaped would be expected to eventually settle out of the water and become incorporated into the sediment (Navy & DOE, 1996). As such, the impacts from the sinking of ex-Enterprise during towing would result in minimal impacts on the environment.

3.2.3.2.2 Partial Dismantlement at Commercial Dismantlement Facility (Includes In-Water Activities)

For Alternative 1, contractors would sort, segregate, and decontaminate materials to limit the generation of hazardous waste to the extent practical. The useful materials would be recycled, the non-hazardous wastes would be properly disposed of, and the remaining hazardous wastes would be sent to authorized treatment or disposal facilities.

Abatement of hazardous materials must be accomplished prior to dismantlement activities. Specific materials requiring abatement include asbestos lagging, soundproofing material contaminated with PCBs, and LBP and other coatings that are present along cut lines for torches and grinders. Control would be required in approved planning documents to prevent the spread of hazardous materials outside work areas. Therefore, no significant release of airborne or liquid contamination is anticipated during dismantlement activities, and the impact on the environment is expected to be minimal. Additionally, reasonable safeguards would be put in place when storing or staging dismantled materials on barges or upland storage sites to ensure the materials or particulate matter from the materials do not enter coastal waters.

Under Alternative 1, the partial dismantlement of ex-Enterprise at a commercial dismantlement facility would generate 5,522 tons of hazardous waste (see Table 3.2-1). Management and disposal of hazardous waste from Alternative 1 would result in minimal impacts on the environment.

3.2.3.2.3 Transport Waste and Recyclable Materials from Commercial Dismantlement Facility to an Approved Waste Disposal or Recycling Facility

The waste and recyclable materials would be transported from the commercial dismantlement facility to an approved waste disposal or recycling facility.

Hazardous waste would be transported by truck, ship, or rail from the commercial dismantlement locations to approved disposal facilities. Only properly licensed/permitted transporters would be used to transport the waste; thus, the transport of waste would have a minimal impact on the environment.

3.2.3.2.4 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

As stated in Chapter 2 (Description of Proposed Action and Alternatives), under Alternative 1, the propulsion space section would be transported via heavy-lift ship to PSNS & IMF for construction of the reactor compartment packages.

As described above under Section 3.2.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility), the impacts from an accident resulting in the sinking of ex-Enterprise and its reactor compartments during a towing operation, and release of some hazardous materials, would result in minimal impacts on the environment. The same would be the case during transport of the propulsion space section via heavy-lift ship.

The heavy-lift ship contains fuels and oils. Responses to accidental release of these materials to the environment are covered by the National Contingency Plan. The evaluation of the impacts of accidental release of these materials from the heavy-lift ship is outside the scope of this EIS/OEIS.

3.2.3.2.5 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages (No In-Water Work)

Pier-side and dry dock work at PSNS & IMF would be conducted as part of Alternative 1, as described in Chapter 2 (Description of Proposed Action and Alternatives). Hazardous and radioactive material and waste management operations from dismantlement of the propulsion space system would be consistent with ongoing and regulated practices described in PSNS & IMF WMPs and disposal of the waste would not strain the existing capacity of available disposal sites. It could take approximately five years for dry dock activities to be completed (see Table 2-2).

The results of environmental monitoring and disposal of radioactive wastes generated at PSNS & IMF are summarized in an annual report titled *Environmental Monitoring and Disposal of Radioactive Wastes from U.S. Naval Nuclear-Powered Ships and their Support Facilities* (Navy, 2019a). This report assesses the environmental effect of disposal of radioactive wastes originating from U.S. naval nuclear propulsion plants and their support facilities. The report describes disposal of radioactive liquid, transportation and disposal of solid wastes, and monitoring of the environment to determine the effect of radioactive releases. The report concludes that radioactivity associated with U.S. naval nuclear-powered ships has had no discernible effect on the quality of the environment (Navy, 2019a). The addition of ex-Enterprise disposal operations would be performed consistent with these existing Navy practices.

The subsequent preparation of the reactor compartment packages from the propulsion space section at PSNS & IMF would generate 3,291 tons of hazardous waste (see Table 3.2-1). Alternative 1 would involve dismantlement of the propulsion space section at PSNS & IMF, separation of reactor compartment pairs, and shipment of the eight single reactor compartment packages using the current Navy process. Each single reactor compartment package would be about 36 feet (ft.) L x 40 ft. W x 47 ft. H and weigh 1,651 tons.

Disposal of the reactor compartment packages in Trench 94 at the DOE Hanford Site could be accomplished within the existing capacity of the disposal site. The exact volumes of LLRW, LLMW, and other hazardous waste that would be generated at PSNS & IMF is unknown (volume estimates are provided in Table 3.2-1). Processing or disposal of LLRW, LLMW, and hazardous waste generated outside the reactor compartment packages would follow the processes outlined in the PSNS & IMF waste management procedures. Based on past Navy vessel disposal operations and the decommissioning of

commercial nuclear power plants and the STURGIS (USACE, 2014),[1] hazardous waste, LLMW, and LLRW quantities would not be anticipated to exceed the management and disposal capabilities of the involved facilities.

3.2.3.2.6 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

The construction of a concrete rail support system in Trench 94 at the DOE Hanford Site would be required in order to accommodate the reactor compartment packages under Alternative 1. A description of the rail system is provided in Section 2.3.2.6 (Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site). Construction of the concrete rail support system in Trench 94 at the DOE Hanford Site would require the management of hazardous materials such as solvents, oils, and fuels. These materials would be managed and disposed of using applicable regulations, site procedures, and best management practices to minimize exposures and releases to the environment, thus resulting in minimal impacts.

3.2.3.2.7 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

As described in Chapter 2 (Description of Proposed Action and Alternatives), under Alternative 1, transportation of the reactor compartment packages from PSNS & IMF would include water transportation to the Port of Benton barge slip and then by road to Trench 94 at the DOE Hanford Site. Under Alternative 1, reactor compartment packages would be transported from PSNS & IMF by water to the Port of Benton barge slip using the same process as the current program (Navy & DOE, 2012), as described in Section 2.3.2.7 (Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip).

As described in Section 3.2.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility), the impacts from an accident resulting in the sinking of ex-Enterprise and its reactor compartments during a towing operation, and release of some hazardous materials, would result in minimal impacts on the environment. The same would be the case during transport of the reactor compartment packages from PSNS & IMF to the Port of Benton barge slip.

The barge transport would involve tow ships that contain fuels and oils. Accidental release of these materials to the environment is covered by the National Contingency Plan. The evaluation of the impacts of accidental release of these materials from tow ships is outside the scope of this EIS/OEIS.

3.2.3.2.8 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

Under Alternative 1, the reactor compartment packages would be transported from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site using the same process used for the current program (Navy & DOE, 2012), as described in Section 2.3.2.8 (Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site). The route begins at the barge slip and enters the DOE property at Horn Rapids Road. Once on the DOE Hanford Site, the route covers about 26 miles to the disposal site (Navy & DOE, 1996). Land transportation to Trench 94 would require the use of hydraulic fluids, oils, and fuels. These materials would be managed

[1] USACE is an acronym for U.S. Army Corps of Engineers.

and disposed of using applicable regulations, site procedures, and best management practices to minimize exposures and releases to the environment, thus resulting in minimal impacts.

Under Alternative 1, single reactor compartment packages containing the internal structure and encompassing reactor vessel would be within the DOE Hanford Site Category 3 waste limits. For the DOE Hanford Site Category 3 waste disposal, each reactor vessel is contained within a reactor compartment package that has a 600- to 2,000-year expected containment life and also meets measures to protect against inadvertent intrusion. The reactor vessel itself, which approaches 6 inches in metal thickness, surrounds the internal structure and provides an additional long containment life of tens of thousands of years in the low corrosion environment in Trench 94 at the DOE Hanford Site. Additionally, the majority of the radioactivity is locked within the corrosion resistant alloys of the internal structure and not readily available for release upon access through the vessel. Therefore, as use, disposal, and transportation of single reactor compartment packages would be conducted in accordance with existing regulations and site-specific permit/license requirements, impacts from single reactor compartment package disposal would be minimal.

3.2.3.3 Alternative 2: Dual Reactor Compartment Packages

3.2.3.3.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

This aspect of Alternative 2 would be the same as Alternative 1, as described under Section 3.2.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility).

3.2.3.3.2 Partial Dismantlement at Commercial Dismantlement Facility (Includes In-Water Activities)

This aspect of Alternative 2 would be the same as Alternative 1, as described under Section 3.2.3.2.2 (Partial Dismantlement at Commercial Dismantlement Facility [Includes In-Water Activities]).

3.2.3.3.3 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

Under Alternative 2, the shipment of the propulsion space section to PSNS & IMF is identical to Alternative 1 and is described in in Section 3.2.3.2.4 (Ship ex-Enterprise via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility [Following Route Around South America]).

3.2.3.3.4 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Four Dual Reactor Compartment Packages (No In-Water Work)

Under Alternative 2, pier-side and dry dock work would be similar to Alterative 1, as described under Section 3.2.3.2.5 (Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages [No In-Water Work]).

As with Alternative 1, the subsequent preparation of the reactor compartment packages from the propulsion space section at PSNS & IMF would generate 3,291 tons of hazardous waste (see Table 3.2-1). Alternative 2 would result in four conjoined pairs of reactor compartments rather than eight single reactor compartments (Alternative 1). Thus, under Alternative 2, PSNS & IMF would transfer fewer, but heavier and larger reactor compartment packages (about 71 ft. L x 40 ft. W x 47 ft. H, and 3,304 tons) than the eight single reactor compartment packages of Alternative 1 (about 36 ft. L x 40 ft. W x 47 ft. H, and 1,651 tons).

Processing or disposal of LLRW, LLMW, and hazardous waste generated outside the reactor compartment packages under Alternative 2 would be the same as Alterative 1, as described under Section 3.2.3.2.5 (Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages [No In-Water Work]).

3.2.3.3.5 Port of Benton Barge Slip Modifications

Modification and infrastructure improvements to the Port of Benton barge slip would be needed to support the larger dual reactor compartment packages, as described in Section 2.3.3.6 (Port of Benton Barge Slip Modifications). Activities associated with construction could generate small volumes of hazardous wastes in the form of spilled fuel, hydraulic fluids, or lubricant from construction equipment. Any hazardous wastes generated as a result of these activities would be managed in accordance with applicable regulations and policies, thus resulting in minimal impacts.

3.2.3.3.6 Road Modifications Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site

Road modification between the Port of Benton barge slip and Trench 94 at the DOE Hanford Site would be needed to support the larger dual reactor compartment packages, as described in Section 2.3.3.7 (Road Improvements Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site). Activities associated with construction could generate small volumes of hazardous wastes in the form of spilled fuel, hydraulic fluids, or lubricant from construction equipment. Any hazardous wastes generated as a result of these activities would be managed in accordance with applicable regulations and policies, thus resulting in minimal impacts.

3.2.3.3.7 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

The construction of a concrete rail support system in Trench 94 at the DOE Hanford Site would be required to accommodate the larger dual reactor compartment packages under Alternative 2. A description of the rail system is provided in Section 2.3.2.6 (Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site). As detailed in Section 3.2.3.2.6 (Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site), construction of the concrete rail support system in Trench 94 would require the management of hazardous materials such as solvents, oils, and fuels. These materials would be managed and disposed of using applicable regulations, site procedures, and best management practices to minimize exposures and releases to the environment, thus resulting in minimal impacts.

3.2.3.3.8 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

Under Alternative 2, transportation of the four dual reactor compartment packages would follow the same route as the reactor compartment packages under Alternative 1, as described in Section 3.2.3.2.7 (Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip).

As described in Section 3.2.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility), the impacts from the sinking of ex-Enterprise and its reactor compartments during a towing operation, and release of some hazardous materials, would result in minimal impacts on the environment. The same would be the case during transport of the reactor compartment packages from PSNS & IMF to the Port of Benton barge slip.

The barge transport would involve tow ships that contain fuels and oils. Accidental release of these materials to the environment are covered by the National Contingency Plan. The evaluation of the impacts of accidental release of these materials from tow ships is outside the scope of this EIS/OEIS.

3.2.3.3.9 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

Under Alternative 2, the reactor compartment packages would be transported from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site using the same process used for the current program (Navy & DOE, 2012), as described in Section 2.3.2.8 (Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site). A description of the route is described in Section 3.2.3.2.8 (Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site). Land transportation to Trench 94 at the DOE Hanford Site would require the use of hydraulic fluids, oils, and fuels. These materials would be managed and disposed of using applicable regulations, site procedures, and best management practices to minimize exposures and releases to the environment, thus resulting in minimal impacts.

Under Alternative 2, dual reactor compartment packages containing the internal structures and encompassing reactors would be within the DOE Hanford Site Category 3 waste limits. For the DOE Hanford Site Category 3 waste disposal, each reactor vessel is contained within a reactor compartment package that has a 600- to 2,000-year expected containment life and also meets measures to protect against inadvertent intrusion. The reactor vessel itself, which approaches 6 inches in metal thickness, surrounds the internal structure and provides an additional long containment life of tens of thousands of years in the low corrosion environment in Trench 94 at the DOE Hanford Site. Additionally, the majority of the radioactivity is locked within the corrosion resistant alloys of the internal structure and not readily available for release upon access through the vessel. Therefore, as use, disposal, and transportation of dual reactor compartment packages would be conducted in accordance with existing regulations and site-specific permit/license requirements, impacts from dual reactor compartment package disposal would be minimal.

3.2.3.4 Alternative 3 (Preferred Alternative): Commercial Dismantlement

3.2.3.4.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

Alternative 3 (Preferred Alternative) includes complete dismantlement at a commercial facility located in the Hampton Roads Metropolitan Area (with no open-water tow) or towing ex-Enterprise from Newport News Shipbuilding in Newport News, Virginia, to a location in either Alabama or Texas. The analysis and conclusions described in Section 3.2.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility) are also applicable to Alternative 3 (Preferred Alternative), and would result in minimal impacts on the environment.

3.2.3.4.2 Complete Dismantlement of ex-Enterprise at Commercial Facility (Includes In Water Work)

Alternative 3 (Preferred Alternative) includes towing ex-Enterprise to a contracted ship dismantlement facility and complete dismantlement of the ship. Alternative 3 (Preferred Alternative) would require removing, packaging, and shipping all LLRW, LLMW, and hazardous wastes to licensed and permitted waste treatment or disposal facilities. The Navy would require the contractor(s) to prepare a complete Dismantlement Plan and Waste Management Plan that describe the processes and requirements for

safe on-site management, off-site transportation, and disposal or treatment of LLRW, LLMW, and other hazardous wastes.

For Alternative 3 (Preferred Alternative), contractors would sort, segregate, and decontaminate materials to limit the generation of hazardous waste to the extent practical. The useful materials would be recycled, the non-hazardous wastes would be properly disposed of, and the remaining radioactive and hazardous wastes would be sent to authorized treatment or disposal facilities.

Reactor plants would be disassembled into segments that can be shipped as oversized components or sized to fit into typical LLRW shipping containers. LLRW would be packaged in accordance with applicable NRC and DOT requirements.

Under Alternative 3 (Preferred Alternative), hazardous wastes would be regulated by federal and state regulations, and disposal requirements would be regional. The volume of hazardous waste generated under Alternative 3 (Preferred Alternative) is estimated at over 8,800 tons (see Table 3.2-1). The overall impacts from the management of hazardous materials, hazardous waste, and LLRW at a commercial dismantlement facility in Virginia, Texas, or Alabama are expected to be minimal, similar to those described under the reactor compartment packaging alternatives.

3.2.3.4.3 Transport Waste and Recyclable Materials from Commercial Dismantlement Facility to an Approved Waste Disposal or Recycling Facility

The Navy has determined that the eight reactor vessels with internal structure remaining would be Class C waste. Therefore, under Alternative 3 (Preferred Alternative), the reactor vessels could be disposed of at either the DOE SRS in South Carolina or at WCS in Texas. The other large reactor plant components (10 per reactor plant) would be Class A waste. The disposal options of these wastes include WCS, EnergySolutions, and the DOE SRS. Approximately 352 CONEX boxes of reactor plant components would be Class A waste. Other miscellaneous LLRW shipments would be expected to be Class A waste or potentially exempt waste materials. The disposal options of these wastes include WCS in Texas, EnergySolutions in Utah, and the DOE SRS in South Carolina.

Under Alternative 3 (Preferred Alternative), hazardous waste and non-hazardous wastes, including recyclable metal, would be managed according to applicable federal, state, and local regulations and policies. Hazardous wastes would be regulated by federal and state regulations, and disposal requirements would be regional. The total volume of hazardous waste generated under Alternative 3 (Preferred Alternative) is estimated at over 8,800 tons (see Table 3.2-1). The remaining wastes and recyclable materials from ex-Enterprise would be managed within the local region to the extent practical.

The overall impacts from the management of hazardous materials, hazardous waste, LLMW, LLRW, and other waste and recyclable materials at a commercial dismantlement facility in Virginia, Texas, or Alabama are similar to those described under the reactor compartment packaging alternatives. Therefore, waste disposal and recycling would result in minimal impacts on the environment.

LLRW would be transported by truck, ship, or rail from the commercial dismantlement locations to approved disposal facilities in accordance with applicable DOT, DOE, NRC, or NRC agreement state regulations. Only properly licensed/permitted transporters would be used to transport the waste. The transportation of waste is expected to have minimal impacts on the environment.

As discussed in Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants), dismantlement of all eight defueled reactor plants is

conservatively estimated to result in up to 440 LLRW shipments of large components and CONEX boxes (or similar-sized packages) of radioactive material being shipped by barge, rail, or truck to one or more waste facilities for disposal, as summarized below:

- reactor vessels: 8 shipments
- reactor plant components (large): up to 80 shipments
- reactor plant components (small): up to 352 CONEX boxes

Dismantlement activities would also generate a small number of additional shipments of LLRW incidental to disposal of the reactor plants, which would consist of material such as piping, tooling, and personal protective equipment. These additional wastes are similar to the small amounts of LLRW that are generated incidental to construction of reactor compartment packages and are disposed of at established waste disposal sites. The disposal options of these wastes include WCS in Texas, EnergySolutions in Utah, and the DOE SRS in South Carolina.

3.2.3.4.4 Low-Level Radioactive Waste is Disposed at Appropriate Approved Disposal Facilities

Under Alternative 3 (Preferred Alternative), available commercial LLRW disposal options are determined by the classification of the waste as provided in 10 CFR Part 61.55 (Class A, B, C, or Greater than Class C). Commercial disposal options for LLRW generated at the various Alternative 3 (Preferred Alternative) locations include EnergySolutions in Clive, Utah (accepts only Class A waste) and WCS located west of Andrews, Texas (accepts Classes A, B, and C waste). EnergySolutions and WCS have some on-site capacities for treatment of LLMW. LLMW would be treated for its regulated hazardous waste components to meet land disposal requirements.

For Alternative 3 (Preferred Alternative), the dismantlement contractor(s) would likely ship each reactor vessel with internal structure remaining inside as a single unit, and the activity concentrations would be similar to those for single reactor compartment packages that would be used under the reactor compartment packaging alternatives. Each reactor vessel would be within the NRC Class C limits. Other LLRW would meet Class A limits. No waste is anticipated to exceed Class C limits.

Disposal requirements for NRC Class C wastes are similar to the DOE Hanford Site Category 3 requirements. For NRC Class C waste disposal under Alternative 3 (Preferred Alternative), each reactor component with internal structure remaining inside as a single unit would be disposed of in a manner that meets the physical form and stability requirements of 10 CFR Part 61.56 and also meets the additional measures to protect against inadvertent intrusion to exceed the 500-year containment life (10 CFR Part 61.52(a)(2)).

LLRW would be transported by truck, ship, or rail from the commercial dismantlement locations to approved disposal facilities in accordance with current applicable DOT, NRC, or DOE regulations governing transportation

Therefore, as waste packaging, disposal, and transportation would all be conducted in accordance with existing regulations and site-specific permit/license requirements, impacts from LLRW disposal would be minimal.

3.2.4 Mitigation

No mitigation measures would be necessary under the Proposed Action and Alternatives, including the No Action Alternative, as analysis concluded that the public and occupational health and safety impacts would be considered minimal.

3.2.5 Summary of Impacts and Conclusions

Table 3.2-2 summarizes the impacts of the Proposed Action and alternatives on hazardous and radioactive waste management.

Table 3.2-2: Summary of Impacts and Conclusions on Hazardous and Radioactive Waste Management

Potential Impacts on Hazardous and Radioactive Waste Management	Alternatives			
	No Action	1	2	3
Impacts from long-term storage	○			
Impacts from towing to a commercial dismantlement facility		○	○	○
Impacts from dismantlement activities at a commercial dismantlement facility		○	○	○
Impacts from dismantlement activities at PSNS & IMF		○	○	
LLRW and Hazardous Waste Shipping		○	○	○

Notes: (1) Alternatives 1, 2, and 3 would be expected to have some impact that would be reduced as a result of project design changes, implementation of current or proposed management practices, monitoring, or mitigation. (2) ○ = minimal impact; Blank = no impact/not applicable; PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, LLRW = low-level radioactive waste.

3.3 American Indian Tribal Resources and Tribal Rights

This section of the Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) analyzes potential impacts from the Proposed Action and alternatives on federally recognized American Indian protected tribal resources, tribal rights, and Indian lands. Tribal resources and tribal rights of Pacific Northwest tribes specifically are analyzed for potential impacts on access of usual and accustomed (U&A) fishing and shellfish collecting grounds and stations; culturally significant vegetation and wildlife, including marine mammals; and water quality.

3.3.1 Methodology

3.3.1.1 Region of Influence

The Region of Influence (ROI) for protected tribal resources and tribal rights includes the following elements focused in the Pacific Northwest: (1) the shipping route of ex-Enterprise propulsion space section via heavy-lift ship from a commercial dismantlement facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) (following a route around South America); (2) areas within port and shipyard facilities at PSNS & IMF that may support dismantlement of ex-Enterprise; (3) Trench 94 rail system improvements at the Department of Energy (DOE) Hanford Site for disposal of reactor compartment packages; (4) barge transport of reactor compartment packages from PSNS & IMF to the Port of Benton barge slip; (5) the immediate vicinity and surrounding habitats of the barge slip, that may be subject to infrastructure improvements; and (6) land transport route requiring infrastructure improvements that may impact protected tribal resources between the barge slip and the DOE Hanford Site.

The following elements are not considered as part of the ROI for this analysis: (1) the tow route from Newport News, Virginia, to the commercial dismantlement facility; (2) partial dismantlement at a commercial dismantlement facility; and (3) transport of waste and recyclable materials from the commercial dismantlement facility to an approved waste disposal or recycling facility. There are no federally recognized American Indian lands that would be impacted by the tow route, commercial dismantlement facilities, or waste disposal and recycling facilities; and the United States (U.S.) Department of the Navy's (Navy's) outreach and research efforts have not identified tribal rights or protected tribal resources concerns. In addition, these elements (towing, commercial dismantlement, construction of reactor compartment packages, and transport of waste and recyclable materials) represent routine Navy operations that follow applicable federal, state, and local regulations and guidance.

3.3.1.2 Regulatory Framework

The federal government has a moral obligation of the highest responsibility and trust to federally recognized American Indian tribes (Seminole Nation v. United States, 316 U.S. 286 (1942)). This federal trust responsibility is a legal obligation to protect tribal self-governance, tribal lands, assets, resources, and treaty rights, and a duty to carry out the directions of treaties, federal statutes, and court cases regarding the protection and care of, and assistance to, the tribes and tribal citizens. As a foundational legal principle, the trust doctrine recognizes that federally recognized American Indian Tribes are separate and distinct nations with sovereignty over lands held in trust by the United States for the benefit of the tribes; Tribes retain all rights and interests they did not expressly cede to the United States; and the federal government has a fiduciary duty to the Tribes in consideration for the concessions made in treaties and in fulfillment of understandings and expectations that have arisen over

the course of the relationship between the United States and federally recognized American Indian tribes.

"Treaty tribes" refers to those tribes who negotiated a treaty with the federal government that was subsequently ratified by the U.S. Senate. In the Pacific Northwest, beginning in the 1850s, many American Indian tribes entered into treaties with the federal government, under which they relinquished their right to most of their territory (ceded lands) in exchange for monetary payments and other guarantees, such as use of their aboriginal fishing, hunting, gathering, and pasturing areas throughout their ceded lands. "Reserved tribal treaty rights" refer to continued access and harvest of natural resources on Indian reservations, and off-reservation rights to fish at usual and accustomed grounds and stations in common with all citizens and hunting and gathering on "open and unclaimed" lands. Most treaties negotiated in the Pacific Northwest specifically acknowledged the retained tribal right to fish at off-reservation U&A fishing grounds.

"Federally recognized Indian tribes" are an entity listed on the Department of the Interior's list under the Federally Recognized Indian Tribe List Act of 1994, which the Secretary currently acknowledges as an Indian tribe and with which the United States maintains a government-to-government relationship"(e.g., Federal Acknowledgement Process [25 Code of Federal Regulations Part 83]) [1](BIA, 2020). Not every federally recognized American Indian tribe has a reservation, and not all tribes received or retained federal recognition. Several tribes who were not treaty signers, whose treaties were terminated, whose populations had been greatly reduced, or whose federal recognition was later rescinded, continue to petition for federal recognition.

The trust responsibility is interpreted by the U.S. Supreme Court to require federal agencies, including The Department of Defense (DoD), to carry out activities in a manner the protects tribal rights. The DoD's American Indian and Alaska Native Policy, issued in 1998, established DoD policy for interactions with federally recognized American Indian tribes. DoD Instruction 4710.02, DoD Interactions with Federally-Recognized Tribes, implements that policy (latest version September 24, 2018). As defined in DoD Instruction 4710.02, "protected tribal resources" refers to "natural resources and properties of traditional or customary religious or cultural importance, either on or off Indian lands, retained by or reserved by or for Indian tribes through treaties, statutes, judicial decisions, or executive orders (EOs), including tribal trust resources." "Tribal trust resources," defined as "Indian lands or treaty rights to certain resources," include plants, animals, and locations associated with fishing, hunting, and gathering activities (Navy & DOE, 2012). Also as defined in DoD Instruction 4710.02, "Indian lands" are "Any lands to which the title is either held in trust by the United States for the benefit of any Indian tribe or Indian, or held by an Indian tribe or Indian subject to restrictions by the United States against alienation."

The Navy policy for consultation with federally recognized American Indian tribes was established in 1999 and updated in 2019, Secretary of the Navy Instruction 11010.14B, *Department of the Navy Policy for Consultation with Federally Recognized Indian Tribes, Alaska Native Tribal Entities, and Native Hawaiian Organizations*. This instruction implements DoD policy within the Navy and encourages ongoing consultations and communications (Navy & DOE, 2012). Commander, Navy Region Northwest Instruction 11010.14A, *Policy for Consultation with Federally-Recognized American Indian and Alaska Native Tribes* (first established in 2009, latest revision May 10, 2021), sets forth policy, procedures, and

[1] BIA is an acronym for U.S. Bureau of Indian Affairs

responsibilities for consultations with federally recognized American Indian and Alaska Native tribes in the Navy Region Northwest area of responsibility. The Navy must consult with tribes whenever proposing an action that may have the potential to significantly affect protected tribal resources, tribal rights, or Indian lands. Installations meet with tribes in their area, including tribes historically or culturally affiliated with the lands managed by the installation, regardless of whether they have treaty rights or not.

DOE Order 144.1, U.S. *Department of Energy American Indian & Alaska Native Tribal Government Policy*, commits DOE to consult with tribal governments to ensure tribal rights and concerns are considered prior to DOE taking actions, making decisions, or implementing programs that may affect tribes.

EOs requiring consultation with tribes include EO 13175, *Consultation and Coordination with Indian Tribal Governments*; the Presidential Memorandum dated November 5, 2009, emphasizing agency needs to comply with EO 13175; EO 13007, *Indian Sacred Sites*; and the presidential memorandum dated April 29, 1994, *Government-to-Government Relations with Native American Governments*.

3.3.1.3 Best Management Procedures

Best management practices include policies, practices, and measures that would be implemented to minimize impacts associated with the Proposed Action and alternatives. The federal government engages in government-to-government consultation with federally recognized American Indian tribes regarding traditional resources, tribal rights, and other concerns, in recognition of tribal sovereignty. As part of the EIS scoping process, and the Draft EIS/OEIS notification and public comment process, the Navy has contacted tribes who may have interest in the Proposed Action. Consultation was not required for the Preferred Alternative (Alternative 3) identified in this EIS/OEIS.

3.3.1.4 Approach to Analysis

In considering impacts on federally recognized American Indian protected tribal resources, tribal rights, and Indian lands, this analysis considers the potential for the Proposed Action and alternatives to impede tribal access to, and the use of, U&A fishing grounds and to affect biological resources with traditional value, or their habitat (e.g., anadromous fish species that migrate through salt water such as salmon, steelhead, lamprey, eel, and sturgeon; shellfish; and other wildlife including marine mammals that are part of subsistence and ceremonial activities of tribes) or water quality. A detailed analysis of biological resources is summarized in Section 3.5 (Biological Resources) of this EIS/OEIS. As U&A fishing grounds are associated specifically with the Pacific Northwest, the approach considers tribal concerns previously expressed to the Navy as part of other actions in the Pacific Northwest, which include the Navy and DOE 2012 *Final Environmental Assessment on the Disposal of Decommissioned, Defueled Naval Reactor Plants from USS Enterprise (CVN 65),* hereinafter referred to as the 2012 EA (Navy & DOE, 2012), and the *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants*, hereinafter referred to as the 1996 EIS (Navy & DOE, 1996). In addition, the Navy recently completed the *Final Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement, Northwest Training and Testing Activities* (Navy, 2020), which discusses protected tribal resources along the coast of Washington and within Puget Sound, including PSNS & IMF and other Navy facilities, as well as concerns expressed to the Navy as part of the public involvement process and scoping for this EIS/OEIS.

3.3.2 Affected Environment

In the 1850s, the United States negotiated treaties with a number of tribes in the Pacific Northwest. These tribes ceded lands to the United States while reserving certain rights for themselves, including the right to take fish and shellfish at their off-reservation traditional fishing grounds and to hunt and gather roots and berries on their traditional lands (Bernholz & Weiner, 2008).

Descendants continue to exercise these rights as part of a tribal lifestyle. In the Pacific Northwest, tribal rights are co-managed by tribes along with the states and federal government. Court cases have reaffirmed the rights of Indian tribes to obtain resources in off-reservation U&A fishing grounds and stations (*Sohappy v. Smith*/*U.S. v. Oregon* [Belloni Decision], 1969; *U.S. v. Washington*, 384 F. Supp. 312 [Boldt Decision], 1974). Tribes are entitled to half the harvestable surplus fish in the Columbia River regulated under *U.S. v. Oregon* (Columbia River Tribes Inter-Tribal Fisheries Commission, 2020). The Boldt Decision defined U&A fishing grounds and outlined the geography of U&A grounds of 14 treaty tribes in Washington (Boldt Decision, 332–33). The ruling in the subsequent Shellfish Case (*U.S. v. Washington*, 873 F. Supp. 1422 [Rafeedie Decision], 1994) determined that shellfish are to be considered the same as fish under the treaties. The courts have interpreted the expressed treaty rights to include conservation of the resources and a right of habitat (Bernholz & Weiner, 2008). In response to these rulings, most treaty tribes in the Pacific Northwest organized intertribal commissions who continue to actively and collectively manage and protect their tribal treaty resources and rights.

The following federally recognized Pacific Northwest tribes have tribal rights and interests considered in the Pacific Northwest ROI for this analysis:

- Confederated Tribes and Bands of the Umatilla Indian Reservation
- Confederated Tribes of the Chehalis Reservation
- Confederated Tribes of Grand Ronde
- Confederated Tribes of Siletz Indians
- Confederated Tribes of the Warm Springs Reservation of Oregon
- Confederated Tribes and Bands of the Yakama Nation
- Cowlitz Indian Tribe
- Hoh Tribe
- Jamestown S'Klallam Tribe
- Lower Elwha Tribal Community
- Lummi Nation
- Makah Indian Tribe
- Nez Perce Tribe
- Port Gamble S'Klallam Tribe
- Quileute Indian Nation
- Quinault Indian Nation
- Shoalwater Bay Tribe
- Skokomish Tribal Nation
- Suquamish Indian Tribe of the Port Madison Reservation
- Swinomish Indian Tribal Community

In 2012, the Navy invited Pacific Northwest tribes with tribal rights in the ROI to evaluate the draft analysis in the 2012 EA (Navy & DOE, 2012). The Suquamish Indian Tribe expressed concern for potential bottom scour during docking at PSNS & IMF, which could affect fish habitat (Navy & DOE, 2012). The

Navy determined there would be no significant effects or major impacts on protected tribal resources and tribal rights resulting from the disposal of decommissioned, defueled naval reactor plants from ex-Enterprise (Navy & DOE, 2012).

As part of initial outreach for this EIS/OEIS, in 2019 the Navy sent notifications to all tribes in the general vicinity of the various project elements. The Suquamish Indian Tribe responded through a letter submitted in the public involvement process that they have an interest in participating in development of this EIS/OEIS. The Navy sent a tailored letter to the Chairperson of the Suquamish Indian Tribe on August 17, 2022. The letter can be found in Appendix B (Public Involvement and Distribution) of this EIS/OEIS. The Suquamish Indian Tribe also provided a comment letter during the Draft EIS/OEIS public comment period which can be found in Appendix C (Public Comments and Responses) of this EIS/OEIS.

3.3.2.1 Western Washington Coast and Columbia River

Under separate treaties signed between 1854 and 1856, much of the land along the Western Washington coast, along the Columbia River between the mouth and the Port of Benton barge slip, and within the DOE Hanford Site was ceded by treaty, to the United States by regional American Indian tribes. These treaties include the Treaties of Medicine Creek, Neah Bay, Point Elliott, and Point No Point; Quinault Treaty; Treaty with the Confederated Tribes of the Willamette Valley; Middle Columbia River Treaty; Walla Walla Treaty; Yakama Treaty; and Nez Perce Treaty. Under most of these treaties, tribes specifically retained their rights to fish, hunt, and gather roots and berries and to pasture horses and cattle on open and unclaimed lands (Bernholz & Weiner, 2008). Tribal fishing rights are recognized on rivers within the ceded lands, including the Columbia River. There are other federally recognized American Indian tribes, such as the Cowlitz Tribe and Shoalwater Bay Tribe, who did not sign treaties but who have other rights and interests in managing protected tribal resources such as fish and fish habitat.

Currently, several treaty tribes in western Washington collectively form the Northwest Indian Fisheries Commission, which is committed to management of interconnected protected tribal resources and tribal rights (Northwest Treaty Tribes, 2020). Tribes also individually manage their resources and tribal rights. Tribal marine resource gathering areas include traditional fishing grounds; whaling areas; and seaweed-, mussel-, abalone-, and clam-gathering grounds, some of which extend beyond 12 nautical miles (Navy, 2020). Many marine species are culturally significant to the tribes of coastal Washington and Oregon and are harvested for ceremonial, subsistence, and commercial purposes (Navy, 2020). These activities may be used to pass down traditional knowledge and cultural history to younger generations. The availability and health of marine resources and supporting habitats are therefore a concern for regional tribes.

Federal lands have been acquired and improved to provide access to U&A fishing grounds along the Columbia River (Columbia River Treaty Fishing Access Pub. L. No. 100-581, 102 Stat. 2944, 1988). A zone for exclusive Indian commercial fishing extends along a 147-mile stretch of the Columbia River between Bonneville and McNary dams, approximately 50 river miles downstream from the Port of Benton barge slip. Within this zone, four treaty tribes (the Confederated Tribes of the Umatilla Indian Reservation [CTUIR], Confederated Tribes of Warm Springs, Confederated Tribes and Bands of the Yakama Nation [Yakama Nation], and Nez Perce Tribe) collectively manage fishery resources and protect their reserved treaty rights as part of the Columbia River Inter-Tribal Fish Commission (Columbia River Tribes Inter-Tribal Fisheries Commission, 2020). Individual tribes are also reintroducing fish and enhancing habitat along the Mid-Columbia River to support their treaty rights (Washington Department of Fish and Wildlife, 2020).

3.3.2.2 Puget Sound Naval Shipyard & Intermediate Maintenance Facility and Sinclair Inlet

Since preparation of the 2012 EA, which determined there would be no significant effects or major impacts on protected tribal resources and tribal rights resulting from the disposal of naval reactor plants from ex-Enterprise at PSNS & IMF (Navy & DOE, 2012), certain tribes in Puget Sound have expressed concerns regarding the potential of Navy activities to impede access to adjudicated tribal U&A fishing grounds and/or to damage tribal fishing gear (Navy, 2020). PSNS & IMF and Sinclair Inlet lie within the U&A fishing grounds of the Suquamish Indian Tribe. The Suquamish Indian Tribe has a right to take a percentage of fish that pass through their U&A areas and has a salmon fishery at Gorst Creek, at the upper reaches of Sinclair Inlet. The Suquamish Indian Tribe fishes for hatchery salmon in Sinclair Inlet as these fish return to Gorst Creek. The Tribe is concerned about potential impacts on fish, shellfish, and their habitat (Suquamish Tribe, 2021).

3.3.2.3 Port of Benton Barge Slip

The Port of Benton barge slip is on Lake Wallula, which is the Columbia River impoundment created by McNary Dam, and is on the west shoreline at river mile 342.8 (see Figure 2-15). The element of the alternatives associated with barge slip improvements includes aquatic habitats of the Columbia River, considered in this analysis to extend from a half mile upstream of the barge slip, a half mile across the river, and a half mile downstream of the barge slip. The barge slip is on lands ceded to the United States by ancestral tribes and bands of the CTUIR. Descendants continue to rely on the water and access lands to hunt, fish, collect plants and other resources, and to pray. Tribal priorities encourage protection of traditional use areas and protected tribal resources (Stapp, 2013), as well as shoreline and fish management (Washington Department of Fish and Wildlife, 2020).

3.3.2.4 Land Transport Route from the Port of Benton to Final Disposal Location at the Department of Energy Hanford Site

The land transport route commences on Port of Benton land as it departs the Port of Benton barge slip. The Navy uses DOE road systems to transport reactor compartment packages from the Port of Benton barge slip to Trench 94 in the 200 East Area of the DOE Hanford Site. The land transport route from the barge slip initially crosses the DOE Pacific Northwest National Laboratory (PNNL), which is managed by the DOE Pacific Northwest Site Office. After crossing PNNL, the land transport route continues on to the DOE Hanford Site, managed by DOE-Richland, to the final disposal location at Trench 94.

The DOE sites are along the Columbia River on lands ceded to the U.S. Government by ancestral tribes and bands of the Yakama Nation and CTUIR and near lands ceded by the Nez Perce Tribe and others who traditionally used the area and who exercise their tribal rights at the DOE Hanford Site. In addition, the Wanapum Band are a non-federally recognized American Indian tribe living adjacent to the DOE sites and DOE consults with the Wanapum for actions at the DOE Hanford Site. There are other Indian tribes in the area whose ceded lands did not include any portion of the DOE sites but who exercise their tribal rights along the Columbia River for fishing (e.g., Confederated Tribes of Warm Springs).

The Washane, or Seven Drums religion, which has ancient roots and had its start in the area where the DOE sites are now located, is still practiced by many people on the Yakama, Umatilla, Warm Springs (central Oregon), and Nez Perce Reservations. Native plant and animal foods, some of which can be found on the DOE sites, are used in ceremonies performed by tribal members (Navy & DOE, 1996). DOE ensures access is available to members of the Wanapum, Yakama Nation, CTUIR, Colville, and Nez Perce tribes to gather traditional resources and for practicing traditional cultural and religious ceremonies in accordance with tribal rights, EOs, and DOE policy (Chatters, 1982; DOE, 2021).

DOE has set aside a Preservation Designated Area (PDA) along the Columbia River at the DOE PNNL Site for tribal use that is intended to enhance the quantity and quality of biological resources that are culturally significant to tribes (DOE, 2018). The PDA is considered a sacred site under EO 13007, as discussed in Section 3.7 (Cultural Resources). Tribal revegetation activities on the PDA include seed collection and planting of native plants. The land transportation route passes through the tribal PDA on the DOE PNNL Site for approximately 0.6 mile (1 kilometer) after it departs the Port of Benton barge slip.

3.3.3 Environmental Consequences

This analysis considers potential impacts of the Proposed Action and alternatives on federally recognized American Indian protected tribal resources, tribal rights, and Indian lands in Washington. Potential impacts are analyzed as they relate to impeding access to U&A fishing grounds, impacts on biological resources and their habitat (e.g., threatened and endangered species, essential fish habitat), and impacts on water quality through introduced contamination or debris in Washington only. For Alternative 3 (Preferred Alternative), the Navy is examining reasonably foreseeable impacts for commercial facilities on private land. Reserved treaty rights do not apply to commercial dismantlement facilities in Virginia, Texas, and Alabama. The Navy has conducted outreach to tribes in these areas, and no tribal issues have been identified.

3.3.3.1 No Action Alternative

As stated in Section 2.3.1 (No Action Alternative), the Navy would store the entire ex-Enterprise for an indefinite period of time at an existing shipyard in the Hampton Roads Metropolitan Area, Virginia. Storage in the existing shipyard is consistent with past and current uses at Newport News Shipbuilding. Navy outreach and research efforts have not identified Indian lands, tribal rights issues, or protected tribal resources of concern at the existing shipyards. As described in Chapter 2 (Description of Proposed Action and Alternatives) and Section 3.3.1.1 (Region of Influence), the storage of ex-Enterprise at an existing shipyard in Newport News, Virginia is consistent with past and current uses at Newport News Shipbuilding. Indefinite storage is accomplished using established processes and techniques and does not have the potential to significantly impact tribal rights, protected tribal resources, or Indian lands under the No Action Alternative.

3.3.3.2 Alternative 1: Single Reactor Compartment Packages

The major elements of Alternative 1 are described in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages). As described in Chapter 2 (Description of Proposed Action and Alternatives) and Section 3.3.1.1 (Region of Influence), the tow of ex-Enterprise from Newport News, Virginia, to a commercial dismantlement facility; partial dismantlement at a commercial dismantlement facility; and transport of waste and recyclable materials from a commercial dismantlement facility to an approved waste disposal or recycling facility are not analyzed in detail in this section. These activities are accomplished using established processes and techniques and do not have the potential to significantly impact tribal rights, protected tribal resources, or lands.

3.3.3.2.1 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

Following ship dismantlement and recycling of elements of ex-Enterprise at a commercial dismantlement facility, the remaining propulsion space section with its eight reactor plants would be transported to PSNS & IMF at Bremerton, Washington, via heavy-lift ship, as described in Section 2.3.2.4 (Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement

Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility [Following Route Around South America]) and Figure 2-5.

Transit would occur within established shipping lanes and in compliance with all applicable regulations, and would not impede access to and use of U&A fishing grounds. Although unlikely, loss of or damage to tribal fishing gear could result from transit of the propulsion space section via heavy-lift ship through U&A fishing grounds along the Washington coast and Puget Sound. The propulsion space section transit through the tribe's U&A (fishing grounds and stations) would be commensurate with the time required for live aircraft carrier passage. The anticipated travel speed of the propulsion space section being brought into port is less than 10 knots, with a security zone surrounding the ship of 100 yards (per 33 Code of Federal Regulations Part 165). Heavy-lift ship transportation of the propulsion space section and other support tugs to bring the propulsion space section into port would conform to standard navigational practices to avoid potential interactions with fixed gear (Navy, 2020). Tribal fishermen mark their gear in accordance with fishing regulations and it is also anticipated that any other fishing gear placed in Washington state waters would be marked accordingly per Washington state regulations.

While the Navy provides courtesy notifications to Tribes, the Navy does not notify the public of Navy ship movements, so gathering time for spectators would be limited to when the heavy-lift ship becomes visible in Puget Sound. Responsible authorities would be accountable for enforcing marine law and mitigating nuisances such as congested recreational boaters if issues were to arise. Non-Navy ship traffic should still be vigilant during operations in order to avoid maritime hazards per Revised Code of Washington 79A.60.

The Suquamish Indian Tribe has previously expressed concern for potential bottom scour during docking at PSNS & IMF, which could affect fish habitat (Navy & DOE, 2012). For the 2012 EA (Navy & DOE, 2012) as well as for this EIS/OEIS, the Navy has concluded that scour and propeller wash are not a concern at PSNS & IMF based on calculations of draft maximum and because the heavy-lift ship would unload the propulsion space section in deep water before entering Sinclair Inlet. The propulsion space section would have a smaller draft (approximately 23.5 feet [ft.]) than current aircraft carriers (approximately 37 ft.) and would be brought into port under tug. Based on the 2007 hydrographic survey (Sinclair Inlet to Rich Passage, Report F00541) by National Oceanic and Atmospheric Administration, water depths are greater than the draft maximum for the propulsion space section. The draft required by a heavy-lift ship to offload the propulsion space section (approximately 76 ft.) is prohibitive to occur in Sinclair Inlet due to water depths. Additional details for offloading the propulsion space section in the Central Basin of Puget Sound would be determined if the Navy ultimately selects Alternative 1 or 2. The travel distances in this EIS/OEIS utilize the heavy-lift ship transiting to PSNS & IMF as a conservative scenario for analyses of impacts presented in this EIS/OEIS.

As described in Section 3.5 (Biological Resources) transit activities would have minimal impacts on biological resources and water quality with Navy use of best management practices. The Navy has determined that impacts on protected tribal resources and tribal rights from relocation of the propulsion space section under Alternative 1 would be minimal. Navy Region Northwest regularly meets with local tribes and, if Alternative 1 is selected, the Navy would consult about impacts of this alternative on protected tribal resources and tribal rights.

3.3.3.2.2 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages (No In-Water Work)

As described in Section 2.3.2.5 (Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Dual Reactor Compartment Packages [No In-Water Work]), preparation for shipment from PSNS & IMF would involve liquid removal (draining of the piping, tubing, and fluid systems remaining in the reactor compartment package), equipment removal, and reactor compartment containment. These activities are considered normal pier-side and dry dock actions, with similar activities analyzed previously resulting in a less than significant impact on biological resources and water quality (Navy & DOE, 1996). Work performed at PSNS & IMF would follow typical past and ongoing shipyard work practices and would be in accordance with all agreements, permits, and regulations. Removal of liquid, equipment, and hazardous material, and preparation for shipment, would be done pier-side. The Navy has determined, based on the very low likelihood of exposure of biological resources to radiation and hazardous materials, that pier-side and dry dock work described in Section 2.3.2.5 (Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages [No In-Water Work]) would have no significant impacts on biological resources and would not introduce contaminants into the water. The work would not impede access to and use of U&A fishing grounds.

The Navy has determined that impacts on protected tribal resources and tribal rights as a result of pier-side and dry dock work and preparation for shipment under Alternative 1 would be minimal.

3.3.3.2.3 Install Rail System for Reactor Compartment Packages in Trench 94 at the DOE Hanford Site

Trench 94 at the DOE Hanford Site is in an isolated area about 7 miles from the Columbia River that contains various cruiser and submarine reactor compartment packages. PSNS & IMF would construct additional rail structures that would be added within the existing area of Trench 94 to support the single reactor compartment packages, requiring limited excavation of the trench floor. The 1996 EIS analyzes the placement of up to 220 reactor compartment packages at Trench 94. The 2012 EA includes ex-Enterprise within this 220 package total. Trench 94 at the DOE Hanford Site is not a location currently used for tribal resource gathering; however, Trench 94 is within the DOE Hanford Site, which is accessed by tribes who continue to exercise their tribal rights, for example, for resource gathering and for spiritual practices. As the installation of additional rail structures would not change the use of Trench 94, and compliance with all applicable federal, state, and local environmental laws and regulations would apply, no significant impacts on water resources or to biological resources are anticipated. The Navy concludes that impacts on protected tribal resources and tribal rights as a result of a new rail system in Trench 94 at the DOE Hanford Site under Alternative 1 would be minimal.

3.3.3.2.4 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

Transport of ex-Enterprise reactor compartment packages, as described in Section 2.3.2.7 (Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip), would occur along the same route currently used for various submarine and cruiser packages. Transport of ex-Enterprise reactor compartment packages from PSNS & IMF to the Port of Benton barge slip in the city of Richland, Washington, would occur in established shipping lanes and be conducted in compliance with applicable regulations. Navy and DOE considered drafts of the shipping barges along this route previously and determined reactor compartment disposal packages would not pose a problem for shipping because the shallowest river

depths were encountered near the barge slip, which could be controlled by river flow at downstream dams (Navy & DOE, 1996, pp. 3–7). Therefore, scour of sensitive habitat for protected tribal resources would not occur through barge transport. Barge transport does not impede tribal access to and use of U&A fishing places. Barge transport could interfere with tribal fishing only if tribal fishers are using the shipping lanes in the Columbia River and only for the brief period for the barge to pass, as is typical for commercial shipping lanes and not unique to this action.

Under Alternative 1, the number of reactor compartment shipments per year from PSNS & IMF would be consistent with the current number of annual reactor compartment package shipments (Navy & DOE, 1996, 2012). The current water transport route of reactor compartment packages from PSNS & IMF to the Port of Benton barge slip and the disposal location on the DOE Hanford Site were previously analyzed, and the Navy determined that barge transport would have no significant impacts on biological resources, and would have no effect on Endangered Species Act-listed species that may occur along the barge transport route (Navy & DOE, 1996). As discussed in Section 3.5 (Biological Resources), although the barge route traverses through numerous habitat types and biomes, the Navy has assessed the stressors generated by a single barge transport of the reactor compartment packages to be discountable, as barge transport is a normal maritime activity. The Navy has based this determination on a history of transporting reactor compartment packages to the barge slip for final disposal at the DOE Hanford Site and compliance with environmental regulations that ensure safe transport.

Alternative 1 uses transport and dismantlement activities that have occurred in the past with little to no water resource impacts. Additionally, Alternative 1 does not propose to change the methodologies or the compliance with all applicable federal, state, and local environmental laws and regulations, and all current regulatory requirements would apply. Because of the historical lack of tribal resource or tribal right impacts, and no new activities under this alternative, the Navy concludes transport of the reactor compartment packages via water would have minimal impacts on protected tribal resources and tribal rights.

3.3.3.2.5 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

Once a reactor compartment package is unloaded at the Port of Benton barge slip, it is transported overland to the DOE Hanford Site. See Section 2.3.2.8 (Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site) for complete description of overland transport for the reactor compartment packages (see Figure 2-12).

Under Alternative 1, the land transport route is the same as currently used for various submarine and cruiser packages. The time needed to transport a package between the Port of Benton barge slip and the Wye Barricade Bypass along the transport route would be approximately four to six hours. This section of the highway is open to the public and would be closed with a rolling road closure. The land transport route is currently accessed by tribal members exercising their tribal rights for tribal resource gathering and other activities. As described in Section 3.5 (Biological Resources), impacts on biological resources would be minimal. The Navy concludes land transport to Trench 94 at the DOE Hanford Site would have minimal impacts on protected tribal resources and tribal rights.

Because each major element would have minimal impacts, the Navy has determined that implementation of Alternative 1 would have minimal impacts on protected tribal resources and tribal rights.

3.3.3.3 Alternative 2: Dual Reactor Compartment Packages

Under Alternative 2 – Dual Reactor Compartment Packages (described in Section 2.3.3 [Alternative 2 – Dual Reactor Compartment Packages]) all elements of activity, up to and including transport of the propulsion space section, are the same as those under Alternative 1. The estimated amount of time for dismantlement and transport would differ from Alternative 1 due to the construction and shipment of four larger and heavier dual reactor compartment packages instead of eight single reactor compartment packages. Alternative 2 requires infrastructure modifications at the Port of Benton barge slip and the transport route at the DOE Hanford Site to facilitate transport of the larger and heavier dual reactor compartment packages as compared to Alternative 1.

The major elements of Alternative 2 are described below, along with their potential impacts on protected tribal resources and tribal rights. As described in Chapter 2 (Description of Proposed Action and Alternatives) and Section 3.3.1.1 (Region of Influence), the tow of ex-Enterprise from Newport News, Virginia, to a commercial dismantlement facility; partial dismantlement at a commercial dismantlement facility; and transport of waste and recyclable materials from a commercial dismantlement facility to an approved waste disposal or recycling facility are not analyzed in detail in this section. These activities are accomplished using established processes and techniques and do not have the potential to significantly impact tribal rights, protected tribal resources, or Indian lands.

3.3.3.3.1 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

As with Alternative 1, following ship dismantlement and recycling of elements of ex-Enterprise at a commercial dismantlement facility, the remaining propulsion space section would be transported to PSNS & IMF at Bremerton, Washington, via heavy-lift ship as described in Section 2.3.3.4 (Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility [Following Route Around South America]) and Figure 2-5. The analysis and conclusions for this activity as described under Alternative 1 in Section 3.3.3.2.1 (Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility [Following Route Around South America]) would be the same as for Alternative 2. Navy Region Northwest regularly meets with local tribes and, if Alternative 2 is selected, the Navy would consult about impacts of this alternative on protected tribal resources and tribal rights.

3.3.3.3.2 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Four Dual Reactor Compartment Packages (No In-Water Work)

As with Alternative 1, preparation for shipment from PSNS & IMF would involve liquid removal (draining of the piping, tubing, and fluid systems remaining in the reactor compartment package), equipment removal, and reactor compartment containment. Because there would be no significant impacts on biological resources and no introduction of contaminants into the water, the Navy has determined that impacts on protected tribal resources and tribal rights as a result of pier-side and dry dock work and preparation for shipment under Alternative 2 would be minimal.

3.3.3.3.3 Port of Benton Barge Slip Modifications

Port of Benton barge slip modifications (as described in Section 2.3.3.6 [Port of Benton Barge Slip Modifications]) would require infrastructure modifications to the barge slip due to the heavier weight and larger size of the dual reactor compartment packages. The current slip would be widened 18 ft.,

making the new slip 80 ft. wide, and extended by 15 ft. in length, making the new length 165 ft. The widening would require the removal of the south jetty. To minimize settling of the substrate, 3 ft. of soil under the area where the south jetty currently stands would be removed and backfilled with gravel to benefit juvenile salmonids. A 70 ft. sheet pile wall would be vibrated into the ground before removing the jetty, to substantially reduce impacts on salmonids in the river by dissipating the energy into the ground before affecting the water. The existing slip headwall would be strengthened to handle the increased weight of the larger loads. Construction would include 24 landside pipe piles, 30 inches in diameter, spaced 10 ft. apart with a concrete slab on top.

Port of Benton barge slip modifications may impede access to U&A fishing grounds while construction is underway if tribal fishermen use the surrounding area for fishing. Fish behavior may make them more difficult to catch during the season of construction. Protected tribal resources, including juvenile fish and their habitat, are susceptible to impacts from construction.

Temporary impacts on biological resources and water quality would occur as a result of Port of Benton barge slip modifications. Based on the protective measures to contain turbidity and to reduce the likelihood of chemical contamination into the Columbia River and the addition of favorable salmonid river bottom habitat following removal of the south jetty, the Navy has determined that in-water construction activities and associated water and sediment quality stressors would have some impacts on biological resources.

These impacts are described in detail in Section 3.5 (Biological Resources). Potential long-term impacts on biological resources would be beneficial with implementation of best management practices and adherence to existing regulations. Coordination with local tribes and timing of in-water work windows would help reduce potential impacts on tribal fishermen during important fish runs. Should Alternative 2 be selected, the Navy would consult with affected tribes about potential impacts associated with proposed improvements at the Port of Benton barge slip.

Based on current knowledge and communication with tribes, the Navy has determined that some impacts on protected tribal resources and tribal rights would occur under Alternative 2, but these would be reduced through implementation of best management practices. The Navy would re-evaluate this determination as necessary if tribes request additional communications.

3.3.3.3.4 Road Modifications Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site

The Navy would use DOE road systems to transport reactor compartment packages from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site, similar to Alternative 1 (see Figure 2-12). Current packages range between 1,000 and 1,680 tons. Under Alternative 2 only, road modifications are analyzed at up to 11 locations on the transport route to support larger transporters required for transporting heavier packages (see Figure 2-16). Improvements such as cutting or filling to reduce the vertical curve, filling dips in roads, paving medians, filling low sides or cutting high sides to reduce side slope, and filling road shoulders to improve intersections would be made.

The transport route passes through the tribal PDA at the DOE PNNL Site, which was established for the purpose of enhancing culturally significant biological resources, for approximately 0.6 mile (1 kilometer). Tribal revegetation activities on the PDA include seed collection and planting of native, harvestable plants. The Navy would reduce the potential for impacts by restricting heavy machinery use to existing roads through the PDA. The only activities that would be permitted on the PDA would be within the non-vegetated road prism.

In addition, should Alternative 2 be selected, the Navy would consult with tribes regarding potential impacts on the PDA and invite a tribal monitor(s) to monitor road improvements through the PDA under this alternative. As detailed in Section 3.5 (Biological Resources), construction impacts (e.g., crushing of vegetation, compaction of soils, spreading of invasive species) from transport route upgrades on biological resources would be minimal. Upgrades to the land transportation route would not impede access to U&A fishing grounds, as they would occur on land away from U&A fishing grounds and would not result in closures to roads accessing these fishing grounds.

Based on current knowledge and communication with tribes, the Navy has determined that some impacts on protected tribal resources and tribal rights may occur from road improvements. However, as currently envisioned, road modifications would remain within the existing non-vegetated road prism and construction laydown areas would be established in previously disturbed areas to minimize potential impacts on tribal and ecological resources and tribal rights. Additional mitigation measures may include tribal monitor(s) of activities through the PDA. Should Alternative 2 be selected, the Navy would consult with tribes and coordinate with DOE and other parties as appropriate.

3.3.3.3.5 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

As with Alternative 1, the Navy concludes that impacts as a result of installing a new rail system in Trench 94 at the DOE Hanford Site would have minimal impacts on protected tribal resources and tribal rights.

3.3.3.3.6 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

The four dual reactor compartment packages would be transported by a newly constructed barge that is larger than the existing design, requiring infrastructure upgrades to the Port of Benton. This barge would be capable of handling the larger dual reactor compartment packages via the transport route (see Figure 2-6) from PSNS & IMF to the Port of Benton barge slip at Richland, Washington, similar to Alternative 1. The Navy concludes transport of the reactor compartment packages via water would have minimal impacts on protected tribal resources and tribal rights.

3.3.3.3.7 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

As with Alternative 1, the land transport route is the same as currently used for various submarine and cruiser packages. The land transport route is currently accessed by tribal members exercising their tribal rights for tribal resource gathering and other activities, but only rolling road closures would occur for a period of hours. The Navy concludes land transport to Trench 94 at the DOE Hanford Site would have minimal impacts on protected tribal resources and tribal rights.

Because each major element would have either minimal impacts or some impacts, the Navy has determined that implementation of Alternative 2 would overall have some impacts on protected tribal resources and tribal rights, but these impacts would be reduced through implementation of best management practices.

3.3.3.4 Alternative 3 (Preferred Alternative): Commercial Dismantlement

Under Alternative 3 (Preferred Alternative) – Commercial Dismantlement (described in Section 2.3.4 [Alternative 3 {Preferred Alternative} - Commercial Dismantlement]), the contracted dismantlement of ex-Enterprise would occur at an authorized commercial ship dismantlement facility in Virginia, Texas, or

Alabama, including cutting apart the eight reactor plants into segments for packaging into several hundred small containers for subsequent disposal at a DOE and/or authorized commercial low-level radioactive waste facility. Navy outreach and research efforts have not identified Indian lands, tribal rights issues, or protected tribal resources of concern at the commercial dismantlement or waste disposal facilities. As described in Chapter 2 (Description of Proposed Action and Alternatives) and Section 3.3.1.1 (Region of Influence), the tow of ex-Enterprise from Newport News, Virginia, to a commercial dismantlement facility; partial dismantlement at a commercial dismantlement facility; and transport of waste and recyclable materials from a commercial dismantlement facility to an approved waste disposal or recycling facility are not analyzed in detail in this section. These activities are accomplished using established processes and techniques and do not have the potential to significantly impact tribal rights, protected tribal resources, or Indian lands.

3.3.4 Mitigation

All activities would comply with all applicable federal, state, and local environmental and occupational safety and health laws and regulations. No mitigation measures are required because no major impacts requiring mitigation are reasonably foreseeable on t tribal rights, protected tribal resources, and Indian lands.

3.3.5 Summary of Impacts and Conclusions

Table 3.3-1 summarizes the impacts of the alternatives on protected tribal resources and tribal rights.

Table 3.3-1: Summary of Impacts and Conclusions on Federally Recognized American Indian Protected Tribal Resources and Tribal Rights

Potential Impacts on Federally Recognized American Indian Protected Tribal Resources and Tribal Rights	Alternatives			
	No Action	1	2	3
Activities that would impede access to Usual & Accustomed Fishing Areas		○	◑	
Impacts on biological resources with traditional value, or their habitat		○	◑	
Impacts on tribal resource gathering and other activities		○	○	
Bottom scour/propeller wash (impacts on fish habitat)				
Impacts on water quality		○	◑	

Notes: ◑ = Some impact but reduced as a result of project design changes, implementation of current or proposed management practices, monitoring, or mitigation; ○ = minimal impact; Blank = no impact/not applicable

3.4 Socioeconomics and Environmental Justice

This section of this Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) describes potential impacts on socioeconomic and environmental justice conditions as a result of the Proposed Action and alternatives. Socioeconomics comprise the basic attributes and resources associated with the human environment, particularly population and economic activity. Economic activity typically encompasses employment, personal income, and industrial growth.

The United States (U.S.) Environmental Protection Agency (EPA) defines Environmental Justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (EPA, 2011). Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), requires consideration of whether the Proposed Action and alternatives would disproportionately affect minority or low-income groups (59 Federal Register 7629 [1994]). EO 12898 requires that no minority or low-income population group should bear a disproportionate share of potential adverse environmental and socioeconomic impacts.

Socioeconomic and environmental justice data herein are presented at the city, county, regional, state, and national levels to analyze baseline socioeconomic conditions in the context of local, regional, state, and national trends. Data has been collected from the U.S. Census Bureau and previously published documents issued by federal, state, and local agencies.

3.4.1 Methodology

3.4.1.1 Region of Influence

The detailed Region of Influence (ROI) for socioeconomic and environmental justice analysis is defined and outlined in this EIS/OEIS as the independent cities and counties immediately surrounding the naval and commercial facilities where the transport, dismantlement, and disposal of ex-Enterprise may occur. The ROI includes locations in the states of Washington, Virginia, Texas, and Alabama, encompassing the following areas:

- The ROI for Washington includes the city of Bremerton and Kitsap County, in which Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) is located; the city of Pasco and Franklin County; as well as the city of Richland, city of Kennewick, and Benton County, where the Department of Energy (DOE) Hanford Site is located (Figure 3.4-1 and Figure 3.4-2).
- The ROI for Hampton Roads Metropolitan Area, Virginia, includes the independent cities (i.e., not included in a county) of Newport News, Norfolk, Hampton, Virginia Beach, Chesapeake, Portsmouth, Poquoson, Suffolk, and Williamsburg, as well as the counties of Isle of Wight, Surry, York, and James City (Figure 3.4-3).
- The ROI for Brownsville, Texas includes the city of Brownsville and the surrounding Cameron, Hidalgo, and Willacy counties (Figure 3.4-4).
- The ROI for Mobile, Alabama, includes the city of Mobile, and Mobile and Baldwin counties (Figure 3.4-5).

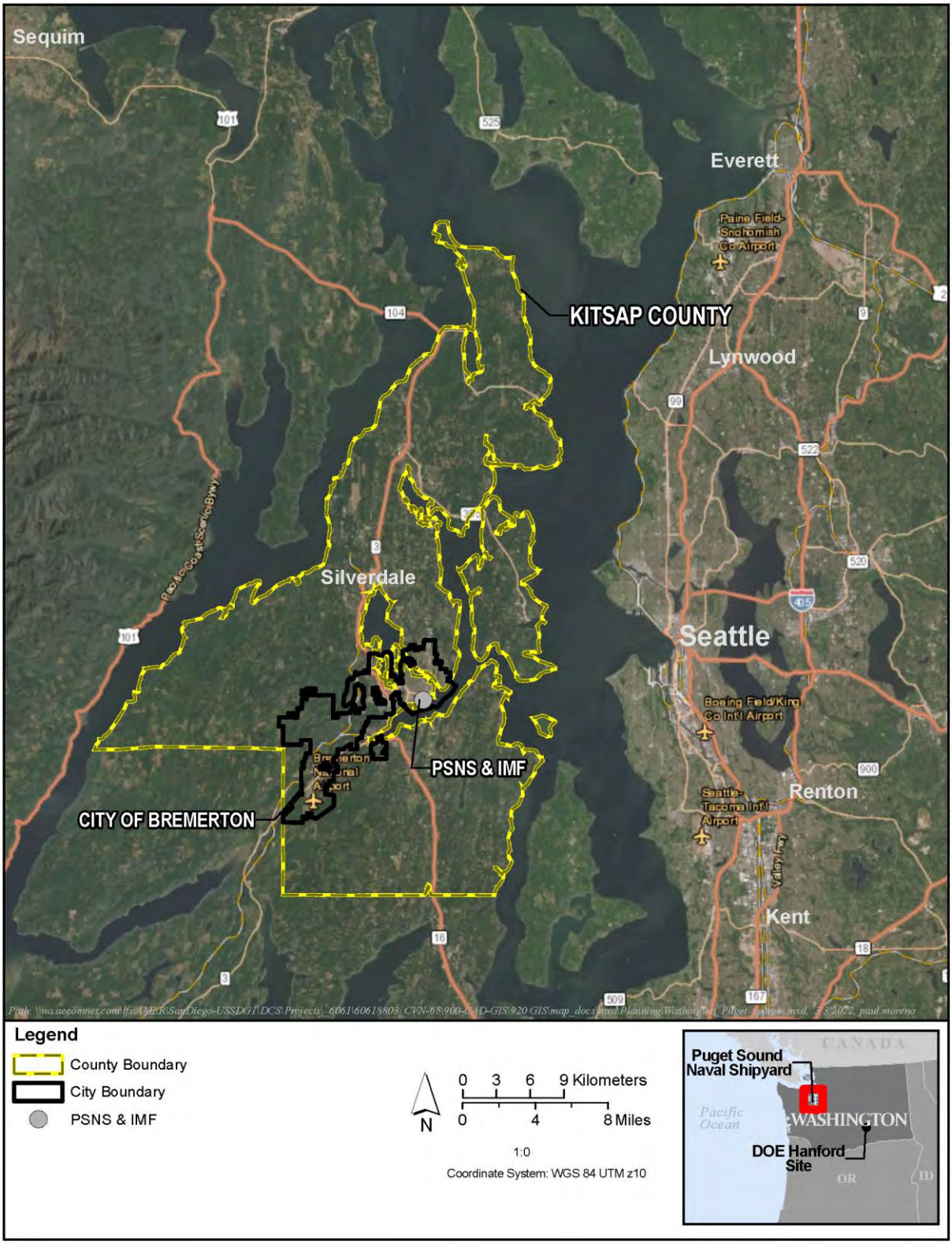


Figure 3.4-1: Washington Region of Influence – Puget Sound Naval Shipyard & Intermediate Maintenance Facility

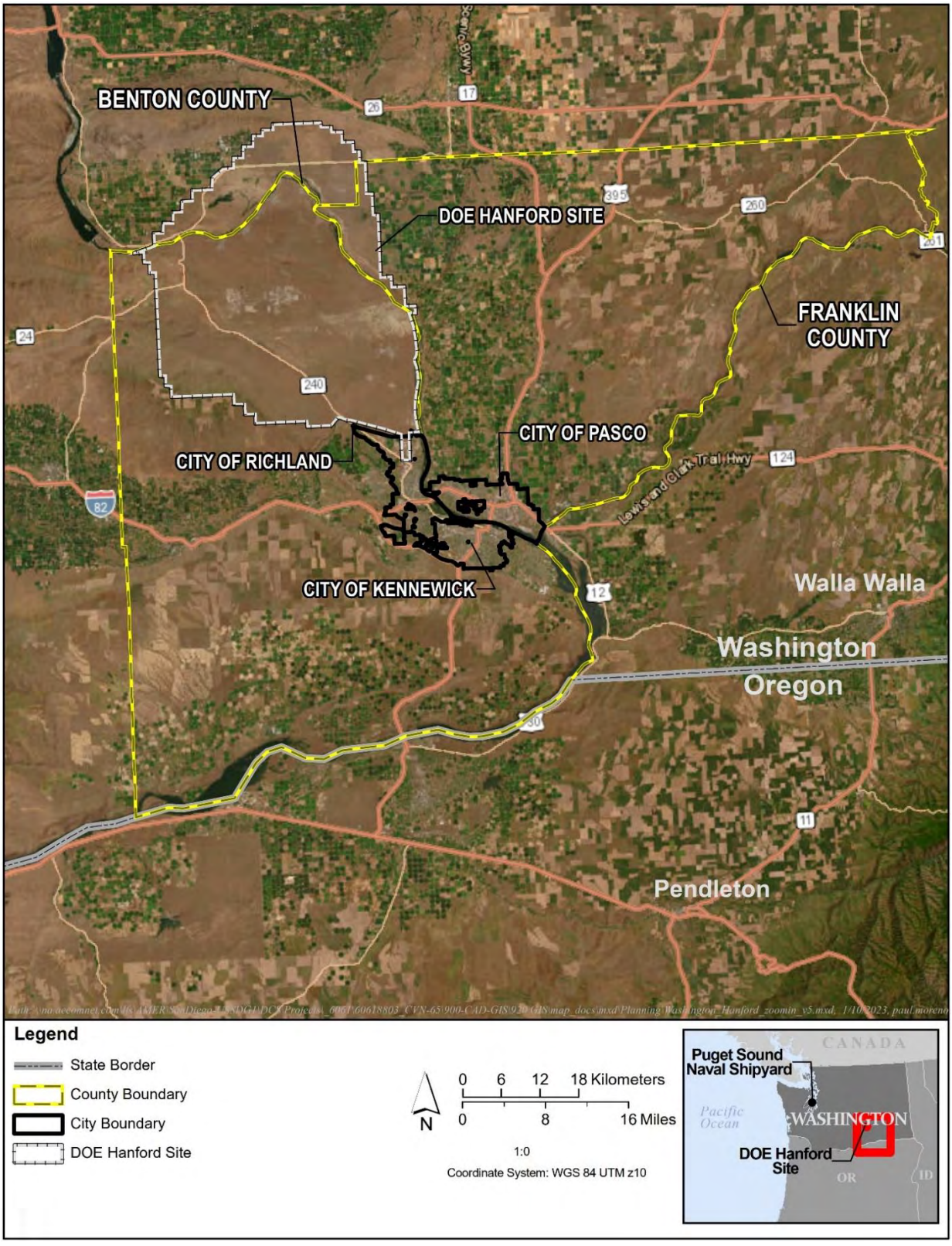


Figure 3.4-2: Washington Region of Influence – The DOE Hanford Site

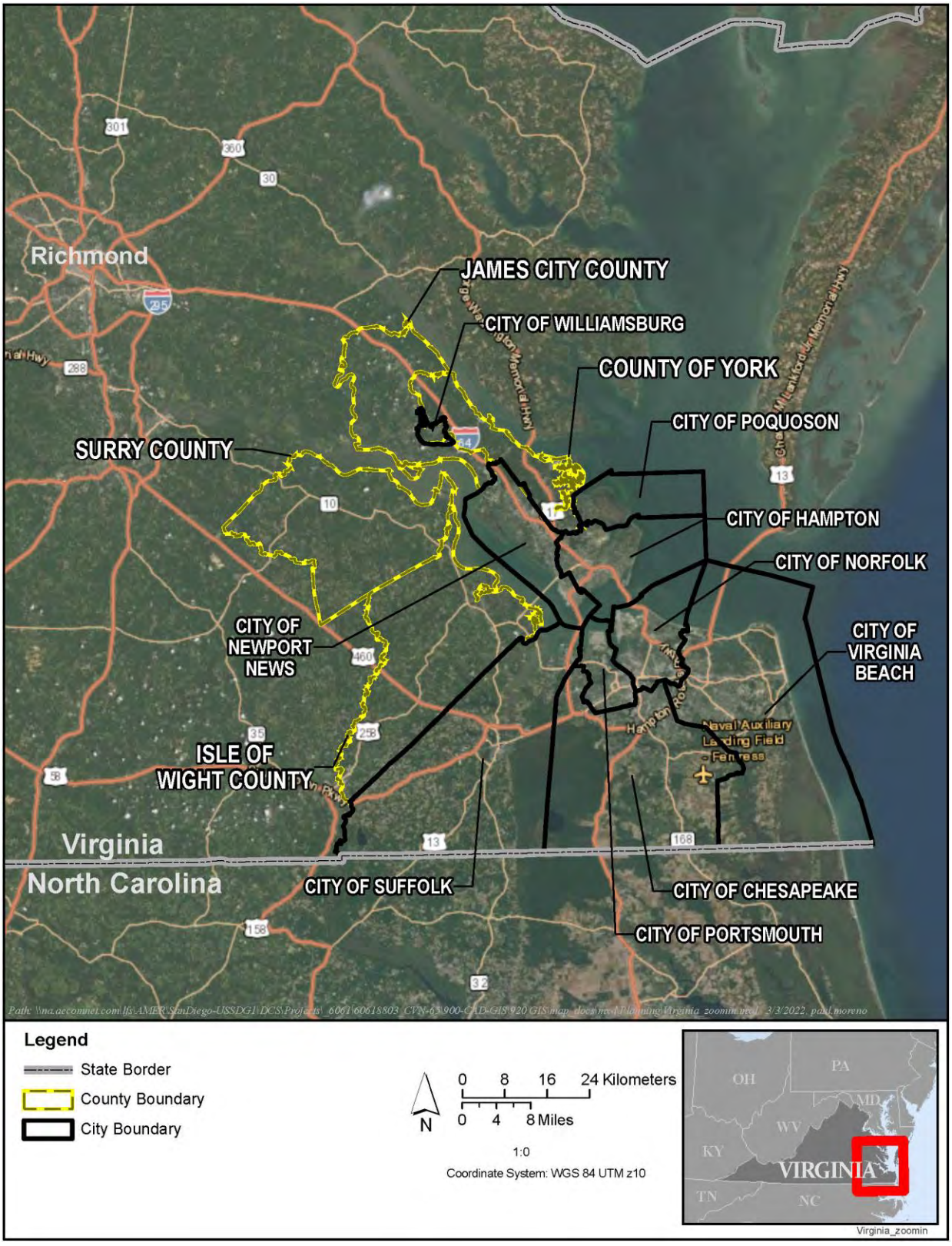


Figure 3.4-3: Virginia Region of Influence

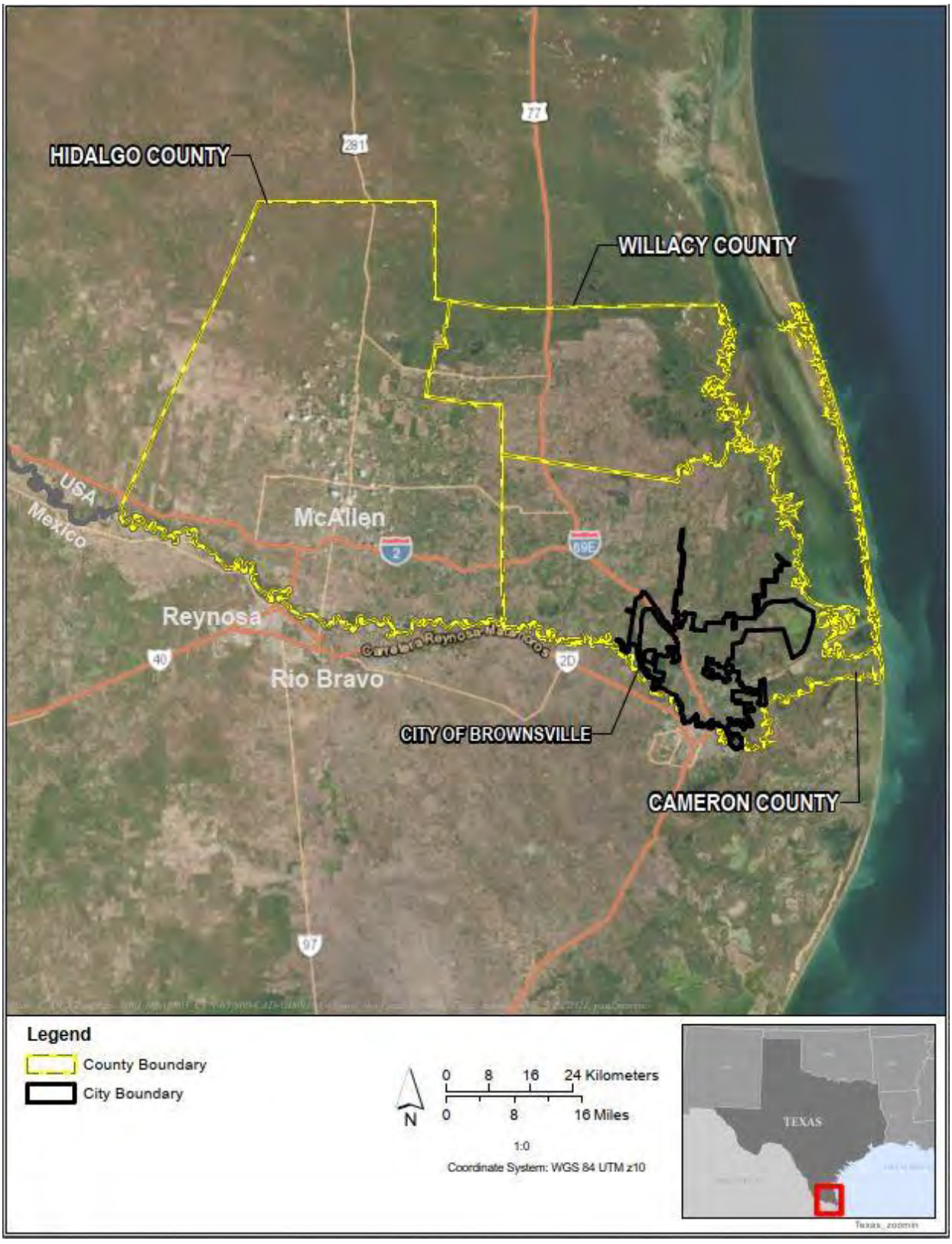


Figure 3.4-4: Texas Region of Influence



Figure 3.4-5: Alabama Region of Influence

3.4.1.2 Regulatory Framework

There are no federal or state regulations pertaining to socioeconomic impacts. Socioeconomic impacts are an element of National Environmental Policy Act documentation that must be addressed and mitigated, if warranted. No specific permits are anticipated under this discipline.

EO 13840, *Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States*, aims to improve interagency coordination for management of ocean, coastal, and Great Lakes waters to allow for productive and sustainable use of these resources. EO 13840 also aims to facilitate the economic growth of coastal communities and promote ocean industries, advance ocean science and technology, transport goods, expand recreational opportunities, harvest food, and enhance energy security. All activities associated with the dismantlement and disposal of ex-Enterprise would be consistent with this EO.

Potential impacts on community demographics and housing related to environmental justice populations are evaluated based on EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. EO 12898 requires consideration of whether the Proposed Action and alternatives would disproportionately affect minority or low-income groups. This EO requires that no minority or low-income population group should bear a disproportionate share of potential adverse environmental justice population and socioeconomic resources impacts resulting from major projects, in this case the transportation, dismantlement, and disposal of ex-Enterprise. Projects involving federal funding or approvals require an environmental justice evaluation as part of the environmental review. In addition to EO 12898, federal concerns for nondiscrimination under Title VI of the Civil Rights Act of 1964 are applicable under the environmental justice analysis. Each federal agency has developed a strategy to address environmental justice, with the Council on Environmental Quality (CEQ) responsible for oversight and coordination. The environmental justice analysis for the Proposed Action and alternatives follows the most updated versions of guidance and methodologies recommended in the CEQ Environmental Justice Guidelines under the National Environmental Policy Act.

EO 14008, *Tackling the Climate Crisis at Home and Abroad*, amends EO 12898 to establish a White House Environmental Justice Interagency Council to develop a strategy to address current and historic environmental injustice and clear performance metrics to ensure accountability, and publish an annual public performance scorecard on its implementation.

3.4.1.3 Best Management Practices

Best management practices include policies, practices, and measures that would be implemented to minimize adverse socioeconomic resources and environmental justice population impacts associated with the Proposed Action and alternatives. Procedures and policies used by the U.S. Department of the Navy (Navy) to address disproportionately high and adverse health effects have been effective in protecting minority and low-income populations. For other best management practices related to human health and safety, please refer to Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management).

3.4.1.4 Approach to Analysis

Socioeconomic data provided in this section are presented at city, county, regional, state, and national levels to characterize baseline socioeconomic conditions in the context of local, regional, state, and national trends. The baseline for identifying the socioeconomic conditions was derived using relevant published information from sources that include federal and state government agencies and databases.

Previous environmental studies were also reviewed. This data was used to identify potential impacts from the transportation, dismantlement, and disposal of ex-Enterprise on the human environment, including environmental justice populations, in the ROI described above.

In 2012, the Navy prepared the *Final Environmental Assessment on the Disposal of Decommissioned Defueled Naval Reactor Plants from USS ENTERPRISE (CVN 65)* (Navy & DOE, 2012). The approach for this EIS/OEIS takes into consideration the socioeconomic and environmental justice concerns previously expressed to the Navy as part of other actions in the aforementioned 2012 Environmental Assessment and any other concerns raised during the preparation of this EIS/OEIS.

Each of these socioeconomic resources provides data on an aspect of the human environment that involves economics (e.g., employment, income, or revenue) and social conditions (e.g., population, enjoyment and quality of life) associated with the human environment of the ROI.

The economic characteristics of the ROI are evaluated against the economic conditions of comparison geographies of the state in which the ROI is located as well as the nation. Socioeconomic changes related to direct expenditures in the local community are considered minimal if there is little or no impact on housing market (availability and value), income, employment rate, poverty rate or the population (either increases or decreases).

Environmental justice addresses low-income and minority populations by analyzing the demographic and economic characteristics of the affected area and comparing them to the characteristics of the larger geography. The U.S. Census Bureau uses a set income threshold to determine who classifies as in poverty. When total income of a family or individual is less than the threshold, the family or individual is considered to be living in poverty. Individuals who self-identify as members of the following racial/ethnic groups are considered a minority population group: Black or African American, not of Hispanic or Latino origin; American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; Hispanic or Latino of any race; and Two or More Races, as defined by the U.S. Census Bureau. For the purposes of this analysis, an ROI was determined to have a meaningful minority population if the percentage of persons identified as minority in the ROI was greater than the comparison geography (CEQ, 1997). Low-income populations in an ROI are typically defined as communities that have (1) more than 50 percent low-income persons, or (2) the percentage of persons in households below the poverty level is significantly greater than in the geographical area chosen for comparative analysis. For both minority and low-income populations, the applicable ROI and the United States were used as comparison geographies. Potential impacts of the Proposed Action and alternatives are evaluated for the potential to disproportionately impact minority and/or low-income populations. The results discussed in this section are compared to the EPA EJScreen Mapping Tool in Appendix G (Socioeconomic Analysis Comparison).

Due to the industrial nature of the existing commercial and Navy facilities, based on the analyses of census data and data on other sensitive populations—concentrations of children, elderly, disabled, female-headed households, and transit-dependent populations—impacts from activities associated with the Proposed Action were determined not to be reasonably foreseeable. Activities associated with the Proposed Action and alternatives would be conducted at existing industrial facilities or within established transportation routes, away from sensitive populations, including children. Therefore, this EIS/OEIS does not address EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, in detail.

Non-radiological dismantlement activities at a commercial dismantlement facility under all action alternatives occur within existing shipyard capabilities and would adhere to existing federal, state, and local regulations. As such, these actions are not discussed further in this analysis.

3.4.2 Affected Environment

This section describes the socioeconomic resources and environmental justice populations associated with human activities and livelihoods in the ROI that could be affected by the Proposed Action and alternatives. In Virginia and Washington, similar work already occurs at the sites evaluated, including large ship maintenance, dismantlement activities, and radiological work. In these states, ex-Enterprise work would only be a small portion of the total ship work conducted. In Texas and Alabama, there are existing ship dismantlement industries and personnel, although neither location has an existing radiological work force and may require additional personnel and regulatory oversight.

3.4.2.1 Washington

As stated in Section 3.4.1.1 (Region of Influence), the ROI for Washington includes the city of Bremerton, and Kitsap County, Washington, in which PSNS & IMF is located, as well as the cities of Richland, Kennewick, and Pasco, and Benton and Franklin counties, where the DOE Hanford Site is located.

3.4.2.1.1 Population

Table 3.4-1 provides the population, as of 2019, for the cities and counties in the Washington ROI and the comparison geographies of the state of Washington and the United States. The ROI for Washington encompasses approximately 806,817 people, which is approximately 10.9 percent of the state population.

Table 3.4-1: Population for Washington Region of Influence

Geography	Population	Growth (2010–2019)
City of Bremerton	40,631	7.7%
City of Richland	56,399	17.4%
City of Pasco	72,899	21.9%
City of Kennewick	81,479	10.2%
Kitsap County	265,882	5.9%
Benton County	197,518	12.7%
Franklin County	92,009	17.7%
Washington ROI	806,817	11.4%
Washington	7,404,107	12.8%
United States	324,697,795	6.8%

Source: U.S. Census Bureau (2019)
Note: ROI = Region of Influence

All of the cities and counties in the ROI each experienced more growth than that of the United States during this time period. The cities of Richland, Pasco, and Kennewick, and Benton and Franklin counties also experienced more growth than the state of Washington as a whole.

3.4.2.1.2 Local Economy and Low-Income Populations

The Washington ROI has a total labor force of approximately 271,749 workers. Within the Kitsap County labor force, the largest non-farm employment as of 2020 was government; this sector accounts for a

total of 33,200 jobs, 62 percent of which was federal government employment, in which a majority was civilian employees that repair, rebuild, and maintain the modern fleet of the Navy. Over 15,000 active military and approximately 20,000 federal employees continue to support the local economy of the county by their presence (Vleming, 2020). The leading industries in Kitsap County include educational services, health care, and social assistance; retail trade; professional, scientific, and management, and administrative and waste management services. One of the principal economic bases of the city of Bremerton is PSNS & IMF. Approximately 48.0 percent of jobs in the city of Bremerton were provided by government employment as of 2016 (City of Bremerton, 2016). The leading industries in city of Bremerton include educational services, health care, and social assistance; arts, entertainment, recreation, accommodation and food services; professional, scientific, and management, and administrative and waste management services. The main economic industries in the city of Richland and Benton County are professional, scientific, and management, and administrative and waste management services; health care and social assistance; and retail trade. Within Franklin County and the city of Pasco, the largest industries are educational services, health care, and social assistance; and agriculture, forestry, fishing and hunting, and mining. Educational services, health care, and social assistance; and retail trade are the largest industries in the city of Kennewick (U.S. Census Bureau, 2019). Table 3.4-2 provides data for the local economy in the Washington ROI and the comparison geographies, including median household income, employment rate, and poverty rate.

Table 3.4-2: Local Economy and Low-Income Populations for the Washington Region of Influence

Geography	Median Household Income	Employment Rate	Poverty Rate
City of Bremerton	$52,716	47.1%	16.5%
City of Richland	$77,686	61.8%	8.9%
City of Pasco	$62,775	64.1%	15.5%
City of Kennewick	$59,533	57.8%	15.5%
Kitsap County	$75,411	53.0%	8.7%
Benton County	$69,023	59.0%	11.9%
Franklin County	$63,584	61.7%	15.2%
Washington	$78,687	61.2%	10.8%
United States	$65,712	60.2%	13.4%

Source: U.S. Census Bureau (2019)

As shown in Table 3.4-2, the cities of Bremerton, Pasco, and Kennewick, and Franklin County have lower median household incomes than both comparison geographies. In contrast, Kitsap and Benton counties and the city of Richland have a median household income higher than the United States but lower than the state of Washington. The cities of Bremerton and Kennewick, Benton County, and Kitsap County have lower employment rates than the comparison geographies. The city of Pasco, Franklin County, and the city of Richland have employment rates higher than both of the comparison geographies. The city of Richland and Kitsap County have lower poverty rates than both comparison geographies, while Benton County has a lower poverty rate than the United States but a higher poverty rate than the state of Washington. The cities of Bremerton, Pasco, and Kennewick, and Franklin County have higher poverty rates than both comparison geographies.

3.4.2.1.3 Housing

Housing information for the Washington ROI and the comparison geographies is summarized in Table 3.4-3. The median property value in the cities of Pasco and Kennewick, and Franklin County, are lower than both the comparison geographies. The cities of Bremerton and Richland, and Kitsap and Benton counties, have higher median property values than the United States, but lower than the state of Washington (U.S. Census Bureau, 2019). The city of Bremerton has a lower homeownership rate than both of the comparison geographies, while the city of Kennewick has a lower homeownership rate than the United States but a higher rate than the state of Washington. The cities of Richland and Pasco, and Kitsap, Benton, and Franklin counties, have a higher homeownership rate than both of the comparison geographies (U.S. Census Bureau, 2019).

Table 3.4-3: Housing Information for Washington Region of Influence

Geography	Median Property Value	Homeownership Rate
City of Bremerton	$238,600	43.3%
City of Richland	$263,500	65.1%
City of Pasco	$199,400	69.2%
City of Kennewick	$215,500	63.3%
Kitsap County	$329,900	67.8%
Benton County	$235,800	68.8%
Franklin County	$202,400	68.5%
Washington	$339,000	63.0%
United States	$217,500	64.0%

Source: U.S. Census Bureau (2019)

3.4.2.1.4 Minority Populations

A summary of the ethnic and racial composition in the Washington ROI is presented in Table 3.4-4. As shown in the table, the city of Pasco and Franklin County have larger minority populations than the other ROI geographies, the state of Washington, and the United States. The largest minority groups in the city of Pasco and Franklin County are Hispanic or Latino and those that identify as Two or More Races, followed by Asian and Black or African American. The majority of the population in the cities of Bremerton, Richland, and Kennewick, and Kitsap and Benton counties identify as White (U.S. Census Bureau, 2019).

Table 3.4-4: Minority Populations in the Washington Region of Influence[1]

Geography	White Alone, Not Hispanic or Latino	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Hispanic or Latino of any Race	Two or More Races	Total Population
City of Bremerton	67.9%	6.2%	0.7%	5.8%	0.6%	11.1%	7.6%	40,631
City of Richland	78.0%	1.9%	0.5%	4.3%	0.0%	11.4%	3.7%	56,399
City of Pasco	38.1%	1.7%	0.3%	2.1%	0.2%	55.5%	2.1%	81,479
City of Kennewick	64.9%	1.8%	0.4%	2.4%	0.0%	26.9%	3.1%	84,347
Kitsap County	76.7%	2.6%	0.8%	4.7%	0.8%	7.8%	6.5%	265,882
Benton County	70.4%	1.4%	0.6%	2.5%	0.0%	21.7%	3.0%	197,518
Franklin County	40.4%	1.8%	0.3%	2.0%	0.2%	53.1%	2.0%	92,009
Washington	68.5%	3.7%	1.1%	8.5%	0.6%	12.7%	4.8%	7,404,107
United States	60.7%	12.3%	0.7%	5.5%	0.2%	18.0%	2.4%	324,697,759

[1]Percentages may not total 100% due to rounding.
Source: (U.S. Census Bureau, 2019)

3.4.2.2 Virginia

As stated in Section 3.4.1.1 (Region of Influence), the ROI for Virginia includes the independent cities of Newport News, Norfolk, Hampton, Virginia Beach, Chesapeake, Portsmouth, Poquoson, Suffolk, and Williamsburg, and the counties of Isle of Wight, Surry, York, and James City, collectively referred to as the Hampton Roads Metropolitan Area, Virginia.

3.4.2.2.1 Population

Table 3.4-5 provides the population, as of 2019, for the cities and counties in the Virginia ROI and the comparison geographies of the state of Virginia and the United States. The Virginia ROI contains approximately 1,647,753 people, which accounts for roughly 19.0 percent of the population of Virginia (U.S. Census Bureau, 2019).

Table 3.4-5: Population for Virginia Region of Influence

Geography	Total Population (people)	Growth (2010–2019)
City of Newport News	179,673	-1.2%
City of Norfolk	244,601	1.0%
City of Hampton	135,041	-2.9%
City of Virginia Beach	450,201	2.5%
City of Chesapeake	239,982	9.4%
City of Portsmouth	95,097	-1.7%
City of Poquoson	12,090	-0.1%
City of Suffolk	90,093	9.1%
City of Williamsburg	14,927	11.2%
Isle of Wight County	36,627	5.4%
Surry County	6,523	-7.3%
York County	67,982	4.8%
James City County	74,916	16.4%
Virginia ROI	1,647,753	3.2%
Virginia	8,454,463	7.8%
United States	324,697,795	6.8%

Source: U.S. Census Bureau (2019)
Note: ROI = Region of Influence

3.4.2.2.2 Local Economy and Low-Income Population

The Virginia ROI economy employs approximately 882,680 workers. Table 3.4-6 provides data on the local economy in the Virginia ROI and the comparison geographies, including median household income, employment rate, and poverty rate.

As shown in Table 3.4-6, the cities of Newport News, Norfolk, Hampton, Portsmouth, and Williamsburg, and Surry County have a lower median household income than the comparison geographies, while the city of Suffolk and Isle of Wight County have higher median household incomes than the United States but lower than the state of Virginia. The cities of Chesapeake, Virginia Beach, and Poquoson, and York and James City counties have higher median household incomes than both comparison geographies. All geographies within the Virginia ROI have a lower employment rate than the comparison geographies, with the exception of the city of Virginia Beach, which has the same employment rate as the state. The cities of Chesapeake, Portsmouth, Poquoson, and Suffolk, and Isle of Wright, Surry, York, and James City counties have lower poverty rates than both comparison geographies; while the cities of Newport News, Norfolk, Hampton, Virginia Beach, and Williamsburg, and Surry County have higher poverty rates than the comparison geographies.

Table 3.4-6: Local Economy and Low-Income Population for the Virginia Region of Influence

Geography	Median Household Income	Employment Rate	Poverty Rate
City of Newport News	$53,215	57.4%	15.3%
City of Norfolk	$51,590	52.2%	18.7%
City of Hampton	$56,287	56.5%	15.2%
City of Chesapeake	$78,640	59.0%	7.3%
City of Portsmouth	$52,175	55.2%	8.6%
City of Virginia Beach	$76,610	61.5%	16.8%
City of Poquoson	$97,118	58.5%	5.6%
City of Suffolk	$74,884	60.1%	10.4%
City of Williamsburg	$57,463	47.1%	20.7%
Isle of Wight County	$73,991	59.4%	10.5%
Surry County	$57,962	57.2%	15.9%
York County	$92,069	56.9%	4.9%
James City County	$87,678	55.0%	7.3%
Virginia	$76,456	61.5%	10.6%
United States	$65,712	60.2%	13.4%

Source: U.S. Census Bureau (2019)

The largest industries in Hampton are educational services, health care, and social assistance; retail trade; and arts, entertainment, recreation, accommodation, and food service (U.S. Census Bureau, 2019).

The local economy in the city of Chesapeake focuses on five target industries: logistics and supply chain management; defense and security technologies; advanced manufacturing; professional business services; and healthcare (Sperling's Best Places, 2020). The city of Chesapeake employs 111,227 workers.

The largest industries in the city of Portsmouth include educational services, health care, and social assistance; retail trade; and manufacturing. The city of Portsmouth's overall economy employs 41,396 workers (U.S. Census Bureau, 2019).

The city of Virginia Beach economy employs 221,998 workers. The largest industries are educational services, health care, and social assistance; professional, scientific, and management, and administrative and waste management services; and retail trade (U.S. Census Bureau, 2019).

The city of Suffolk economy employs 42,459 workers. The largest industries are educational services, health care, and social assistance; manufacturing; professional, scientific, and management, and administrative and waste management services; and retail trade (U.S. Census Bureau, 2019).

The economy employs 6,394 people in the city of Williamsburg. The largest industries are educational services, health care, and social assistance; and arts, entertainment, recreation, accommodation and food services (U.S. Census Bureau, 2019).

The Isle of Wight County economy employs 17,799 workers. Isle of Wight County has a large industry focus in educational services, health care, and social assistance; manufacturing; and professional,

scientific, and management, and administrative and waste management services (U.S. Census Bureau, 2019).

Surry County is the smallest county in the Virginia ROI. The largest industries are educational services, health care, and social assistance; manufacturing; and retail trade. The Surry County economy employs 3,151 workers (U.S. Census Bureau, 2019).

The York County economy employs 30,556 workers (U.S. Census Bureau, 2019). The largest industries in York County are educational services, health care, and social assistance; professional, scientific, and management, and administrative and waste management services; and public administration.

James City County economy employs 33,950 workers. The largest industries in James City County are educational services, health care, and social assistance; arts, entertainment, recreation, and accommodation and food services; and professional, scientific, and management, and administrative and waste management services (U.S. Census Bureau, 2019).

3.4.2.2.3 Housing

Table 3.4-7 provides housing information for the Virginia ROI and the comparison geographies of the state of Virginia and the United States, including median property value and homeownership rate. The cities of Newport News, Norfolk, Hampton, and Portsmouth, and Surry County have lower median property values than the comparison geographies, while the cities of Chesapeake, Virginia Beach, Poquoson, and Williamsburg have higher median property values than the comparison geographies. The city of Suffolk and Isle of Wright, York, and James City counties have higher median property values than the United States but lower median property values than the state of Virginia. The cities of Newport News, Norfolk, Hampton, Portsmouth, Virginia Beach, and Williamsburg have lower homeownership rates than both comparison geographies; while the cities of Chesapeake, Poquoson, and Suffolk, and Isle of Wright, Surry, York, and James City counties, have higher homeownership rates than the comparison geographies (U.S. Census Bureau, 2019).

Table 3.4-7: Housing Information for Virginia Region of Influence

Geography	Median Property Value	Homeownership Rate
City of Newport News	$194,000	48.9%
City of Norfolk	$206,700	43.4%
City of Hampton	$186,700	55.7%
City of Chesapeake	$273,700	71.4%
City of Portsmouth	$170,900	55.0%
City of Virginia Beach	$280,800	63.7%
City of Poquoson	$323,100	81.4%
City of Suffolk	$254,400	68.7%
City of Williamsburg	$306,000	49.3%
Isle of Wight County	$266,800	75.8%
Surry County	$197,800	74.3%
York County	$327,100	71.3%
James City County	$340,500	76.4%
Virginia	$273,100	66.3%
United States	$217,500	64.0%

Source: U.S. Census Bureau (2019)

3.4.2.2.4 Minority Populations

The ethnic and racial composition of the population of the Virginia ROI is summarized in Table 3.4-8. Within the Virginia ROI, the cities of Newport News, Norfolk, Hampton, Portsmouth and Suffolk, and Surry County all have greater minority populations than the comparison geographies. The cities of Virginia Beach, Chesapeake, Poquoson, and Williamsburg, and Isle of Wight, York, and James City counties are predominately White. Black or African American is the dominant minority population in the Virginia ROI, followed by Hispanic or Latino of Any Race (U.S. Census Bureau, 2019).

Table 3.4-8: Minority Populations in the Virginia Region of Influence[1]

Geography	White Alone, Not Hispanic or Latino	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Hispanic or Latino of any Race	Two or More Races	Total Population
City of Newport News	42.9%	40.0%	0.2%	3.2%	0.2%	9.0%	4.1%	179,673
City of Norfolk	43.4%	40.5%	0.3%	3.5%	0.0%	8.0%	3.9%	244,601
City of Hampton	38.2%	49.2%	0.4%	2.4%	0.1%	5.8%	3.6%	135,041
City of Virginia Beach	61.7%	18.4%	0.2%	6.6%	0.1%	8.2%	4.6%	450,201
City of Chesapeake	57.4%	29.3%	0.1%	3.1%	0.1%	6.2%	3.6%	239,982
City of Portsmouth	37.7%	52.2%	0.4%	1.4%	0.3%	4.5%	3.3%	95,097
City of Poquoson	91.4%	1.1%	0.1%	2.5%	0.0%	2.8%	2.1%	12,090
City of Suffolk	49.3%	41.0%	0.2%	1.9%	0.0%	4.4%	3.1%	90,093
City of Williamsburg	67.7%	15.0%	0.3%	6.5%	0.0%	7.1%	3.1%	14,927
Isle of Wight County	70.7%	22.2%	0.4%	0.9%	0.1%	3.1%	2.8%	36,627
Surry County	52.6%	44.4%	0.0%	0.2%	0.0%	0.6%	2.0%	6,523
York County	70.7%	12.8%	0.2%	5.5%	0.2%	6.4%	3.6%	67,982
James City County	75.6%	12.9%	0.1%	2.4%	0.0%	5.8%	2.9%	74,916
Virginia	61.8%	18.8%	0.2%	6.3%	0.1%	9.4%	3.1%	8,454,463
United States	60.7%	12.3%	0.7%	5.5%	0.2%	18.0%	2.4%	324,697,759

[1]Percentages may not total 100% due to rounding.
Source: U.S. Census Bureau (2019)

3.4.2.3 Texas

As stated in Section 3.4.1.1 (Region of Influence), the ROI in Texas includes the city of Brownsville, and Cameron, Hidalgo, and Willacy counties.

3.4.2.3.1 Population

Table 3.4-9 provides the population, as of 2019, for the cities and counties in the Texas ROI and the comparison geographies of the state of Texas and the United States. The Texas ROI contains over 1,480,701 people and approximately 5.0 percent of the total Texas population (U.S. Census Bureau, 2019).

Table 3.4-9: Population for Texas Region of Influence

Geography	Population	Growth (2010–2019)
City of Brownsville	182,271	7.5%
Cameron County	421,666	7.1%
Hidalgo County	855,176	16.0%
Willacy County	21,588	-0.8%
Texas ROI	1,480,701	6.9%
Texas	28,260,856	12.0%
United States	324,697,795	6.8%

Source: U.S. Census Bureau (2019)
Note: ROI = Region of Influence

3.4.2.3.2 Local Economy and Low-Income Population

The local economy in the Texas ROI employs approximately 532,905 people. The largest industries in the city of Brownsville and Cameron County are educational services, health care, and social assistance; retail trade; and arts, entertainment, recreation, and accommodation and food services. In Willacy County, the largest industries are educational services, health care, and social assistance; agriculture, forestry, fishing and hunting, and mining; and retail trade. Hidalgo County has the largest government force compared to the other geographies with approximately 56,000 workers. The largest industries are educational services, health care, and social assistance; retail trade; and arts, entertainment, recreation, and accommodation and food services (U.S. Census Bureau, 2019).

Table 3.4-10 provides data about the local economy in the Texas ROI and the comparison geographies. All of the geographies within the Texas ROI have lower median household incomes and employment rates than the comparison geographies. The poverty rate in the city of Brownsville, and Cameron and Hidalgo counties, are higher than the comparison geographies. The poverty rate in Willacy County is higher than the United States but lower than the state of Texas.

Table 3.4-10: Local Economy and Low-Income Population for the Texas Region of Influence

Geography	Median Household Income	Employment Rate	Poverty Rate
City of Brownsville	$38,588	52.9%	29.3%
Cameron County	$38,758	52.5%	28.9%
Hidalgo County	$40,014	54.3%	29.7%
Willacy County	$35,521	45.3%	27.0%
Texas	$64,034	61.7%	28.7%
United States	$65,712	60.2%	14.7%

Source: U.S. Census Bureau (2019)

3.4.2.3.3 Housing

Table 3.4-11 provides the median property values and homeownership rates for the Texas ROI and comparison geographies. All four geographies in the Texas ROI have lower median property values than the comparison geographies. Willacy, Cameron, and Hidalgo counties have higher homeownership rates than the comparison geographies, whereas the city of Brownsville has a lower homeownership rate than the comparison geographies (U.S. Census Bureau, 2019).

Table 3.4-11: Housing Information for Texas Region of Influence

Geography	Median Property Value	Homeownership Rate
City of Brownsville	$90,000	60.7%
Cameron County	$85,800	65.9%
Hidalgo County	$87,100	68.0%
Willacy County	$55,300	70.5%
Texas	$172,500	62.0%
United States	$217,500	64.0%

Source: U.S. Census Bureau (2019)

3.4.2.3.4 Minority Populations

The ethnic and racial composition of the Texas ROI and comparison geographies is shown in Table 3.4-12. As shown, Hispanic or Latino was the most prevalent ethnicity in the Texas ROI. The geographies within the Texas ROI have a substantially higher minority population than the comparison geographies, which are predominantly White (U.S. Census Bureau, 2019).

Table 3.4-12: Minority Populations in the Texas Region of Influence[1]

Geography	White Alone, Not Hispanic or Latino	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Hispanic or Latino of any Race	Two or More Races	Population
City of Brownsville	4.9%	0.4%	0.1%	0.6%	0.0%	94.0%	0.1%	182,271
Cameron County	8.9%	0.4%	0.1%	0.7%	0.0%	89.7%	0.2%	421,666
Hidalgo County	6.1%	0.4%	0.1%	0.9%	0.0%	92.2%	0.1%	855,176
Willacy County	11.2%	0.6%	0.0%	0.0%	0.0%	88.2%	0.0%	21,588
Texas	42.0%	11.8%	0.3%	4.7%	0.1%	39.3%	1.7%	28,260,856
United States	60.7%	12.3%	0.7%	5.5%	0.2%	18.0%	2.4%	324,697,759

[1]Percentages may not total 100% due to rounding.
Source: U.S. Census Bureau (2019)

3.4.2.4 Alabama

As stated in Section 3.4.1.1 (Region of Influence), the ROI in Alabama includes the city of Mobile, and Baldwin and Mobile counties.

3.4.2.4.1 Population

Table 3.4-13 provides the population, as of 2019, for the cities and counties in the Alabama ROI and the comparison geographies of the state of Alabama and the United States. The Alabama ROI contains approximately 817,376 people, which is approximately 16.8 percent of the total Alabama population.

Table 3.4-13: Population for Alabama Region of Influence

Geography	Population	Growth (2010–2019)
City of Mobile	190,432	-2.7%
Baldwin County	212,830	21.1%
Mobile County	414,114	1.3%
Alabama ROI	817,376	4.8%
Alabama	4,876,250	3.5%
United States	324,697,795	6.8%

Source: U.S. Census Bureau (2019)
Note: ROI = Region of Influence

3.4.2.4.2 Local Economy and Low-Income Population

The Alabama ROI has a labor force of approximately 285,592 workers. Within the manufacturing industry in the Mobile region, ship and boat building accounted for 25.0 percent of total manufacturing employment in 2019 with roughly 19,191 workers (Mobile Area Chamber of Commerce, 2019). The leading industries in the city of Mobile and Baldwin County are educational services, health care, and social assistance; retail trade; and arts, entertainment, recreation, and accommodation and food services. The leading industries in Mobile County are educational services, health care, and social assistance; manufacturing; and retail trade. Local economy data for the Alabama ROI and the comparison geographies are provided in Table 3.4-14, including median household income, employment rate, and poverty rate.

Table 3.4-14: Local Economy and Low-Income Population for the Alabama Region of Influence

Geography	Median Household Income	Employment Rate	Poverty Rate
City of Mobile	$42,321	53.7%	20.7%
Baldwin County	$58,320	55.2%	10.4%
Mobile County	$47,583	53.3%	18.8%
Alabama	$51,734	54.7%	16.7%
United States	$65,712	60.2%	13.4%

Source: U.S. Census Bureau (2019)

The median household incomes and employment rates in the city of Mobile and Mobile County are lower than comparison geographies. The median household income and employment rates in Baldwin County are higher than the state of Alabama, but lower than the United States. The city of Mobile and Mobile County have higher poverty rates than both the comparison geographies, whereas Baldwin County has a lower poverty rate than both the comparison geographies.

3.4.2.4.3 Housing

Table 3.4-15 presents housing data for the Alabama ROI and comparison geographies. Median property values are lower in the city of Mobile and Mobile County than comparison geographies. Baldwin County has a higher median property value than Alabama but lower than the United States. The homeownership rate in the city of Mobile is less than both comparison geographies, while the homeownership rate in Mobile County is higher than the United States but lower than the state of

Alabama. The homeownership rate in Baldwin County is higher than the comparison geographies (U.S. Census Bureau, 2019).

Table 3.4-15: Housing Information for Alabama Region of Influence

Geography	Median Property Value	Homeownership Rate
City of Mobile	$123,600	53.2%
Baldwin County	$197,900	75.2%
Mobile County	$130,200	64.5%
Alabama	$142,700	68.8%
United States	$217,500	64.0%

Source: U.S. Census Bureau (2019)

3.4.2.4.4 Minority Populations

A summary of the ethnic and racial composition in the Alabama ROI is presented in Table 3.4-16. The city of Mobile has a higher minority population than the comparison geographies. The majority of the population in Baldwin and Mobile counties identifies as White, with Baldwin County having a substantially higher White population than Mobile County and the comparison geographies. The largest minority group in the Alabama ROI is Black or African American, followed by Hispanic or Latino (U.S. Census Bureau, 2019).

Table 3.4-16: Minority Populations in the Alabama Region of Influence[1]

Geography	White Alone, Not Hispanic or Latino	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Hispanic or Latino of any Race	Two or More Races	Total Population
City of Mobile	41.8%	51.4%	0.2%	1.9%	0.0%	2.5%	1.9%	190,432
Baldwin County	83.1%	9.2%	0.7%	0.9%	0.0%	4.6%	1.5%	212,830
Mobile County	56.9%	35.5%	0.8%	1.9%	0.0%	2.9%	1.6%	414,114
Alabama	65.5%	26.5%	0.5%	1.3%	0.0%	4.3%	1.7%	4,876,250
United States	60.7%	12.3%	0.7%	5.5%	0.2%	18.0%	2.4%	324,697,759

[1]Percentages may not total 100% due to rounding.
Source: U.S. Census Bureau (2019)

3.4.3 Environmental Consequences

The analysis of impacts on socioeconomic resources and environmental justice populations is focused on the effects of the Proposed Action and alternatives on housing market, employment, population, minority populations, and income levels. The alternatives were evaluated based on the potential for and the degree to which the dismantlement activities could impact socioeconomic resources and environmental justice populations.

3.4.3.1 No Action Alternative

3.4.3.1.1 Ex-Enterprise Is Stored in Newport News, Virginia

As described in Section 2.3.1 (No Action Alternative), under the No Action Alternative, ex-Enterprise would be maintained in waterborne storage at Newport News Shipbuilding. The No Action Alternative would require some maintenance and inspection to ensure it is being stored in an environmentally safe

manner. These activities would be in alignment with typical shipyard activities and would result in negligible effects above baseline conditions at the storage facility. In addition, the No Action Alternative would not meet the need to dismantle and dispose of ex-Enterprise and would not require federal funds to be spent on activities associated with dismantling or disposing of ex-Enterprise. Long-term storage of ex-Enterprise under the No Action Alternative is not likely to measurably improve or impact the socioeconomic and environmental justice condition of the Virginia ROI. Table 2-2 in Chapter 2 (Description of Proposed Action and Alternatives) provides more information outlining the cost of the No Action Alternative.

Work for the No Action Alternative would be minimal in comparison to typical activities performed at Newport News Shipbuilding. There are in-water hull inspections for hull integrity, and all preservation availabilities (e.g., paint, corrosion protection) have already been performed in dry dock. No Action Alternative work is typical work for Newport News Shipbuilding and is performed in accordance with all federal, local, and state regulations. Therefore, maintenance and storage of ex-Enterprise under the No Action Alternative is not likely to measurably improve or impact the human, economic, or environmental condition of the ROI, and no disproportionate impacts are anticipated on environmental justice populations as a result of the No Action Alternative.

3.4.3.2 Alternative 1: Single Reactor Compartment Packages

As stated in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages) and Section 3.4.1.4 (Approach to Analysis) above, partial dismantlement of ex-Enterprise at a commercial dismantlement facility is not analyzed in this section.

3.4.3.2.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

As described in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages), ex-Enterprise would be towed from its current storage location to a commercial dismantlement facility at one of three locations for partial dismantlement: Virginia, Texas, or Alabama. Impacts associated with towing operations would be minimized as a result of adherence to best management practices, including compliance with the *Navy Towing Manual SI740-AA-MAM-010*, Rev 3, July 2002. As discussed in Section 3.5 (Biological Resources), water quality impacts in relation to in-water hull cleaning in the Hampton Roads Metropolitan Area, Virginia have the potential to have some impacts but are reduced through project designs, implementation of current or proposed management practices and mitigation. Similar to the Proposed Action, the water quality impacts from towing ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility, are considered to be minimal with the implementation of project design and implementation of best management practices associated with these activities. Section 1.5 (Scope of Environmental Analysis) further identifies that several key documents for dismantlement and disposal of nuclear powered ships have identified minimal impacts on water quality given compliance with applicable federal, state, and local environmental laws and regulations. Additionally, towing operations would occur in open ocean or rivers, which would not come in contact with low-income or minority populations, impact the local economy or housing market, or result in a change in population in the ROI. Therefore, no impacts on socioeconomic resources or disproportionate impact on environmental justice populations in relation to water quality would occur.

3.4.3.2.2 Transport Waste and Recyclable Material from Commercial Dismantlement Facility to an Approved Waste Disposal or Recycling Facility

As described in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages), waste and recyclable material would be transported from the commercial dismantlement facility to an approved

waste disposal or recycling facility. Transportation of wastes would adhere to applicable federal, state, and local regulations. Additional information is provided in Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management) on the health and safety regulations. The workers required to transport the waste and recyclable materials from the commercial dismantlement facility already exist in the ROI; therefore, an increase in population would not occur as a result of this action. In turn, there would not be a strain on the existing housing market in the area. This action would have a minor overall benefit to the local economy as it would provide additional work for the existing workforce. Although minority and low-income populations exist in the Virginia, Texas, and Alabama ROIs, adherence to applicable regulations and use of existing transport systems would result in minimal impacts on all populations, as discussed in Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management). Therefore, there would not be a disproportionate impact on environmental justice populations, and impacts on socioeconomic resources would be minimal.

3.4.3.2.3 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

As described in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages), the remaining propulsion space section would be transported to PSNS & IMF via propulsion space section heavy-lift ship via established shipping lanes around the southern tip of South America and then up the west coast and into the Strait of Juan de Fuca and ultimately into PSNS & IMF (see Figure 2-5). Standard shipping operations detailed in Chapter 2 (Description of Proposed Action and Alternatives) would avoid contact with environmental justice populations, would not cause an increase or decrease in population or housing market, and would not impact the local economy. Therefore, there would not be a disproportionate impact on environmental justice populations, and impacts on socioeconomic resources would be minimal.

3.4.3.2.4 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages (No In-Water Work)

Once relocated to PSNS & IMF, work detailed in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages) would occur consistent with established practices and requirements. Pier-side work at PSNS & IMF is not anticipated to generate impacts on the general populations or environmental justice populations. This work would be conducted by the existing local workforce and would not result in changes to the local population or housing market. The local economy may see a small benefit as a result of the work at PSNS & IMF. Therefore, impacts on socioeconomic resources associated with pier-side work at PSNS & IMF would be minimal. There would be no disproportionate impacts on environmental justice populations.

As described in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages), eight single reactor compartment packages would be prepared at PSNS & IMF for disposal in Trench 94 at the DOE Hanford Site. All work would comply with all applicable federal, state, and local regulations and would not be accessible by the general public. As discussed in Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management), impacts on human and environmental health and safety as a result of this work would be minimal. Thus, potential impacts on the surrounding population are anticipated to be minimal. Significant changes in workforce at PSNS & IMF due to dismantlement of the propulsion space section and construction of ex-Enterprise and its reactor compartments are not expected as the work would occur within the fixed capacity of the

shipyard given other ongoing repair work. Any change in workforce would be consistent with expected attrition through retirement and resignation, balanced by normal make-up hiring (Navy & DOE, 2012).

As no change in workforce is anticipated, there would be no change in the housing market or local economy. Preparation of eight single reactor compartment packages at PSNS & IMF is not anticipated to generate impacts on the general populations or environmental justice populations. This work would be conducted by the existing local workforce and would not result in changes to the local population or housing market. The local economy may see a small benefit as a result of the work at PSNS & IMF. Therefore, impacts on socioeconomic resources associated this work would be minimal. There would be no disproportionate impacts on environmental justice populations.

3.4.3.2.5 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

As described in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages), additional rail structures would be added within Trench 94 at the DOE Hanford Site to support the reactor compartment packages, requiring limited excavation of the trench floor.

Trench 94 at the DOE Hanford Site is in an isolated area about 7 miles from the Columbia River and contains various cruiser and submarine reactor compartment packages. The installation of the rail system for reactor compartment packages is within an existing facility, away from the general public and environmental justice populations, and would be conducted in accordance with existing federal, state, and local regulations. Installation of the rail system would be conducted by the existing workforce in the Washington ROI and therefore would not impact population or housing market. Economic benefits to the area would be nominal. Therefore, there would be no disproportionate impacts on environmental justice populations, and impacts on socioeconomic resources would be minimal.

3.4.3.2.6 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

Alternative 1 would involve transportation of the reactor compartment packages from PSNS & IMF by water to the Port of Benton barge slip. The waterborne transport route for the reactor compartment packages from PSNS & IMF would follow normal shipping lanes through Puget Sound and south along the Washington coast to the mouth of the Columbia River. The route then goes up the Columbia River, following the shipping channel used for the regular transport of commercial cargo. The river route passes through the Washington ROI to the barge slip located in north Richland, Washington (Navy & DOE, 1996). The use of normal shipping lanes would keep the reactor compartment packages away from the general population as well as environmental justice populations. Transport of the reactor compartment packages would be conducted by the existing workforce and therefore would not change the population or housing market in the Washington ROI, and economic benefits would be nominal. Therefore, there would be no disproportionate impacts on environmental justice populations, and impacts on socioeconomic resources would be minimal.

3.4.3.2.7 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at Department of Energy Hanford Site

Reactor compartment packages would be transported from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site via multiple wheel high-capacity transporters using the same process used for the current program (Navy & DOE, 2012). Transport arrangements would be made for the safety of other drivers and would be scheduled on a weekend to avoid heavy use of the roadway. Travel would be restricted to one side of the four-lane highway, or pilot cars could be used to provide safe escort around

the package on the southbound lane for bypass. Furthermore, land transportation would be conducted in accordance with applicable Nuclear Regulatory Commission, Department of Transportation, and DOE orders and procedures regarding transportation security and safety. Transport of the reactor compartment packages would be conducted by the existing workforce and therefore would not change the population or housing market in the Washington ROI, and economic benefits would be nominal. Adherence to best management practices and regulations would reduce potential impacts on the general population and environmental justice populations. Therefore, there would be no disproportionate impacts on environmental justice populations, and impacts on socioeconomic resources would be minimal.

3.4.3.3 Alternative 2: Dual Reactor Compartment Packages

As stated in Section 2.3.3 (Alternative 2 – Dual Reactor Compartment Packages) and Section 3.4.1.4 (Approach to Analysis) above, partial dismantlement of ex-Enterprise at a commercial dismantlement facility is not analyzed in this section.

3.4.3.3.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

Under Alternative 2, tow activities would be the same as under Alternative 1, as described and analyzed in Section 3.4.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility). Therefore, no impacts on socioeconomic resources or disproportionate impacts on environmental justice populations would occur.

3.4.3.3.2 Transport Waste and Recyclable Material from Commercial Dismantlement Facility to an Approved Waste Disposal or Recycling Facility

Similar to Alternative 1, transportation of waste and recyclable material from partial dismantlement under Alternative 2 would be the same as described and analyzed for Alternative 1 in Section 3.4.3.2.2 (Transport Waste and Recyclable Material from Commercial Dismantlement Facility to an Approved Waste Disposal or Recycling Facility). Therefore, there would be no disproportionate impacts on environmental justice populations, and impacts on socioeconomic resources would be minimal.

3.4.3.3.3 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

Under Alternative 2, activities associated with the shipment of ex-Enterprise via propulsion space section heavy-lift ship from one of the commercial dismantlement locations to PSNS & IMF would be the same as analyzed for Alternative 1 in Section 3.4.3.2.3 (Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility [Following Route Around South America]). Therefore, there would be no disproportionate impacts on environmental justice populations, and impacts on socioeconomic resources would be minimal.

3.4.3.3.4 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Four Dual Reactor Compartment Packages (No In-Water Work)

Pier-side and dry dock work under Alternative 2 would be similar to Alternative 1 in Section 3.4.3.2.4 (Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages [No In-Water Work]). Under Alternative 2, the four conjoined pairs of reactor compartments would not be separated, which would result in the construction and transport of four dual reactor compartment packages. These four dual reactor compartment packages would be larger

and heavier than the eight single reactor compartment packages of Alternative 1. The larger and heavier packages would require approximately five years in dry dock (a reduction of one to three years compared to Alternative 1). However, this work would be in alignment with similar work already performed at PSNS & IMF. All work would comply with all applicable federal, state, and local regulations and would not be accessible by the general public. As discussed in Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management), impacts on human and environmental health and safety as a result of this work would be minimal. Thus, potential impacts on the surrounding population are anticipated to be minimal. Significant changes in workforce at PSNS & IMF due to dismantlement of the propulsion space section and construction of ex-Enterprise and its reactor compartments are not expected as the work would occur within the fixed capacity of the shipyard given other ongoing repair work. Any change in workforce would be consistent with expected attrition through retirement and resignation, balanced by normal make-up hiring (Navy & DOE, 2012).

As no change in workforce is anticipated, there would be no change in the housing market or local economy. Preparation of four dual reactor compartment packages (at PSNS & IMF) is not anticipated to generate impacts on the general populations or environmental justice populations. This work would be conducted by the existing local workforce and would not result in changes to the local population or housing market. The local economy may see a small benefit as a result of the work at PSNS & IMF. The construction of four dual reactor compartment packages (at PSNS & IMF) is anticipated to result in minimal impacts on socioeconomic resources and would not result in disproportionate impacts on environmental justice populations.

3.4.3.3.5 Port of Benton Barge Slip Modifications

Modifications to the Port of Benton barge slip would involve excavation to allow for the widening of the barge slip (in-water work) and inland pile driving and concrete work. As discussed in Section 3.5 (Biological Resources), water quality impacts in relation to the barge slip modification activities have the potential to have some impacts but are reduced through project designs, implementation of current or proposed management practices, and mitigation. Similar to the Proposed Action, the barge slip modifications water quality impacts are considered to be minimal with the implementation of project design and implementation of best management practices associated with these activities. Section 1.5 (Scope of Environmental Analysis) further identifies that several key documents for dismantlement and disposal of nuclear-powered ships have identified minimal impacts on water quality given compliance with applicable federal, state, and local environmental laws and regulations. Construction of the infrastructure modifications at the barge slip site would result in temporary work and could be accomplished by the existing workforce. Labor resources for barge slip modifications would be insignificant compared to the typical scale of civil construction for a city of this population. The dismantlement and disposal of ex-Enterprise would not permanently change the local population, economy, or housing market within the communities surrounding the barge slip. All work associated with the barge slip modifications would be conducted in accordance with applicable federal, state, and local regulations and best management practices. The work would also be conducted away from the general public. As such, impacts on the local community are anticipated to be minimal. Therefore, impacts associated with the barge slip modifications on socioeconomic resources are anticipated to be minimal, and no disproportionate impacts on environmental justice populations in relation to water quality would occur.

3.4.3.3.6 Road Improvements Between Port of Benton Barge Slip and Trench 94 at Department of Energy Hanford Site

Due to the size and weight of the dual reactor compartment packages, Alternative 2 would require infrastructure improvements to the transport route at the DOE Hanford Site in the form of re-grading portions of the transport route. Road improvements between the Port of Benton barge slip and Trench 94 at the DOE Hanford Site would be designed and constructed in accordance with the geotechnical report for the Proposed Action and applicable building and grading codes, and would follow best management practices set forth in Section 2.3.3 (Alternative 2 – Dual Reactor Compartment Packages). These best management practices are anticipated to minimize impacts on both people and the environment. As such, these road improvements are not anticipated to have impacts on the surrounding community. Further, all infrastructure upgrades are anticipated to be completed by the existing workforce in the Washington ROI, and therefore would not change the local population or housing market, but may have a nominal benefit on the economy. Therefore, impacts on socioeconomic resources are anticipated to be minimal, and no disproportionate impacts on environmental justice populations are anticipated to occur.

3.4.3.3.7 Install Rail System for Reactor Compartment Packages in Trench 94 at Department of Energy Hanford Site

Under Alternative 2, activities associated with the installation of a rail system in Trench 94 at the DOE Hanford Site would be the same as under Alternative 1, as described and analyzed in Section 3.4.3.2.5 (Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site). Therefore, there would be no disproportionate impacts on environmental justice populations, and impacts on socioeconomic resources would be minimal.

3.4.3.3.8 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

Under Alternative 2, activities associated with the barge transport of reactor compartment packages would be the same as under Alternative 1, as described and analyzed in Section 3.4.3.2.6 (Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip). Therefore, there would be no disproportionate impacts on environmental justice populations, and impacts on socioeconomic resources would be minimal.

3.4.3.3.9 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at Department of Energy Hanford Site

Under Alternative 2, activities associated with the land transport of reactor compartment packages would be the same as under Alternative 1, as described and analyzed in Section 3.4.3.2.7 (Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at Department of Energy Hanford Site). Therefore, there would be no disproportionate impacts on environmental justice populations, and impacts on socioeconomic resources would be minimal.

3.4.3.4 Alternative 3 (Preferred Alternative): Commercial Dismantlement

3.4.3.4.1 Tow ex-Enterprise from Newport News, Virginia to Commercial Dismantlement Facility

Under Alternative 3 (Preferred Alternative), tow activities would be the same as under Alternative 1, as described and analyzed in Section 3.4.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility). Towing operations would occur in open ocean or rivers, which

would not come in contact with low-income and minority populations, and would not impact the local population, economy, or housing market. Therefore, no impacts on socioeconomic resources or disproportionate impacts on environmental justice populations would occur.

3.4.3.4.2 Complete Dismantlement of ex-Enterprise at Commercial Dismantlement Facility (Includes In-Water Work)

Once at the commercial dismantlement facility, the selected contractor would dispose of ex-Enterprise. Non-radiological work activities would be within the normal capabilities of the contractor. Radiological work activities would be performed by trained radiological service workers at the commercial dismantlement facility. This work could require the addition of radiological workers to the typical workforce in some locations. The Navy estimates that approximately 94 additional workers with experience in radiological dismantlement and disposal may be temporarily relocated to the commercial dismantlement facility in the Virginia, Texas, or Alabama ROIs to dismantle ex-Enterprise for approximately three to five years. While there is an established radiological services industry in Virginia, this analysis was based on the conservative assumption all radiological service workers would need to be added to the workforce as there is no way to quantify what number of workers used are from the Virginia ROI or another region. Compared to the overall population in each ROI, this increase in the number of workers would result in a less than 0.01 percent increase in the total population of the ROI. Thus, impacts on the population and housing markets would be negligible. The complete dismantlement of ex-Enterprise at a commercial dismantlement facility would indirectly have a small benefit to the local economy, through the temporary increase of approximately 94 workers to the Virginia, Texas, or Alabama ROI for a period of three to five years. The personnel involved in the dismantlement and disposal of ex-Enterprise would contribute to the local economy by increased workforce spending, which generates local business revenues and supports additional wages, sales, and taxes for the state, county, and local municipalities. The contribution to the local economy with the added workforce would be minor because the majority of the work would be conducted under current circumstances and with the existing workforce, with only a small increase in new, temporary workers to the Virginia, Texas, or Alabama ROI. Overall, impacts on socioeconomic resources would be minimal.

As shown in Sections 3.4.2.2 (Virginia), 3.4.2.3 (Texas), and 3.4.2.4 (Alabama), minority and low-income populations exist in the ROIs for Virginia, Texas, and Alabama; thus, environmental justice populations are considered present in the ROIs. Activities associated with the complete dismantlement of ex-Enterprise would take place in existing industrial complexes, away from the general public and environmental justice populations. All dismantlement activities would be conducted in compliance with applicable federal, state, and local laws and regulations. Aircraft carrier dismantling contracts include a clause that requires the contractor to comply with all applicable federal, state, and local environmental and occupational safety and health laws and regulations. The commercial dismantlement facilities already conduct similar activities; therefore, potential impacts on the surrounding communities are not anticipated to change.

Although there are environmental justice populations in the Alternative 3 (Preferred Alternative) ROIs, impacts associated with the dismantlement and disposal of ex-Enterprise are anticipated to be minimal, with risks consistent with industrial work currently ongoing in those areas. Therefore, no disproportionate impacts on environmental justice populations would occur.

3.4.3.4.3 Transport Waste and Recyclable Materials from Commercial Dismantlement Facility to an Approved Waste Disposal or Recycling Facility

As described in Section 2.3.4 (Alternative 3 [Preferred Alternative] – Commercial Dismantlement), waste and recyclable materials generated from the dismantlement of ex-Enterprise at the commercial dismantlement facility would be transported to an approved waste disposal or recycling facility. Waste transportation would be conducted in accordance with applicable regulations. As noted in Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management), impacts on human and environmental health and safety would be minimal. As such, there would be no disproportionate impacts on environmental justice populations.

Transportation of waste and recyclable materials would be conducted by the existing workforce in the ROI; therefore, no changes to the existing population or the housing market would occur, and benefits to the local economy would be nominal. Therefore, impacts on socioeconomic resources would be minimal.

3.4.3.4.4 Low-Level Radioactive Waste Disposal at Appropriate Approved Disposal Facilities

As discussed in Section 2.3.4 (Alternative 3 [Preferred Alternative] – Commercial Dismantlement), Section 3.1 (Public and Occupational Health and Safety), and Section 3.2 (Hazardous and Radioactive Waste Management), waste from ex-Enterprise would be disposed of at approved disposal facilities. Low-level radioactive waste would be disposed of at the existing DOE or commercial waste facilities in Texas, Utah, or South Carolina. As concluded in Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management), impacts on human and environmental health and safety would be minimal. Therefore, no disproportionate impacts on environmental justice populations would occur. Additionally, disposal would be conducted by the existing workforce at the disposal facility; therefore, no changes to the local population or housing market would occur, and negligible benefits to the local economy may occur. Thus, impacts on socioeconomic resources would be minimal.

3.4.4 Mitigation

All activities would comply with all applicable federal, state, and local environmental and occupational safety and health laws and regulations. If reasonably foreseeable impacts are determined to result, mitigation measures beyond best management practices would be developed and implemented. No mitigation measures are required under any of the alternatives, including the No Action Alternative, because no major impacts are reasonably foreseeable.

3.4.5 Summary of Impacts and Conclusions

Table 3.4-17 summarizes the impacts of the alternatives on socioeconomic resources and environmental justice resources.

Table 3.4-17: Summary of Impacts and Conclusions on Socioeconomic Resources and Environmental Justice Populations

Potential Impacts on Socioeconomic Resources	Alternatives			
	No Action	1	2	3
Impacts from transportation of ex-Enterprise		o	o	o
Impacts from dismantlement of ex-Enterprise		o	o	o
Impacts from disposal of ex-Enterprise		o	o	o
Potential Impacts on Environmental Justice Populations	**Alternatives**			
	No Action	**1**	**2**	**3**
Impacts from transportation of ex-Enterprise				
Impacts from dismantlement of ex-Enterprise				
Impacts from disposal of ex-Enterprise				

Note: o = minimal impact, Blank = no impact/not applicable

3.5 Biological Resources

This section of the Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) describes biological resources, which consist of native and non-native plant and animal species and the habitats in which they occur, and results of analysis of environmental impacts associated with the Proposed Action and alternatives. Both resident and migratory biological resources associated with the Regions of Influence (ROI) are analyzed in this section. Section 3.5.1 (Methodology) defines the ROI and applicable regulatory framework for an assessment of potential impacts on biological resources. Section 3.5.2 (Affected Environment) describes the biological resources within the ROI and is followed by Section 3.5.3 (Environmental Consequences), which includes the analysis of potential impacts on biological resources under each alternative. Section 3.5.4 (Mitigation) describes actions undertaken by the United States (U.S.) Department of the Navy (Navy) to avoid, minimize, or mitigate impacts.

3.5.1 Methodology

3.5.1.1 Region of Influence

The ROI for biological resources includes the following elements:

- areas within port, shipyard, and commercial facilities that may support waterborne storage or dismantlement of ex-Enterprise
- potential tow routes for ex-Enterprise from the current mooring location at Newport News Shipbuilding, Virginia
- routes that may be used by a heavy-lift ship from a partial dismantlement location to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF)
- the immediate vicinity and surrounding habitats of the Port of Benton barge slip in Richland, Washington, that may be subject to infrastructure improvements
- land transportation routes that may be subject to infrastructure improvements between the Port of Benton barge slip and the Department of Energy (DOE) Hanford Site
- transportation routes to other potential waste facilities from locations analyzed for dismantlement activities.

3.5.1.2 Regulatory Framework

The Navy has identified a number of laws and regulations relevant to the Proposed Action and alternatives and potential impacts on biological resources. These frameworks and appropriate agency consultations are summarized below.

3.5.1.2.1 Endangered Species Act

The federal Endangered Species Act (ESA) (16 United States Code [U.S.C.] Sections 1531–1544) protects federally listed threatened and endangered plant and animal species. Species considered to be threatened include species that are likely to become endangered. Endangered is a listing classification for plant and animal species in danger of extinction throughout all or a major portion of their ranges.

The ESA authorizes the determination and listing of species as endangered and threatened and provides regulatory protection for listed species. Each federal agency, in consultation with and with the assistance of the Secretary of the Interior pursuant to section 7(a)(2) of the ESA, is required to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse

modification of critical habitat of such species. Federal agencies are to use the best scientific and commercial data available in meeting these requirements.

In the analysis for potential effects to ESA-listed species from the Proposed Action and alternatives, the Navy has presented effects of the action using definitions specified in the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) publication *Endangered Species Act Consultation Handbook: Procedures for Conducting Consultations and Conferences* (USFWS & NMFS, 1998). Terms used in the effects analysis are defined in 50 Code of Federal Regulations Part 402.17. Effects of the action are all consequences to listed species or critical habitat that are caused by the Proposed Action and alternatives, including the consequences of other activities that are caused by the Proposed Action and alternatives. "May affect" with respect to a species is the appropriate conclusion when an ESA-listed species might be exposed to a reasonably foreseeable consequence of the Proposed Action and alternatives and could respond to that exposure. For critical habitat, "may affect" is the appropriate conclusion if an essential physical or biological feature may be exposed. Discountable effects are those extremely unlikely to occur. Insignificant effects relate to the size of the impact and should never reach the scale where an adverse effect would occur. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects.

As stated in Section 2.3 (Alternatives Carried Forward for Analysis), the Navy has identified Alternative 3 as the preferred alternative. Section 2.3.4 (Alternative 3 [Preferred Alternative] – Commercial Dismantlement) describes the Navy's preferred alternative and analyzes potential impacts on biological resources in Section 3.5.3.4 (Alternative 3 [Preferred Alternative]: Commercial Dismantlement). The Navy has consulted with both NMFS and USFWS pursuant to section 7(a)(2) of the ESA for Alternative 3 (Preferred Alternative). Accordingly, conclusions of potential effects on ESA-listed species are presented in the Alternative 3 (Preferred Alternative) analysis. Agency documentation is provided in Appendix D (Consultation Correspondence).

3.5.1.2.2 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) of 1972 prohibits, with certain exceptions, the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the United States.

The MMPA defines take as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal." The MMPA further defines harassment by classifying levels of harassment—Level A and Level B harassment (16 U.S.C. Section 1362). Level A harassment occurs when "an action injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild." Level B harassment occurs when "an action disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behavioral patterns are abandoned or significantly altered." However, the MMPA allows, upon request, the incidental take of small numbers of marine mammals by U.S. citizens who engage in a specified activity, other than commercial fishing, within a specified geographic region.

Because of the extremely low likelihood of activities described in this EIS/OEIS to exceed thresholds required for consultation with NMFS under the MMPA, potential impacts on marine mammals in the context of the MMPA are not analyzed in detail in this section, and consultation with NMFS under the MMPA is not required.

3.5.1.2.3 Migratory Bird Treaty Act

Over 1,000 species of birds are protected in the United States under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. Sections 703–712; Ch. 128; 13 July 1918; 40 Stat. 755 as amended (USFWS, 2020b). A migratory bird is any species or family of birds that live or reproduce in or migrate across international borders at some point during their annual life cycle. The MBTA established federal responsibilities for the protection of nearly all species of birds, eggs, and nests (Maroun, 2018).

In 2006, the USFWS and U.S. Department of Defense (DoD) signed a Memorandum of Understanding (MOU) to promote conservation of migratory birds (USFWS, 2020b). The conservation of migratory bird populations by federal agencies is mandated by Executive Order (EO) 13186 (Federal Register [FR], August 30, 2006), *Responsibilities of Federal Agencies to Protect Migratory Birds*. In April 2007, further guidance was issued by the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and DoD in accordance with EO 13186. This guidance covers all DoD-sponsored actions, including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups.

Although military readiness activities are exempt from take provisions specified in the MBTA (as allowed under the 2003 National Defense Authorization Act), the Navy has determined that the Proposed Action and alternatives would not qualify as a military readiness activity defined in the 2014 DoD and USFWS MOU to promote the conservation of migratory birds (DoD & USFWS, 2014). The 2014 MOU does not address incidental take resulting from military readiness activities or active DoD airfield operations.

Recent administrative actions and court decisions are modifying the scope of the MBTA and the Department of Interior (DOI) mandate to enforce and administer the MBTA. In December 2017, the DOI issued its Solicitor's Opinion, which clarified that otherwise lawful activity that results in an incidental take of a protected bird does not violate the MBTA (DOI, 2017). In February 2018, the Deputy Assistant Secretary of Defense memo clarified that DoD actions should continue current practices to minimize take of migratory birds (DoD, 2018). On January 7, 2021, there was a final ruling on the scope of the MBTA which raised concerns from the public and international treaty partners, as well as created legal challenges. On October 4, 2021, the final MBTA revocation of the January 7, 2021 ruling was published in the FR. The final MBTA revocation was effective December 3, 2021.

The Proposed Action would primarily take place in already developed sites. In the case of the Port of Benton barge slip modifications (Section 3.5.3.3.4 [Port of Benton Barge Slip Modifications]), the vast majority of the work is projected to take place outside the nesting time (beginning of April through mid-August). Additionally, the Port of Benton is also highly developed, with nearly all the vegetation already removed, and no nesting has been observed nearby. Because of the extremely low likelihood of activities described in this EIS/OEIS exceeding thresholds required for consultation with USFWS under the MBTA, potential impacts on migratory birds in the context of the MBTA are not analyzed in detail in this section.

3.5.1.2.4 Bald and Golden Eagle Protection Act

Bald and golden eagles are migratory birds that are protected under the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. Section 668) in addition to the MBTA. The BGEPA states that no one, without a permit issued by the Secretary of the Interior, may take bald or golden eagles, including their parts, nests, or eggs. The BGEPA defines take as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." The BGEPA further defines disturbance as "to agitate or bother a bald

or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (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." As part of the literature review, the Navy has included bald and golden eagle nest locations and occurrences in project area descriptions in Section 3.5.2 (Affected Environment) and analyzed these locations for potential impacts in Section 3.5.3 (Environmental Consequences). The Navy identified two locations where bald eagles may be in proximity to activities described in this EIS/OEIS—PSNS & IMF and the Port of Benton barge slip, both in Washington state.

3.5.1.2.5 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act is the principal law governing marine fisheries in the United States. Federal agencies must consult with NMFS when their actions or activities may adversely affect habitat identified by federal regional fishery management councils or NMFS as Essential Fish Habitat (EFH). Congress defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. Section 1802[10]). Through consultations, NMFS may recommend ways federal agencies can avoid or minimize the adverse effects of their actions on the habitat of federally managed commercial and recreational fisheries.

Potential impacts of the Navy's Proposed Action and alternatives on EFH and federally managed fish species are summarized in Section 3.5.3 (Environmental Consequences). The Navy has identified in-water hull cleaning at the current ex-Enterprise mooring location and construction activities associated with the Port of Benton barge slip modification as the only activities that warrant consultation with NMFS for potential impacts on EFH. Potential impacts on EFH are discussed under the impacts assessment for in-water hull cleaning under all alternatives and for construction activities at the barge slip under Alternative 2. The Navy has consulted with NMFS pursuant to the Magnuson-Stevens Fishery Conservation and Management Act for Alternative 3 (Preferred Alternative). Accordingly, conclusions of potential effects on EFH are presented in the Alternative 3 (Preferred Alternative) analysis. Agency documentation is provided in Appendix D (Consultation Correspondence).

3.5.1.2.6 Executive Orders for Invasive Species – Executive Order 13112 and 13751

In 1999, EO 13112 (*Invasive Species*) called upon the DoD and other federal departments and agencies to take steps to prevent the introduction and spread of invasive species, and to support efforts to eradicate and control invasive species that are established. In 2016, EO 13751 (*Safeguarding the Nation from the Impacts of Invasive Species*) amended EO 13112 and directed actions to continue coordinated federal prevention and control efforts related to invasive species. This order incorporated considerations of human and environmental health, climate change, technological innovation, and other emerging priorities into federal efforts to address invasive species. Towing of inactive Navy ships has the potential to transport potentially invasive species between origin ports and destination ports (NMFS, 2019). Accordingly, the Navy would implement hull cleaning of ex-Enterprise as a mitigation measure at the current mooring location of ex-Enterprise (Newport News Shipbuilding, Virginia) to reduce the potential for transportation and introduction of potentially invasive species at towing destinations outside of the Hampton Roads Metropolitan Area. These locations include the shipyard facilities at the Port of Mobile, Alabama, or the Port of Brownsville, Texas. The potential to introduce invasive species during construction of the Port of Benton barge slip modifications and road improvements as part of Alternative 2 would be minimized by the best management practices described in Section 3.5.1.3 (Best Management Practices) to clean equipment before entering and leaving the job site.

3.5.1.3 Best Management Practices

This section addresses standard operating procedures and other measures that are part of existing agreements and permit requirements that minimize or avoid potential impacts on biological resources. Best management practices identified for towing and dismantlement of ex-Enterprise are sourced from terms and conditions of the 2019 NMFS Programmatic Biological Opinion entitled the *Programmatic Biological and Conference Opinion on the Towing of Inactive U.S. Navy Ships from their Existing Berths to Dismantling Facilities or other Inactive Ship Site* (NMFS, 2019). Other sources include Chief of Naval Operations Instruction 5090.1E, Naval Ships' Technical Manual (NSTM) guidance for hull maintenance, Integrated Natural Resources Management Plans (INRMP) that include best management practices at PSNS & IMF, Washington (Navy, 2016, 2018a), and planning documents produced by the DOE Richland Operations Office (DOE, 2017b, 2018a). The Navy identified several best management practices for the towing of inactive Navy ships. Applicable measures are summarized below:

- **Reduce the potential for nonindigenous species transport and establishment at destination ports**. In the 2019 NMFS Programmatic Biological Opinion, the Navy committed to implement mitigation measures to reduce the potential for species attached to an inactive ship's hull to be transported and introduced to areas outside of their natural range, and subsequently become established in the new location and potentially impact ESA-listed resources. The Navy plans to consult with NMFS and USFWS to assess potential effects on ESA-listed species from tow route scenarios under Alternative 3 (Preferred Alternative) that were not analyzed in the 2019 NMFS Programmatic Biological Opinion, and the Navy intends to commit to implement the same mitigation measures agreed to in the 2019 NMFS Programmatic Biological Opinion for reducing the risk of transporting non-indigenous biofouling species between origination and destination ports.
- **Ballast-water from inactive Navy ship operations**. Ballast water is required for towing inactive ships for list, trim, and stability purposes. When inactive ships are towed for transfer purposes to ports consisting of inactive fleet sites, ballast water would not be removed when the ship arrives at the destination port. Prior to towing the ship, ballast water may be added, transferred between tanks, or removed. If any ballast water is removed, it would be sent offsite for treatment and disposal in accordance with all federal, state, and local laws and regulations. For inactive ships being towed for dismantlement, ballast water would be removed as part of the dismantlement process and is under the cognizance of the Navy contractor. As part of the dismantling process, the contractor would pump the ballast water ashore and send it for treatment and disposal in accordance with all federal, state, and local laws and regulations.
- **Reduce potential adverse effects of hull cleaning at origin ports**. In the 2019 NMFS Programmatic Biological Opinion, the Navy committed to use hull cleaning methods that minimize adverse effects on ESA-listed species found at the origination port. In-water hull maintenance of ex-Enterprise while stored at the current mooring location would be in accordance with the *Maintenance Manual for Inactive Nuclear Powered Ships and Nuclear Support Shops and Service Craft* (Navy, 1995). The Navy would conduct in-water hull cleaning during seasonal work windows to the maximum extent practicable. This avoidance and minimization measure is designed to minimize the potential impacts on ESA-listed species described in Section 3.5.2.1 (Virginia). In accordance with Uniform National Discharge Standards (85 FR 43465), the Navy would first give consideration to one of the dry docking mitigation measures. Dry docking would be the first method considered, though this method would only be

implemented if there is a sufficiently sized dry dock available during the required timeframe that is in close enough proximity to the origination port to preclude risk of invasive species transfer. In cases where the Navy determines dry docking is not practicable, the Navy would perform in-water hull cleaning using underwater hull cleaning methods and equipment as specified in NSTM chapter-081, "Waterborne Underwater Hull Cleaning of Navy Ships" (Navy, 2006). This manual provides a description of the various tools, such as diver-operated machines with rotating brushes, either multi-brush or single-brush fitted with different brush types depending on the machine and fouling conditions present. Additional detail on this measure is provided in Section 3.5.3 (Environmental Consequences) under discussions of in-water hull cleaning.

- **Reduce the potential of ship and tow line strike**. Navy ships operate in accordance with the navigation rules established by the U.S. Coast Guard. All ships operating on the water are required to follow the International Navigation Rules (Commandant Instruction M16672.2D). Navigation rules are formalized in the *Convention on the International Regulations for Preventing Collisions at Sea, 1972*. Applicable navigation requirements include, but are not limited to Rule 5 (Lookouts) and Rule 6 (Safe Speed):
    - Rule 5 requires that ships at all times maintain a proper lookout by all available means appropriate to the prevailing circumstances and conditions to be alert for collision risks. The commercial tow vessel operator will ensure that the tug maintain a lookout at all times to minimize the risk of collision ((NMFS, 2023)). In addition, during the proposed tow of the ex-Enterprise, a Navy escort vessel with at least one Marine Species Awareness Training-trained lookout would accompany the commercial tow vessel ((NMFS, 2023)).
    - Rule 6 requires that ships at all times proceed at a safe speed so that proper and effective action can be taken to avoid collision and so they can be stopped within a distance appropriate to the prevailing circumstances and conditions. During transit, the tug and tow would typically travel at speeds less than 10 knots in the open ocean. Speed would be reduced while in port areas ((NMFS, 2023)).

Best management practices applicable to the modifications to the Port of Benton barge slip are summarized below:

- **Project area in-water work window**. Seasonal restrictions on in-water construction within the Columbia River through the northern portion of the Lake of Wallula, which includes the Port of Benton barge slip, are in place to minimize potential impacts on upstream and downstream migrating salmonids. The Navy would use the most current version of the in-water work window for barge slip modifications at the Port of Benton. In 2020, NMFS issued a biological opinion for U.S. Army Corps of Engineers (USACE) and Bureau of Reclamation activities related to the continued operation and management of the Columbia River system (USACE, 2020). This document includes in-water work windows for routine scheduled maintenance (planned maintenance performed at regular intervals) and non-routine maintenance (maintenance that is planned but is not performed at regular intervals, such as unit overhauls, major structural modifications, or rehabilitations). In-water construction associated with modifications to the Port of Benton barge slip would be analogous to non-routine maintenance. Based on provisions in the NMFS 2020 biological opinion, if the Navy selects an alternative that includes modifications to the Port of Benton barge slip, the Navy anticipates that the in-water work window would occur between December 15 and February 28. The final work window for any in-water activities associated with modifications to the Port of Benton

barge slip would be determined during consultation with NMFS and USFWS, and in conformance with applicable Washington Administrative Code (WAC) provisions for minimizing impacts on salmonid migrations.

- **Construction sequence and methods**. Section 3.5.3.3.4 (Port of Benton Barge Slip Modifications) provides a detailed discussion of construction activities. As standard practice, sheet piles would be placed on land with a vibratory hammer. Sheet piles would be placed before the removal of the jetty to reduce the pressure wave, which would reduce the amount of sound entering the Columbia River channel.
- **Spill Prevention and Response**. Construction contracts would have environmental protection provisions included in scoping and contracting documents. These measures include provisions prohibiting release of substances defined as a dangerous or hazardous waste, or regulated substances defined by federal, state, and local laws and regulations. Fueling and lubrication of equipment and motor vehicles would occur primarily off site.
- **Turbidity fencing**. Turbidity fences would be used to confine all turbidity within the in-water construction area for the barge slip modifications.

Best management practices applicable to land transport route upgrades include:

- **Avoidance of undisturbed habitats adjacent to the land transport route**. Contractors would be required to keep vehicles and heavy machinery within the non-vegetated road prism. If laydown areas are required, they must be identified prior to the start of work and included in the ecological compliance review.
- **Minimizing introduction of invasive species**. Contractors would be required to use vehicle and equipment cleaning stations to minimize the introduction and spread of weeds during construction by cleaning vehicles and equipment prior to entering and as soon as possible after leaving each work area.
- **Revegetation of disturbed ground**. For any ground disturbance required for the land transport route between the Port of Benton barge slip and Trench 94 at the DOE Hanford Site (see Section 3.5.3.3.5 [Road Modifications Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site]), revegetation of disturbed ground is included in the management of biological resources in accordance with the *Hanford Site Biological Resources Management Plan* (BRMP) (DOE, 2017b). The BRMP establishes biological resource values and priorities relative to the mitigation of impacts to vegetative species and habitats. The BRMP prescribes compensatory mitigation replacement ratios based on resource levels (Levels 0-5) and the size of the area affected. The *Hanford Site Revegetation Manual* guides revegetation efforts under the BRMP by providing general specifications for the design, timing, scheduling, plant and seed selection, and implementation of various types of revegetation actions ((DOE, 2020)).

3.5.1.4 Approach to Analysis

Figure 3.5-1 illustrates the steps the Navy followed in support of this EIS/OEIS to identify biological resources potentially impacted by the Proposed Action and alternatives, how each alternative may impact biological resources, what those impacts would be under each alternative, and measures that offset potential impacts. These steps are summarized below.

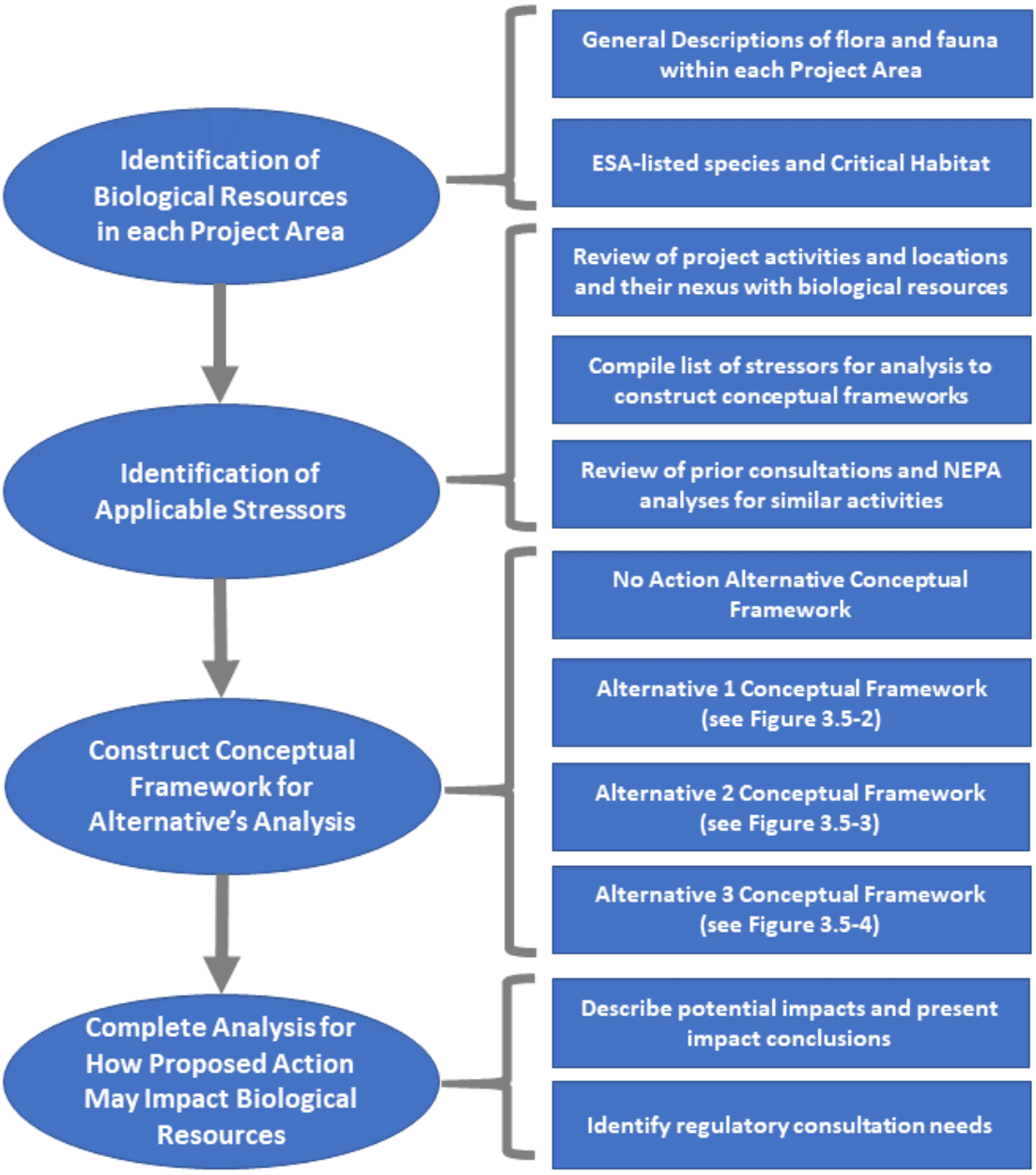


Figure 3.5-1: Step-Wise Approach to Analysis for Biological Resources

3.5.1.4.1 Identification of Biological Resources in Each Project Area

The Navy conducted a literature review to accurately describe biological resources potentially impacted by the Proposed Action and alternatives. In general, the biological resources identified were primarily freshwater and marine species and habitats, with consideration of species and habitats occurring on land where impacts may potentially occur. Information was sourced from available documentation relevant to each port location, transit route, and waste facility described in Section 2.1 (Proposed Action). Sources of information include National Environmental Policy Act (NEPA) documentation, INRMPs (relevant only to DoD-owned and managed properties) and other natural resource management plans, section 7 ESA consultation documentation from consultations between the Navy (and other federal agencies) and NMFS or USFWS, lists of species compiled by federal and state agencies, technical surveys for flora and fauna specific to potentially impacted areas, and other literature available through academic research institutions. These descriptions are included in Section 3.5.2 (Affected Environment).

3.5.1.4.2 Identification of Endangered Species Act-Listed Species and Critical Habitat Designations Potentially Impacted by the Proposed Action

Table 3.5-1 provides a list of all ESA-listed species and their designated critical habitats that are known to occur or may potentially occur at specific project areas described in Section 3.5.2 (Affected Environment). ESA-listed species that likely occur along transportation routes (such as the tow routes proposed for ex-Enterprise to dismantlement ports, heavy-lift ship routes for propulsion space section transport, and the barge route from PSNS & IMF to the Port of Benton barge slip) are listed in Appendix H (ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes). Accordingly, the Navy has consulted with USFWS and NMFS for species under their jurisdictions if the preferred alternative includes activities that may affect species at these locations. Some of the species with federal ESA-listing status identified in Appendix H (ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes), Table H-1, are also afforded protections under individual states laws and authorities. Agency documentation is provided in Appendix D (Consultation Correspondence). The impact analyses for these species and protective measures included in consultations with NMFS or USFWS are applicable to these species.

Table 3.5-1: Threatened and Endangered Species and Their Designated Critical Habitat at Project Facilities

Common Name (*Scientific Name*)[1,2]	**Federal Status[3]**	**Species Listing Final Rule (Published Date/Effective Date)**	**Critical Habitat Final Rule (Published Date/Effective Date)**	**Designated Critical Habitat at the Project Facility**
PSNS & IMF, WASHINGTON[4]				
Chinook salmon Puget Sound ESU (*Oncorhynchus tshawytscha*)	T	64 FR 14308 (24 March 1999/ 24 May 1999)	70 FR 52629 (2 September 2005/ 2 January 2006)	**No.** PSNS & IMF site excluded from Chinook salmon critical habitat.
Steelhead Puget Sound DPS (*Oncorhynchus mykiss*)	T	72 FR 26722 (11 May 2007/ 11 June 2007)	81 FR 9251 (24 February 2016/ 25 March 2016)	**No**. Critical habitat has not been designated in the vicinity of PSNS & IMF.
Bull trout Coastal-Puget Sound DPS (*Salvelinus confluentus*)	T	64 FR 58910 (1 November 1999/ 1 December 1999)	75 FR 63898 (18 October 2010/ 17 November 2010)	**No.** Critical habitat has not been designated in the vicinity of PSNS & IMF.
Bocaccio Puget Sound/Georgia Basin DPS (*Sebastes paucispinis*)	E	75 FR 22276 (28 April 2010/ 27 July 2010)	79 FR 68041 (13 November 2014/ 11 February 2015)	**No**. Critical habitat for rockfish has not been designated in the vicinity of PSNS & IMF.
Yelloweye rockfish Puget Sound/Georgia Basin DPS (*Sebastes ruberrimus*)	T	75 FR 22276 (28 April 2010/ 27 July 2010)	79 FR 68041 (13 November 2014/ 11 February 2015)	
Killer whale Southern Resident DPS (*Orcinus orca*)	E	70 FR 69903 (18 November 2005/ 16 February 2006)	71 FR 69054 (29 November 2006/ 29 December 2006)	**No.** PSNS & IMF site excluded from killer whale Southern Resident DPS critical habitat.
Humpback whale Central America DPS, Mexico DPS (*Megaptera novaeangliae*)	T	81 FR 62260 (8 September 2016/ 11 October 2016)	86 FR 21082 (21 April 2021/ 21 May 2021)	**No.** Critical habitat has not been designated in the vicinity of PSNS & IMF.

Table 3.5-1: Threatened and Endangered Species and Their Designated Critical Habitat at Project Facilities (continued)

Common Name (*Scientific Name*)[1,2]	Federal Status[3]	Species Listing Final Rule (Published Date/Effective Date)	Critical Habitat Final Rule (Published Date/Effective Date)	Designated Critical Habitat at the Project Facility
Marbled murrelet (*Brachyramphus marmoratus*)	T	57 FR 45328 (1 October 1992/ 28 September 1992)	76 FR 61599 (5 October 2011/ 4 November 2011)	**No.** No critical habitat designation within the project area as the designations occur only in nesting habitat.
Sunflower sea star (*Pycnopodia helianthoides*)	PT	NMFS proposed the sunflower sea star as "threatened" on 16 March, 2023, in 88 FR 16212.		
PORT OF BENTON BARGE SLIP, WASHINGTON[5]				
Chinook salmon Upper Columbia River Spring-Run ESU (*Oncorhynchus tshawytscha*)	E	64 FR 14308 (24 March 1999/ 24 May 1999)	70 FR 52629 (2 September 2005/ 2 January 2006)	**Yes.** Overlaps with in-water portions of the Port of Benton barge slip project area.
Steelhead Upper Columbia River DPS, Middle Columbia River DPS (*Oncorhynchus mykiss*)	T	62 FR 43937 (18 August 1997/ 17 October 1997)		
	T	64 FR 14517 (25 March 1999/ 24 May 1999)		
Bull trout Columbia River DPS (*Salvelinus confluentus*)	T	63 FR 31647 (10 June 1998/ 10 July 1998)	75 FR 63898 (18 October 2010/ 17 November 2010)	**Yes.** Overlaps with in-water portions of the Port of Benton barge slip project area.

Table 3.5-1: Threatened and Endangered Species and Their Designated Critical Habitat at Project Facilities (continued)

Common Name (*Scientific Name*)[1,2]	Federal Status[3]	Species Listing Final Rule (Published Date/Effective Date)	Critical Habitat Final Rule (Published Date/Effective Date)	Designated Critical Habitat at the Project Facility
HAMPTON ROADS METROPOLITAN AREA, VIRGINIA[6]				
Atlantic sturgeon Chesapeake Bay DPS, New York Bight DPS, Carolina DPS, South Atlantic DPS, Gulf of Maine DPS (*Acipenser oxyrinchus oxyrinchus*)	E, T	77 FR 5880 (6 February 2012/ 6 April 2012)	82 FR 39160 (17 August 2017/ 18 September 2017)	**Yes**. Chesapeake Bay DPS overlaps with current mooring location and commercial shipyard facilities up the James River from Newport News Point.
Shortnose sturgeon (*Acipenser brevirostrum*)	E	32 FR 4001 (11 March 1967/ 11 March 1967)	**None designated**	
Green sea turtle North Atlantic DPS (*Chelonia mydas*)	T	81 FR 20057 (6 April 2016/ 6 May 2016)	63 FR 46693 (2 September 1998/ 2 October 1998)	**No.** Critical habitat has not been designated in the vicinity of Hampton Roads Metropolitan Area.
Kemp's ridley sea turtle (*Lepidochelys kempii*)	E	35 FR 18319 (2 December 1970/ 2 December 1970)	**None designated**	
Leatherback sea turtle (*Dermochelys coriacea*)	E	35 FR 8491 (2 June 1970/ 2 June 1970)	77 FR 4169 (26 January 2012/ 27 February 2012)	**No.** Critical habitat has not been designated in the vicinity of Hampton Roads Metropolitan Area.
Loggerhead sea turtle Northwest Atlantic Ocean DPS (*Caretta caretta*)	T	43 FR 32800 (28 July 1978/ 28 July 1978)	79 FR 39855 (10 July 2014/ 11 August 2014)	**No.** Critical habitat has not been designated in the vicinity of Hampton Roads Metropolitan Area.

Table 3.5-1: Threatened and Endangered Species and their Designated Critical Habitat at Project Facilities (continued)

Common Name (*Scientific Name*)[1,2]	**Federal Status[3]**	**Species Listing Final Rule (Published Date/ Effective Date)**	**Critical Habitat Final Rule (Published Date/Effective Date)**	**Designated Critical Habitat at the Project Facility**
PORT OF MOBILE, ALABAMA[7]				
Gulf sturgeon (*Acipenser oxyrinchus desotoi*)	T	56 FR 49653 (30 September 1991/ 30 October 1991)	68 FR 13369 (19 March 2003/ 18 April 2003)	**No.** Critical habitat has not been designated in the vicinity of the Port of Mobile, and there is none designated in Mobile Bay.
Alabama sturgeon (*Scaphirhynchus suttkusi*)	E	65 FR 26438 (5 May, 2000/ 5 June, 2000)	74 FR 26488 (2 June 2009/ 2 July 2009)	**No.** Critical habitat has not been designated in the vicinity of the Port of Mobile, and there is none designated in Mobile Bay.
Alabama red-bellied turtle (*Pseudemys alabamensis*)	E	52 FR 22939 (16 June 1987/ 16 July 1987)	**None designated**	
West Indian manatee (Florida subspecies) (*Trichechus manatus latirostris*)	T	82 FR 16668 (5 April 2017/ 5 May 2017)	42 FR 47840 (22 September 1977/ 23 September 1977)	**No**. Critical habitat has not been designated in the vicinity of the Port of Mobile, and there is none designated in Mobile Bay.
Green sea turtle North Atlantic DPS (*Chelonia mydas*)	T	81 FR 20057 (6 April 2016/ 6 May 2016)	63 FR 46693 (2 September 1998/ 2 October 1998)	**No**. Critical habitat has not been designated in the vicinity of the Port of Mobile, and there is none designated in Mobile Bay.
Hawksbill sea turtle (*Eretmochelys imbricata*)	E	35 FR 8491 (2 June 1970/ 2 June 1970)	63 FR 46693 (2 September 1998/ 2 October 1998)	**No**. Critical habitat has not been designated in the vicinity of the Port of Mobile, and there is none designated in Mobile Bay.

Table 3.5-1: Threatened and Endangered Species and their Designated Critical Habitat at Project Facilities (continued)

Common Name (*Scientific Name*)[1,2]	**Federal Status[3]**	**Species Listing Final Rule (Published Date/Effective Date)**	**Critical Habitat Final Rule (Published Date/ Effective Date)**	**Designated Critical Habitat at the Project Facility**
Kemp's ridley sea turtle (*Lepidochelys kempii*)	E	35 FR 18319 (2 December 1970/ 2 December 1970)	**None designated**	
Leatherback sea turtle (*Dermochelys coriacea*)	E	35 FR 8491 (2 June 1970/ 2 June 1970)	77 FR 4169 (26 January 2012/ 27 February 2012)	**No.** Critical habitat has not been designated in the vicinity of the Port of Mobile, and there is none designated in Mobile Bay.
Loggerhead sea turtle Northwest Atlantic Ocean DPS (*Caretta caretta*)	T	43 FR 32800 (28 July 1978/ 28 July 1978)	79 FR 39855 (10 July 2014/ 11 August 2014)	**No.** Critical habitat has not been designated in the vicinity of the Port of Mobile, and there is none designated in Mobile Bay.
PORT OF BROWNSVILLE FACILITIES, TEXAS[8]				
Green sea turtle North Atlantic DPS (*Chelonia mydas*)	T	81 FR 20057 (6 April 2016/ 6 May 2016)	63 FR 46693 (2 September 1998/ 2 October 1998)	**No**. Critical habitat has not been designated within or in the vicinity of Brownsville Ship Channel.

[1]A species with more than one DPS can have more than one ESA listing status, as individual DPSs can be either not listed under the ESA or can be listed as an endangered or threatened species.

[2]ESU is a population of organisms that is considered distinct for purposes of conservation. As with DPSs, a species with more than one ESU can have more than one ESA listing status.

[3] Some species with ESA listing status are also protected under individual states' laws. The analyses for these species and protective measures included in consultations with NMFS or USFWS are applicable to these species. Final rule dates indicate original dates. Updates are provided under species descriptions.

[4]Because of the routine activities of barge traffic into PSNS & IMF, normal dry dock operations within PSNS & IMF, and barge movements out of PSNS & IMF, these species are not analyzed in detail in this EIS/OEIS. Other species analyzed in the 2019 NMFS Programmatic Biological Opinion for PSNS & IMF (Hood Canal summer-run chum ESU, eulachon [Southern DPS], green sturgeon [Southern DPS], and leatherback sea turtle) may occur along the transportation routes (heavy-lift ship route to PSNS & IMF and the barge route from PSNS & IMF to the Columbia River) (see Appendix H [ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes]).

Table 3.5-1: Threatened and Endangered Species and their Designated Critical Habitat at Project Facilities (continued)

Common Name (*Scientific Name*)[1,2]	Federal Status[3]	Species Listing Final Rule (Published Date/Effective Date)	Critical Habitat Final Rule (Published Date/ Effective Date)	Designated Critical Habitat at the Project Facility

[5]Species noted here are analyzed only at the Port of Benton Barge Slip. Sockeye (Snake River ESU), Chinook (Snake River Spring/Summer-run ESU and Fall-run ESU), and steelhead (Snake River DPS) would be found in nearshore waters, up the Columbia River to the confluence with the Snake River. These species are known to occur upriver from the confluence, but there is no indication that they would reach the Port of Benton barge slip area.
[6]Hampton Roads Metropolitan Area includes the current mooring location of ex-Enterprise at Newport News Shipbuilding and commercial shipyard facilities that may be used for partial or complete dismantlement and in-water hull cleaning. All DPSs for the Atlantic sturgeon are listed as endangered except for the Gulf of Maine DPS, which is threatened.
[7]Sea turtle species are analyzed for potential impacts along the tow route through Mobile Bay. Sea turtles are not expected to occur at the Port of Mobile. The Navy analyzed potential impacts on the Alabama sturgeon and Alabama red-bellied turtle and determined that these species' current ranges are outside the areas potentially impacted by towing ex-Enterprise through Mobile Bay to a commercial dismantlement facility within the Port of Mobile.
[8]The green sea turtle was analyzed in the 2019 NMFS Programmatic Biological Opinion for towing into and dismantlement at the Port of Brownsville. The Navy also analyzed the potential for impacts on the jaguarundi (*Puma yagouaroundi*), ocelot (*Leopardus pardalis*), West Indian manatee, and other sea turtle species and determined that they would not likely occur within the ship channel; therefore, towing of ex-Enterprise into the Brownsville Ship Channel would have no effect on these three ESA-listed species.
Notes: E = Endangered, PT=Proposed Threatened, PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, T = Threatened, FR = Federal Register, ESU = Evolutionarily Significant Unit, DPS = Distinct Population Segment

3.5.1.4.3 Identification of Applicable Stressors for Analysis

Based on the literature review to describe the general biological environment at project areas and consultation documents submitted to NMFS and USFWS and supporting technical studies, the Navy was able to identify specific stressors within each alterative that may impact biological resources described in Section 3.5.2 (Affected Environment). The U.S. Environmental Protection Agency (EPA) defines stressors as any physical, chemical, or biological entity that can induce an adverse response, and defining stressors of a project as essential step to determine how the different project phases may impact biological resources (Crain et al., 2009; EPA, 2000). Stressors identified for analysis include the following:

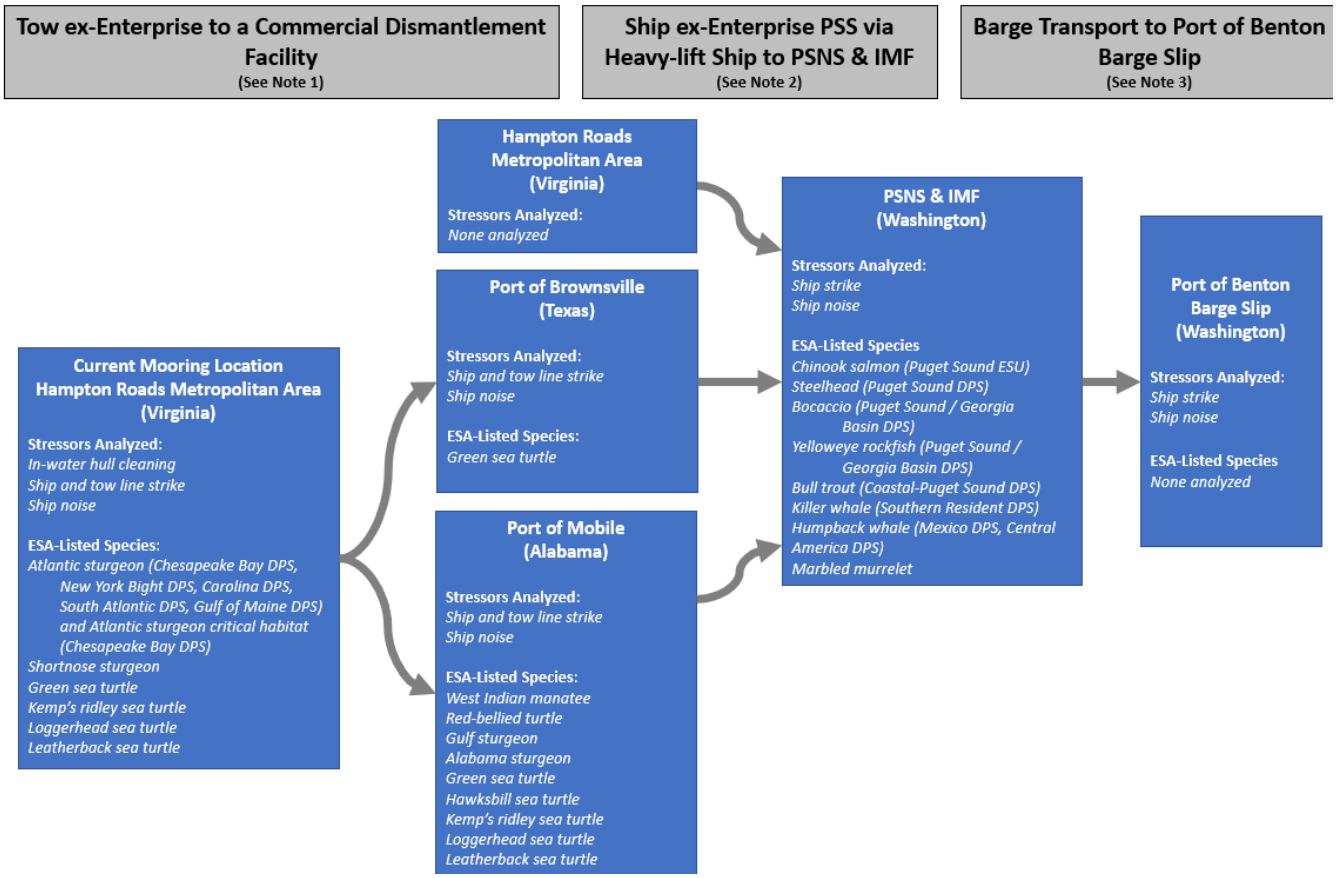
- stressors associated with in-water hull cleaning that potentially impact water and sediment quality at the current mooring location (Newport News Shipbuilding) or at a nearby facility within the Hampton Roads Metropolitan Area, including release of chemicals associated with antifouling paints and depression of dissolved oxygen (DO) from the decay of organic matter removed from the hull prior to towing
- stressors associated with ship strike and tow line strike, from towing of ex-Enterprise from the current mooring location to destination ports
- stressors associated with ship noise from ships in transit resulting from propulsion sounds as tug boats or heavy lift-ships transit through an area
- stressors associated with construction activities at the Port of Benton barge slip, Washington, including water and sediment quality impacts associated with barge slip and substrate modifications, as well as construction noise from on-land pile driving and in-water construction activities
- stressors associated with ground disturbance resulting from land transport route modifications from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site

3.5.1.4.4 Conceptual Frameworks for Analyzing Potential Impacts under Each Alternative

Once the Navy identified applicable stressors from different activities under each alternative described in Chapter 2 (Description of Proposed Action and Alternatives), the Navy constructed conceptual frameworks to analyze each alternative. The frameworks under each alternative follow the stepwise progression of ex-Enterprise from its current mooring location to either indefinite waterborne storage (as described under the No Action Alternative) or to final disposal of the ship and its reactor plants. These frameworks are used to guide each alternative analysis in Section 3.5.3 (Environmental Consequences). Figure 3.5-2, Figure 3.5-2, and Figure 3.5-4 provide the framework for analysis for each project phase for the action alternatives.

3.5.1.4.5 Determining the Appropriate Level of Detail for Analysis of each Project Component

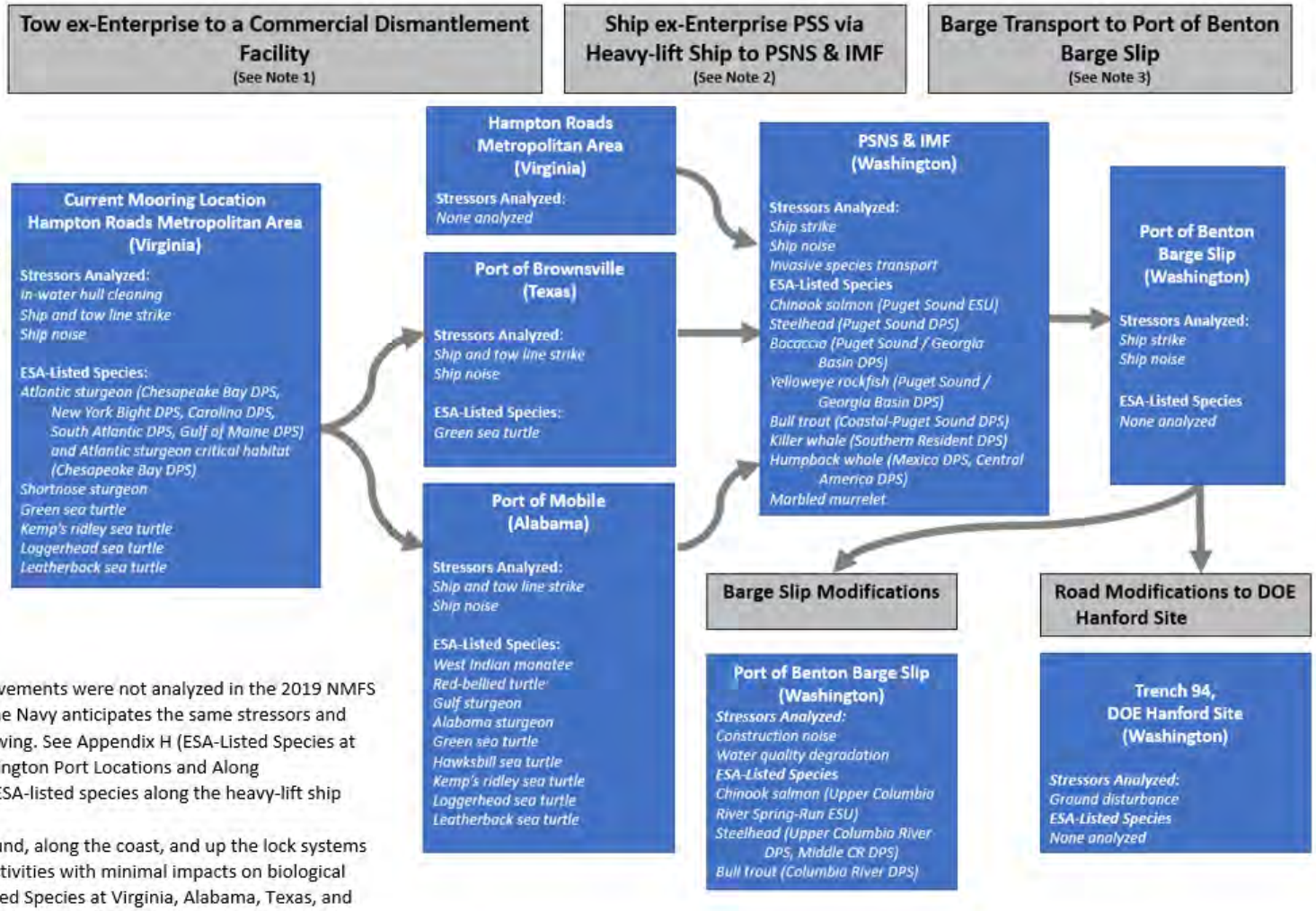
The Navy analyzed each sequential component under each alternative (activities described under each alternative in Chapter 2 [Description of Proposed Action and Alternatives]) to determine the appropriate level of detail to assess potential impacts on biological resources. Accordingly, the level of detail under each project component differs. Project components discussed under each alternative in Chapter 2 that would have no discernable impact on biological resources (e.g., the transport of waste and recyclables from a dismantlement facility to an approved waste or recycle facility, disposal of waste and recyclables) are not analyzed. Project components shown in Figure 3.5-2, Figure 3.5-3, and Figure 3.5-4 are analyzed under each alternative to a level of detail appropriate for the magnitude of the potential impact on biological resources.



1

Note 1: The Navy would first consider one of the dry-docking mitigation methods for hull cleaning, though this method would only be implemented if there is a sufficiently sized dry dock available during the required time frame that is close enough in proximity to the origination port to preclude risk of nonindigenous species transfer. See Appendix H (ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes) for a list of ESA-listed species along the tow routes. ESA-listed species between the current mooring location and Port of Brownsville were analyzed in the 2019 NMFS Programmatic Biological Opinion (NMFS, 2019). Port of Mobile was not included in 2019 consultation.
Note 2: Although heavy-lift ship movements were not analyzed in the 2019 NMFS Programmatic Biological Opinion, the Navy anticipates the same stressors and impacts as with the inactive ship towing. See Appendix H for a list of ESA-listed species along the heavy-lift ship routes.
Note 3: Barge traffic from Puget Sound, along the coast, and up the lock systems of the Columbia River are normal activities with minimal impacts on biological resources. See Appendix H for a list of ESA-listed species along the barge route between PSNS & IMF to the Port of Benton barge slip.

2 **Figure 3.5-2: Conceptual Analysis Framework for Alternative 1**

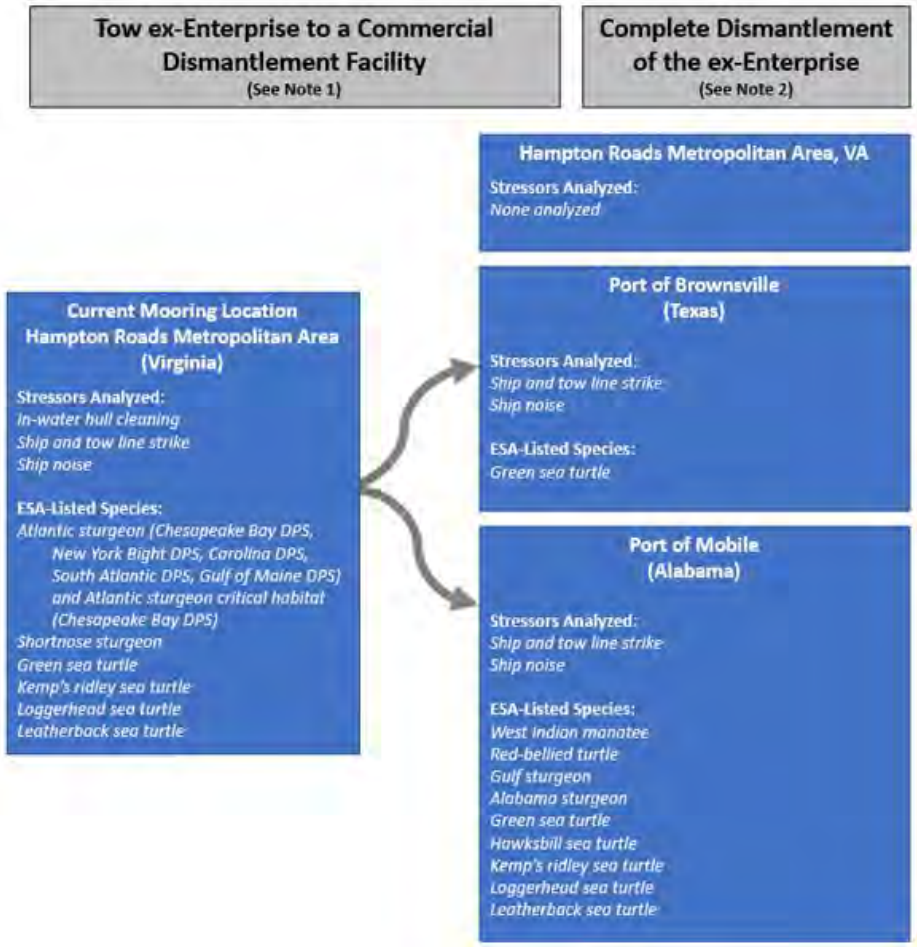


Note 1: The Navy would first consider one of the dry-docking mitigation methods for hull cleaning, though this method would only be implemented if there is a sufficiently sized dry dock available during the required time frame that is close enough in proximity to the origination port to preclude risk of nonindigenous species transfer. See Appendix H (ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes) for a list of ESA-listed species along the tow routes. ESA-listed species between the current mooring location and Port of Brownsville were analyzed in the 2019 NMFS Programmatic Biological Opinion (NMFS, 2019).

Note 2: Although heavy-lift ship movements were not analyzed in the 2019 NMFS Programmatic Biological Opinion, the Navy anticipates the same stressors and impacts as with the inactive ship towing. See Appendix H (ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes) for a list of ESA-listed species along the heavy-lift ship routes.

Note 3: Barge traffic from Puget Sound, along the coast, and up the lock systems of the Columbia River are normal activities with minimal impacts on biological resources. See Appendix H (ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes) for a list of ESA-listed species along the barge route between PSNS & IMF to the Port of Benton barge slip.

Figure 3.5-3: Conceptual Analysis Framework for Alternative 2



Note 1: The Navy would first consider one of the dry-docking mitigation methods for hull cleaning, though this method would only be implemented if there is a sufficiently sized dry dock available during the required time frame that is close enough in proximity to the origination port to preclude risk of nonindigenous species transfer. See Appendix H (ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes) for a list of ESA-listed species along the tow routes. ESA-listed species between the current mooring location and Port of Brownsville were analyzed in the 2019 NMFS Programmatic Biological Opinion (NMFS, 2019). Port of Mobile was not included in 2019 consultation.

Note 2: Complete dismantlement at a commercial dismantlement facility would occur at shipyard facilities and involve a limited amount of in-water work to dismantle ex-Enterprise.

Figure 3.5-4: Conceptual Analysis Framework for Alternative 3 (Preferred Alternative)

3.5.2 Affected Environment

3.5.2.1 Virginia

The areas considered for analysis for potential impacts on biological resources within Virginia include commercial and shipyard locations within the Hampton Roads Metropolitan Area, which includes the lower portions of the James River, the Elizabeth River, and shipyard locations along the lower Chesapeake Bay. Newport News Shipbuilding, the current mooring location of ex-Enterprise, is within the Hampton Roads Metropolitan Area along the northern bank of the lower reach of the James River. As described in Chapter 2 (Description of Proposed Action and Alternatives) and shown in Figure 2-2, indefinite waterborne storage or dismantlement activities of ex-Enterprise would occur in heavily industrialized shipyard locations. Dismantlement activities or indefinite waterborne storage of ex-Enterprise would not require new infrastructure and would occur within the existing industrialized footprints at these facilities.

As part of the literature review to describe the affected environment for biological resources, the Navy reviewed previous NEPA documentation that assessed impacts along the James and Elizabeth Rivers adjacent to shipyard locations identified in Chapter 2 (Description of Proposed Action and Alternatives); State of Virginia Natural Heritage Database queries; and available literature describing the general ecology of the area.

Shorelines along the James River and lower Chesapeake Bay within the Hampton Roads Metropolitan Area are heavily modified and constructed, with large-scale development of the site dating back to 1880s. The submerged lands along the Hampton Roads Metropolitan Area have undergone extensive piling construction, dredging, and filling over the last century at Virginia shipyards (Pearman, 2020). Development of the Norfolk Naval Shipyard area on Naval Station Norfolk in Portsmouth, Virginia, began in the early 1900s with the onset of World War I, which initiated shoreline modifications, channel dredging and maintenance of portions of the Elizabeth River (Navy, 2016). The average salinity along the James River, which can fluctuate widely due to the proximity to freshwater inputs, averages around 18–21 parts per thousand (ppt) (NMFS, 2019). For context, the average ocean salinity is 35 ppt (NMFS, 2019).

Open-water habitat at the current mooring location and shipyard facilities within the Hampton Roads Metropolitan Area likely support seasonal occurrences of bay anchovy (*Anchoa mitchilli*), blueback herring (*Alosa aestivalis*), Atlantic croaker (*Micropogonias undulatus*), alewife herring (*Alosa pseudoharengus*), and American shad (*Alosa sapidissima*) (Navy, 2017). Adult spawning migrations of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) may pass through areas in the Hampton Roads Metropolitan Area vicinity. Accordingly, this ESA-listed species is described in more detail in the section below. Several species of gulls (*Larus* spp.), terns (*Sterna* spp.), ducks (*Anas* spp.), and geese (*Branta* spp.) are commonly observed in open-water habitats of these shipyards.

Information on the establishment of invasive species within the shipyard locations was sourced from the Virginia Invasive Species website. Invasive fish species of note include the northern snakehead (*Channa argus*), blue catfish (*Ictalurus furcatus*), and channel catfish (*Ictalurus punctatus*), which are predominantly freshwater fish found in major river systems and tributaries in Virginia. Invasive shellfish of concern within the Chesapeake Bay and contributing waters include the veined rappa whelk (*Rapana venosa*) (an invasive predator of indigenous shellfish and shellfish fisheries), the Chinese mitten crab (*Eriocheir sinensis*) (first identified in the Chesapeake Bay in 2006 followed by rapid spreading into lower portions of rivers), rusty crayfish (*Faxonius rusticus*) (a freshwater species known to be an aggressive

invader in Virginian and West Virginian watersheds), and zebra mussels (*Dreissena polymorpha*) (first identified in northern Virginia in 2003). The invasive aquatic plant water hyacinth (*Eichhornia crassipes*) has been found in the James River with additional risk of invasion from giant salvinia (*Salvinia molesta*), water spinach (*Ipomoea aquatica*), and beach vitex (*Vitex rotundifolia*).

Atlantic Sturgeon (*Acipenser oxyrinchus*)

Status and Management. As indicated in Table 3.5-1, the Atlantic sturgeon population is comprised of five Distinct Population Segments (DPSs): the Carolina, South Atlantic, Chesapeake Bay, and New York Bight DPSs, which are listed as endangered, and the Gulf of Maine DPS, which is listed as threatened (77 FR 5880). Atlantic sturgeon in the project area of Newport News would most likely be part of the Chesapeake Bay DPS. The Chesapeake Bay DPS is comprised of Atlantic sturgeon that originate from rivers that drain into the Chesapeake Bay and into coastal waters from the Delaware-Maryland border on Fenwick Island to Cape Henry, Virginia. However, individuals from other DPSs, especially the Carolina and New York Bight DPSs, also could occur in this region (Hager, 2019). Critical habitat has been designated within several rivers throughout the sturgeon's range (82 FR 39160), including the James River within the Newport News project area.

The Atlantic sturgeon is an anadromous fish, meaning they are born in fresh water, migrate into salt water where they grow and mature, then migrate back into fresh water as adults to spawn. They undergo these seasonal migrations between freshwater ecosystems where they spawn and shallow marine waters (33 to 164 feet [ft.] [10 to 50 meters {m}]) where they forage and grow (Hager, 2019). They are found along the entire U.S. East Coast. Atlantic sturgeon adults may undertake north-south seasonal migrations (Hager, 2019), and Rothermel et al. (2020) observed that Atlantic sturgeon along the mid-Atlantic coastal shelf tend to stay closer to shore in spring and summer and move to deeper waters in winter. During non-spawning years, adults may remain in marine waters year-round, although they may enter estuarine waters as well (Hager, 2019; Rothermel et al., 2020). Preferred habitat includes sand and gravel substrates (Stein et al., 2004). This species was once found throughout Chesapeake Bay and its freshwater rivers, but it is now very rare. However, they inhabit both the main stem of the Chesapeake Bay and several of its riverine systems, including the James River.

Adult spawning runs are not completely understood. In rivers from Georgia to the Chesapeake Bay, spawning occurs during the late summer and fall. Atlantic sturgeon may migrate up into the Chesapeake Bay tributaries both in the spring and the fall to spawn (Balazik et al., 2012a; Rothermel et al., 2020), although recent research in the mid-Atlantic indicates that spawning regularly occurs in the fall with limited evidence of a spring spawn in some rivers (Kahn, 2019; Balazik et al., 2012a; Hager, 2019; Hager et al., 2014; Savoy & Pacileo, 2011). For the fall run, most spawning adults migrate upriver beginning in late July to August and return to the lower Chesapeake Bay and offshore waters by November (Balazik et al., 2012a; Hager, 2019; Hager et al., 2014).

Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat in Virginia for the Atlantic sturgeon on the Rappahannock, York, Mattaponi, and James Rivers (82 FR 39160). Several commercial dismantlement facilities along Hampton Roads Metropolitan Area are included in the critical habitat designation (Figure 3.5-5).



Figure 3.5-5: Critical Habitat Designation for the Atlantic Sturgeon (Chesapeake Bay DPS) at Hampton Roads Metropolitan Area, Virginia

In designating critical habitat, NMFS identified the following primary biological features as essential to the conservation of the Atlantic sturgeon:

- hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder) in low salinity waters (i.e., 0–0.5 ppt) for settlement of fertilized eggs, refuge, growth, and development of early life stages
- aquatic habitat with a gradual downstream salinity gradient of 0.5 up to as high as 30 ppt and soft substrate (e.g., sand, mud) between the river mouth and spawning sites for juvenile foraging and physiological development
- water of appropriate depth and absent physical barriers to passage (e.g., locks, dams, thermal plumes, turbidity, sound, reservoirs, gear) between the river mouth and spawning sites necessary to support (1) unimpeded movement of adults to and from spawning sites, (2) seasonal and physiologically dependent movement of juvenile Atlantic sturgeon to appropriate salinity zones within the river estuary, and (3) staging, resting, or holding of subadults or spawning condition adults; water depths in main river channels must also be deep enough (e.g., at least 3.9 ft. [1.2 m]) to ensure continuous flow in the main channel at all times when any sturgeon life stage would be in the river
- water, between the river mouth and spawning sites, especially in the bottom meter of the water column, with the temperature, salinity, and oxygen values that, combined, support: (1) spawning; (2) annual and interannual adult, subadult, larval, and juvenile survival; and (3) larval, juvenile, and subadult growth, development, and recruitment (e.g., 55 to 79 degrees Fahrenheit [°F; 13 to 26 degrees Celsius (°C)] for spawning habitat and no more than 86 °F [30 °C] for juvenile rearing habitat, and 6 milligrams per liter or greater DO for juvenile rearing habitat)

The waters of the project area would provide some of these essential features supporting sturgeon in transit between the lower Chesapeake Bay and spawning grounds up the James River. However, Newport News Shipbuilding is located within the active port of Newport News, so the project area would not represent pristine river habitat, and obstructions such as piers would be present, although the port structures do not fully obstruct river passage.

Potential Occurrence within Hampton Roads Metropolitan Area Shipyard Locations. The distribution of Atlantic sturgeon is strongly associated with prey availability. Like all sturgeon, Atlantic sturgeon feed along the seafloor on invertebrates, such as crustaceans, worms, and mollusks, as well as bottom-dwelling fish, such as sand lance (*Ammodytes* spp.). Atlantic sturgeon may occur where suitable forage conditions (e.g., benthic invertebrates) and appropriate habitat (e.g., areas of sand or submerged aquatic vegetation) are present (Savoy & Pacileo, 2011; Stein et al., 2004; Welsh et al., 2002). The Navy identified ESA-listed Atlantic sturgeon at the current mooring location at Newport News Shipbuilding. Although they may occur within the project area year-round, they would be most likely to be present during spring and fall as adults are migrating between the estuarine Chesapeake Bay and their spawning habitat within the James River. Subadults have been observed to stop and forage off of Naval Station Norfolk (located down river from Newport News), but adults transit through the lower James River without foraging (Hager, 2019). In summary, Atlantic sturgeon presence within the project areas is anticipated to be rare and intermittent.

Shortnose Sturgeon (*Acipenser brevirostrum*)

Status and Management. The shortnose sturgeon is an endangered species originally protected under the Endangered Species Preservation Act of 1966 (32 FR 4001); it remained on the endangered species list with the enactment of the ESA in 1973 (see Table 3.5-1). Shortnose sturgeon is an anadromous species that primarily inhabits rivers and estuaries. Shortnose sturgeon spawn in the coastal rivers along the East Coast of North America from the St. John River in Canada to the St. Johns River in Florida (Deslauriers & Kieffer, 2012; NMFS, 1998). Individual shortnose sturgeon spend most of the year in the lower reaches of their spawning rivers, only occasionally venturing out into the Chesapeake Bay (NMFS, 1998; Stein et al., 2004; Welsh et al., 2002). In estuarine systems, juveniles and adults occupy areas with little or no current over a seafloor composed primarily of mud, sand, or cobble (NMFS, 1998; Stein et al., 2004). Shortnose sturgeons are benthic feeders that prey upon crustaceans, mollusks, and insects (NMFS, 1998). Preferred prey is influenced by life stage. For example, juveniles prefer insect larvae and small crustaceans, while adults feed primarily on small mollusks (NMFS, 1998).

Critical Habitat. There is currently no critical habitat designated for the shortnose sturgeon.

Potential Occurrence within Hampton Roads Metropolitan Area Shipyard Locations. Shortnose sturgeon in the mid-Atlantic typically move upstream in the fall, overwinter in deeper waters of their river systems downstream of spawning habitat, and then spawn in the upper tributaries in spring (NMFS, 1998; Welsh et al., 2002). Spawning is known to occur in some river systems of the Chesapeake Bay, including the Potomac River (Balazik, 2017), but spawning has not been identified in the James River.

A fishery-dependent study from 1996 to 2000 expanded upon the knowledge about the movement of shortnose sturgeon within Chesapeake Bay and determined that the distribution of the population is centered in the upper Chesapeake Bay (e.g., lower Susquehanna River) (Welsh et al., 2002). In this study, movements of tagged fish confirmed that shortnose sturgeon utilize the Chesapeake & Delaware Canal to move between the Chesapeake and Delaware Bays (Welsh et al., 2002). Since the implementation of the sturgeon reward program in 1996, shortnose sturgeon have been reported in the upper Bay, from Kent Island to the mouth of the Susquehanna River and the Chesapeake & Delaware Canal, as well as farther south in the Potomac River (Balazik, 2017; NMFS, 1998). This reward program resulted in only one confirmed capture of a shortnose sturgeon in Virginia waters (Balazik, 2017). Shortnose sturgeon are reported only rarely in the lower Chesapeake Bay (Welsh et al., 2002), and the first shortnose sturgeon in the freshwater portions of the James River was reported most recently in 2016 (Balazik, 2017).

Green Sea Turtle (*Chelonia mydas*) – North Atlantic DPS

Status and Management. NMFS and USFWS first listed the green sea turtle as endangered under the ESA on July 28, 1978 (43 FR 32800). As indicated in Table 3.5-1, NMFS and USFWS reclassified the species into 11 DPSs in 2016 (81 FR 20057). The geographic areas that include these DPSs are (1) North Atlantic Ocean, (2) Mediterranean Sea, (3) South Atlantic Ocean, (4) Southwest Indian Ocean, (5) North Indian Ocean, (6) East Indian Ocean – West Pacific Ocean, (7) Central West Pacific Ocean, (8) Southwest Pacific Ocean, (9) Central South Pacific Ocean, (10) Central North Pacific Ocean, and (11) East Pacific Ocean. The North Atlantic DPS is listed as threatened.

The green sea turtle is distributed worldwide across tropical and subtropical coastal waters. After emerging from the nest, green turtle hatchlings swim to offshore areas where they float passively in major current systems; however, laboratory and modeling studies suggest that juvenile turtle dispersal

trajectories might also be shaped by active swimming (Christiansen et al., 2016; Putman & Mansfield, 2015). Post-hatchling green turtles forage and develop in floating *Sargassum* habitats of the open ocean. At the juvenile stage (estimated at five to six years) they leave the open-ocean habitat and retreat to protected lagoons and open coastal areas that are rich in seagrass or marine algae (Bresett et al., 2006; National Oceanic and Atmospheric Administration, 2022) where they will spend most of their lives (National Oceanic and Atmospheric Administration, 2022). The optimal developmental habitats for late juveniles and foraging habitats for adults are warm, shallow waters (9.8–16 ft. [3–5 m] deep) with abundant submerged aquatic vegetation and close to near shore reefs or rocky areas (Holloway-Adkins, 2006; Seminoff et al., 2002).

Critical Habitat. As indicated in Table 3.5-1, NMFS and USFWS designated critical habitat in 1998 for green sea turtles in coastal waters around Culebra Island, Puerto Rico, from the mean high-water line seaward to 3 nautical miles (nm) to include the outlying Keys of Culebra (63 FR 46693); however, no project area or transportation route would be within designated critical habitat for the green sea turtle.

Potential Occurrence within Hampton Roads Metropolitan Area Shipyard Locations. Juvenile green turtles use estuaries along the Atlantic Coast, including the Chesapeake Bay, as summer developmental habitat. During the winter, the highest concentration of juvenile green turtles occurs just north of Cape Canaveral. Most green sea turtle sightings north of Florida are of juveniles and occur during late spring to early fall (Burke et al., 1992; Epperly et al., 1995; Lazell, 1980).

Green turtles occur within Chesapeake Bay during warmer months of the year, although they are less common than loggerhead or Kemp's ridley sea turtles (Barco et al., 2018). Since 2013, the Navy has been tagging turtles in Chesapeake Bay and other Virginia waters and tracking them via an acoustic array (Barco et al., 2018). In the 2017 tagging season, only a single, cold-stunned green sea turtle was identified and tagged (Barco et al., 2018). This green sea turtle was not detected on the Navy array, but it was detected on receivers in the Lynnhaven River watershed and the mouth of the James River (Barco et al., 2018). Between 2001 and 2013, 108 green sea turtles have stranded in Virginia (Barco & Swingle, 2014). Most green turtle strandings in Virginia waters occur in the summer and fall, and most strandings are juveniles (Barco & Swingle, 2014). One stranding occurred near Newport News, and several strandings have occurred in nearby Norfolk (Barco & Swingle, 2014).

Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)

Status and Management. The Kemp's ridley sea turtle was originally protected as an endangered species under the Endangered Species Preservation Act of 1966 (35 FR 18319); it remained on the endangered species list with the enactment of the ESA in 1973 (see Table 3.5-1). Kemp's ridley sea turtles occur in the Gulf of Mexico and along the U.S. East Coast (NMFS & USFWS, 2015). Habitats frequently used in U.S. waters are warm-temperate to subtropical sounds, bays, estuaries, tidal passes, shipping channels, and beachfront waters, where their preferred food, the blue crab (*Callinectes sapidus*), is abundant (Lutcavage & Musick, 1985; NMFS & USFWS, 2015; Seney & Musick, 2005).

Evidence suggests that post-hatchling and small juvenile Kemp's ridley sea turtles, similar to other sea turtle species, forage and develop in floating *Sargassum* habitats of the North Atlantic Ocean. Juveniles migrate to habitats along the Atlantic continental shelf from Florida to New England at around two years of age (NMFS & USFWS, 2015; Peña, 2006). Suitable developmental habitats are seagrass beds and mud bottoms in waters of less than 33 ft. (10 m) in depth and with sea surface temperatures between 72 and 90° F (22 and 32° C) (Coyne et al., 2000).

In the spring, as waters become warmer, Kemp's ridley turtles in the Atlantic travel as far north as Long Island Sound and even Nova Scotia (NMFS & USFWS, 2015). However, they are typically only present in these northern waters when temperatures are warm, as they are subject to cold-stunning if they remain in waters that drop below 50 °F (10 °C) (Robinson et al., 2020). When temperatures begin to drop, turtles in northern waters will migrate to either coastal waters off the southeast United States or oceanic waters of the Gulf Stream (Robinson et al., 2020). In tracking the southern migrations of tagged sea turtles released from Long Island Sound, Robinson et al. (2020) observed two migration patterns from Kemp's ridley turtles: (1) a southerly migration along the coast to Florida and North Carolina foraging areas; and (2) a southerly migration along the coast to North Carolina and then a shift into the Gulf Stream and out to offshore waters. Coastal migrations were within 62 miles (mi.) (100 kilometers [km]) of the coast and in waters less than 656 ft. (200 m) deep (Robinson et al., 2020). There have been occasional instances of nesting documented along the U.S. East Coast (NMFS & USFWS, 2015), but nesting is not expected to occur in the areas potentially affected by the Proposed Action and alternatives.

Critical Habitat. There is currently no critical habitat designated for Kemp's ridley sea turtles.

Potential Occurrence within Hampton Roads Metropolitan Area Shipyard Locations. Between 2001 and 2013, 519 Kemp's ridley sea turtles have stranded in Virginia, more than four times as many as any other sea turtle species except loggerhead turtles (which had 2,807 strandings during the same period) (Barco & Swingle, 2014). Kemp's ridley strandings have occurred in the lower Chesapeake Bay within the Hampton Roads Metropolitan Area in all seasons (Barco & Swingle, 2014). In May to September of 2017, roughly 30 Kemp's ridley sea turtles were caught and 21 were tagged as part of the Navy's turtle tagging and tracking efforts (Barco et al., 2018). Kemp's ridley turtles tagged in 2017 moved from release areas along the Virginia Beach oceanfront to river mouths (including the James River), inland bays, and flats in the mainstem Chesapeake Bay; a similar pattern was observed in previous years as well (Barco et al., 2018). Most of the sea turtle tag recordings occurred during spring and fall before the turtles migrated south. It was noted that, in the project area, tagged animals seemed to be foraging rather than transiting, based on their movements (Barco et al., 2018). In general, Kemp's ridleys seem to recruit to shallow inlets within the lower Chesapeake, likely to forage on blue crabs (Barco et al., 2018).

Leatherback Sea Turtle (*Dermochelys coriacea*)—Northwest Atlantic DPS

Status and Management. The leatherback sea turtle was originally protected as an endangered species under the Endangered Species Preservation Act of 1966 (35 FR 8491); it remained on the endangered species list with the enactment of the ESA in 1973 (see Table 3.5-1). Although listed as endangered throughout its range, NMFS has recognized seven DPSs worldwide (NMFS & USFWS, 2020).

The leatherback turtle is the most widely distributed of all sea turtles, found from tropical to subpolar oceans from 71 °N to 47 °S (James et al., 2005; NMFS & USFWS, 2020). Adult leatherback turtles forage in temperate and subpolar regions in all oceans, and they migrate to tropical nesting beaches (Myers & Hays, 2006; NMFS & USFWS, 1992), although there is evidence of continued foraging in tropical latitudes as well (Myers & Hays, 2006). Leatherbacks have a wide nesting distribution, primarily on high-energy mainland beaches in tropical and, occasionally, subtropical latitudes (NMFS & USFWS, 2020), and to a lesser degree, on some islands.

Critical Habitat. NMFS designated critical habitat for the Northwest Atlantic DPS in 2012 (77 FR 4169), but it is not in the vicinity of the James River.

Potential Occurrence within Hampton Roads Metropolitan Area Shipyard Locations. Between 2001 and 2013, 92 leatherback sea turtles stranded in Virginia (Barco & Swingle, 2014), a relatively small number in comparison to the 2,807 loggerhead and 519 Kemp's ridley turtles that stranded during the same period. None of these strandings occurred at along the James River, and very few occurred beyond the mouth of the Chesapeake Bay (Barco & Swingle, 2014). Leatherback sea turtles may occur within the Hampton Roads Metropolitan Area, but they would be rare, especially in fall and winter.

Loggerhead Sea Turtle (*Caretta caretta*)—Northwest Atlantic Ocean DPS

Status and Management. As indicated in Table 3.5-1, NMFS determined the loggerhead sea turtle is endangered under the ESA (43 FR 32800). On September 22, 2011, NMFS designated nine DPSs (76 FR 58868), five of which are listed as endangered and four of which are listed as threatened. Only the Northwest Atlantic Ocean DPS, which is listed as threatened, would be expected to occur within the Hampton Roads Metropolitan Area.

Loggerhead sea turtles inhabit all temperate and tropical regions of the Atlantic Ocean. They occur in U.S. waters (including the Gulf of Mexico and U.S. East Coast) in habitats ranging from coastal estuaries to far beyond the continental shelf (Guyer et al., 2015; Hopkins-Murphy et al., 2003; Roberts et al., 2005; USFWS, 2020a).

Many loggerhead hatchlings reside in the pelagic waters of the North Atlantic Gyre (USFWS, 2020a) where, as juveniles, they associate with mats of *Sargassum* for years before returning to nearshore areas (The State of the World's Sea Turtles, 2022; USFWS, 2020a). Loggerhead hatchlings float passively in major current systems; however, laboratory and modeling studies suggest that juvenile dispersal trajectories might also be shaped by active swimming (Christiansen et al., 2016). Some juveniles migrate between oceanic and nearshore habitats as turtles move seasonally from open-ocean current systems (winter) to nearshore foraging areas (summer) (Bolten, 2003; Conant et al., 2009; Mansfield, 2006).

Loggerhead sea turtles are primarily carnivorous in both open-ocean and nearshore habitats, although they also consume some plant matter (Bjorndal, 1997; Conant et al., 2009). They forage over a variety of benthic hard- and soft-bottom habitats, and they also capture prey throughout the water column (Bjorndal, 2003; USFWS, 2020a). Adult loggerheads feed on a variety of gelatinous prey (e.g., jellyfish) and bottom-dwelling animals, such as crabs, sea urchins, and sponges (Fukuoka et al., 2016; Pajuelo et al., 2016).

Critical Habitat. As indicated in Table 3.5-1, NMFS and USFWS designated critical habitat throughout a large portion of the Atlantic Ocean and Gulf of Mexico (79 FR 39855), but there is no critical habitat in the vicinity of the James River.

Potential Occurrence within Hampton Roads Metropolitan Area Shipyard Locations. Although loggerhead sea turtles may be present off the southeast United States year-round, in the northeast and mid-Atlantic regions, they are seasonally present. Shoop and Kenney (1992) estimated that a minimum of 8,000 to 11,000 loggerheads are present in the northeastern U.S. continental shelf waters each summer, with the highest summer occurrence in waters over the mid-continental shelf, roughly from Delaware Bay to Hudson Canyon. Juveniles are frequently observed in developmental habitats, including coastal inlets, sounds, bays, estuaries, and lagoons with depths less than 328 ft (100 m) (Hopkins-Murphy et al., 2003; Turtle Expert Working Group, 1998). Long Island Sound, Cape Cod Bay, and Chesapeake Bay are the most frequently used juvenile developmental habitats along the northeastern U.S. continental shelf (Conant et al., 2009; Mansfield, 2006; Prescott, 2000; University of Delaware Sea Grant, 2000).

Essential Fish Habitat

EFH and Habitat Areas of Particular Concern (HAPC) designated within the Hampton Roads Metropolitan Area is under the jurisdiction of the Mid-Atlantic Fishery Management Council. However, EFH within the area has been designated for specific life stages of some species that are under the jurisdiction of the New England Fishery Management Council. In addition, NMFS has assumed the responsibility of designating EFH and HAPC for federally managed highly migratory species (e.g., tunas, billfish, swordfish, and sharks) in the U.S. waters of the Atlantic Ocean and the Gulf of Mexico, as these species are not restricted to the waters under the jurisdiction of any single Fishery Management Council. Within the Hampton Roads Metropolitan Area, the likelihood of encountering highly migratory species managed by NMFS is low, but EFH is designated within the Hampton Roads Metropolitan Area for some of these species.

EFH within the Hampton Roads Metropolitan Area (where in-water hull cleaning would occur) includes water column, bottom substrates such as soft sediments, and biogenic habitats such as submerged aquatic vegetation and oyster reefs. Federally managed fish species found in the Hampton Roads Metropolitan Area include sand tiger shark (*Carcharias taurus*), sandbar shark (*Carcharhinus plumbeus*), Atlantic herring (*Clupea harengus*), clearnose skate (*Raja eglanteria*), windowpane flounder (*Scophthalmus aquosus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), summer flounder (*Paralichthys dentatus*), and black sea bass (*Centropristis striata*). The Navy has consulted with NMFS for potential impacts on EFH for activities described under Alternative 3 (Preferred Alternative). Agency documentation is provided in Appendix D (Consultation Correspondence).

3.5.2.2 Alabama

The areas considered for analysis for potential impacts on biological resources within Alabama include the location of the commercial facilities in Mobile, where dismantlement could occur. As described in Chapter 2 (Description of Proposed Action and Alternatives) and shown in Figure 2-8, dismantlement activities would occur in heavily industrialized portions along this corridor. Dismantlement activities would not require new infrastructure and would occur within the existing industrialized footprints of facilities within Mobile.

As part of the literature review to describe the affected environment for biological resources, the Navy reviewed previous NEPA documentation that assessed impacts within the Federal Mobile Harbor Navigation Channel; Alabama Natural Heritage Program queries for the Mobile River near port facilities; and available literature describing the general ecology of the area.

Mobile Bay is an estuary which serves as a transition zone where the freshwater from the rivers mix with the tidally influenced saltwater of the Gulf of Mexico. Mobile Bay is recognized as a major national estuary of the United States since 1995, with the designation as one of 28 National Estuary Programs established by the EPA. The outflow of the Mobile River into Mobile Bay has created the second-largest intact river delta system in the nation (Greening et al., 2018). The Mobile Bay and the Mobile-Tensaw River Delta supports a diverse set of fish and wildlife habitats, including bogs, bottomland hardwoods, freshwater and hardwood swamps, freshwater wetlands, maritime forests, pine savanna, submerged aquatic vegetation, tidal and brackish water marshes, and oyster reefs (Byrnes et al., 2017).

In contrast, commercial shipyard locations within the Port of Mobile and the Federal Mobile Harbor Navigation Channel are heavily industrialized and located near metropolitan Mobile (USACE, 2014). The submerged lands within the Port of Mobile vicinity have undergone extensive expansion, including pile

construction, maintenance dredging, and shoreline stabilization and channelization since World War II, culminating in extensive river channeling and shipping network construction in the 1970s and early 1980s (Peachey, 2003).

In open-water habitats within the Federal Mobile Harbor Navigation Channel near commercial shipyard facilities, several species of macroinvertebrates likely occur, such as the following (DOT & Alabama Department of Transportation, 2019):

- blue and stone crabs (*Callinectes sapidus* and *Menippe adina*)
- crayfish (*Procambarus* spp.)
- various species of shrimp (*Penaeus aztecus*, *P. duorarum*, and *P. setiferus*)

Representative fish species likely include the following:

- blue and channel catfish (*Ictalurus furcatus* and *I. punctatus*)
- striped and largemouth bass (*Morone* spp.)
- sunfish (*Lepomis macrochirus*, *L. punctatus*, *L. microlophus*)
- Spanish mackerel (*Scomberomorus maculatus*)

Invasive aquatic species in the vicinity of shipyard locations are typical of the Gulf Coast and include the island apple snail (*Pomacea maculata*), Asian clam (*Corbicula fluminea*), and tilapia (*Oreochromis* spp.) (Alabama Natural Heritage Program, 2020).

The most proximate record of a bald eagle nest near the Port of Mobile is approximately 10 mi. away along Bay Minette Creek. Bald eagles would not be expected to forage within the Federal Mobile Harbor Navigation Channel adjacent to the commercial shipyard facilities (USACE, 2019). In addition, the bottlenose dolphin (*Tursiops truncatus*), a non-ESA listed marine mammal protected under the MMPA, is known to occur within the Federal Mobile Harbor Navigation Channel (Alabama Natural Heritage Program, 2020).

During a literature review of biological resources within the Port of Mobile project area, the Navy identified four ESA-listed species that have potential to occur within the Mobile River channel that runs through the Port of Mobile shipyard facilities. These species include the Alabama sturgeon (*Scaphirhynchus suttkusi*), Gulf sturgeon (*Acipenser oxyrhynchus desotoi*), Alabama red-bellied turtle (*Pseudemys alabamensis*), and West Indian manatee (*Trichechus manatus latirostris*). The regulatory status, critical habitat designations, and potential occurrence of these species within the Port of Mobile project area are summarized below.

Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)

Status and Management. The Gulf sturgeon is an anadromous species that occurs in bays, estuaries and rivers, and in the marine environment from Florida to Louisiana. As indicated in Table 3.5-1, NMFS determined the Gulf sturgeon is threatened under the ESA (56 FR 49653). The fishery for the species has been closed since being listed. Bycatch (the unintentional catching of unintended species in commercial fisheries) along the Gulf coast was a major source of mortality (USFWS, 1995), and efforts to reduce bycatch include gear modifications for nearshore trawl fisheries (NMFS, 2010).

Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat for Gulf sturgeon within and adjacent to the states of Louisiana, Mississippi, Alabama, and Florida (68 FR 13369). There is no critical habitat designated within the Mobile River channel through the Port of Mobile shipyard facilities or within the greater Mobile Bay area.

Potential Occurrence within the Port of Mobile and Transportation Route. Mobile Bay once supported the largest-ever commercial catch of Gulf sturgeon, reported in 1902 (Ross et al., 2009; USFWS & NMFS, 2009). Mobile River records from fishermen or scientific sampling have been few, limited to single individuals, and restricted to the lower river and estuary, with the last report in the early 1990s (USACE, 2019). With the loss of deep holes from maintenance dredging activities that serve as critical seasonal holding habitat, this species is likely extirpated from the extensively impounded, fragmented, and dredged Mobile River system (USACE, 2019).

Alabama Sturgeon (*Scaphirhynchus suttkusi*)

Status and Management. As indicated in Table 3.5-1, USFWS determined the Alabama sturgeon is listed as endangered under the ESA (65 FR 26438). This species once ranged within all major rivers in the Mobile Basin, including the Alabama, Tombigbee, Black Warrior, Coosa, Tallapoosa, and Cahaba River systems. Records are extremely rare—the last observed Alabama sturgeon was in 2009 (Stewart et al., 2012). This riverine species is currently believed to be restricted to the lower portions of the Cahaba and Alabama rivers in south Alabama (Kuhajda & Rider, 2016).

Critical Habitat. As indicated in Table 3.5-1, USFWS designated critical habitat for the Alabama sturgeon within the river channels of the Alabama, Tallapoosa, and Cahaba Rivers (74 FR 26488). Critical habitat was not designated in the Mobile River; therefore, there is no critical habitat at Port of Alabama shipyard facilities.

Potential Occurrence within the Port of Mobile and Transportation Route. Because of the extensive dredging activities and reduced flow into the Mobile River from upstream lock and dam systems, the Alabama sturgeon is believed to be extirpated from the portions of the Mobile River that flow through shipyard facilities at the Port of Mobile. Therefore, it is highly unlikely that this species would be present within the project area.

Alabama Red-bellied Turtle (*Pseudemys alabamensis*)

Status and Management. As indicated in Table 3.5-1, USFWS determined the Alabama red-bellied turtle is listed as endangered under the ESA (52 FR 22939). Found almost exclusively in the Mobile-Tensaw Delta, the greatest threats to this species are loss or degradation of habitat, especially the loss and degradation of the submerged aquatic vegetation on which the turtle depends.

Critical Habitat. The USFWS has not designated critical habitat for this species.

Potential Occurrence within the Port of Mobile and Transportation Route. Alabama red-bellied turtles typically occur in broad, vegetated expanses of shallow water in the backwater areas of bays, in and along river channels, and less frequently in oxbow lakes. Snags and dense beds of submersed and emergent aquatic vegetation provide turtles with a substrate for cover, predator avoidance, food, and structure for basking and thermoregulation. Although regarded as a freshwater species, the occasional presence of barnacles on shells indicates that the turtle is tolerant, to some extent, of saline waters. In Alabama, the turtle occupies the freshwater of shallow side-channel coves along the main river channels draining into Mobile Bay, as well as smaller tributary streams and broad, shallow brackish bays surrounding Mobile Bay. Because shipyard locations within the Port of Mobile do not contain these shallow waters, soft bottoms, and submerged aquatic vegetation, any occurrence of this species within the project area would be considered extremely rare.

West Indian Manatee (*Trichechus manatus latirostris*)

Status and Management. The West Indian manatee was originally protected as an endangered species under the Endangered Species Preservation Act of 1966 (32 FR 4001); it remained on the endangered species list with the enactment of the ESA in 1973 (see Table 3.5-1). In 2017, USFWS downlisted the West Indian manatee from endangered to threatened (82 FR 16668). West Indian manatees inhabit marine, brackish, and freshwater ecosystems in coastal and riverine habitats throughout their range. Their range includes the eastern United States, eastern Gulf of Mexico, Caribbean, and northern areas of South America. They inhabit waters off the coast of Florida throughout the year, but the rest of their range is seasonally restricted. West Indian manatees cannot tolerate temperatures below 68° F (20° C) for extended periods of time, and during the winter months, their population is concentrated in the warmer waters around the Florida peninsula. During the summer months when the water temperatures are warmer, they have been sighted as far north as Massachusetts and as far west as Texas. They prefer nearshore habitats featuring underwater vegetation, like seagrass and eelgrass (Runge et al., 2015; USFWS, 2014). Although manatees have been found using waters as shallow as 1.3 ft (0.4 m), they typically utilize locations with access channels that are at least 3–7 ft (1–2 m) deep (Lefebvre et al., 2001; Runge et al., 2015).

The Florida subspecies is divided into four management units: the Upper St. Johns River (4 percent of the population), Atlantic Coast (46 percent), Southwest Florida (38 percent), and Northwest Florida (12 percent). The Northwest Florida management unit would be most likely to occur within Mobile Bay (Cloyed et al., 2021). Although individuals from the Southwest Florida management unit might occur rarely within Mobile Bay, individuals from the Atlantic populations rarely enter the Gulf of Mexico and would not be expected to occur in the Port of Alabama or within Mobile Bay (USFWS, 2014).

Critical Habitat. As indicated in Table 3.5-1, USFWS designated critical habitat for the West Indian manatee in 1977 along designated rivers, streams, and bays located on the east and west coast of Florida (42 FR 47840). No portion of the transportation routes for ex-Enterprise would traverse these areas. Therefore, no critical habitat designated for the West Indian manatee would occur within the tow route or at Port of Mobile shipyard facilities.

Potential Occurrence within the Port of Mobile and Transportation Route. Manatees are found in coastal marine, brackish, and freshwater habitats. They are typically found in seagrass beds, canals, creeks, embayments, and lagoons near the mouths of rivers and sloughs (Lefebvre et al., 2001). Habitat selection is influenced by food, water temperatures, and freshwater resources. This species is highly dependent on submerged aquatic vegetation (Laist et al., 2013; Runge et al., 2015). Within Mobile Bay, they are known to occur throughout the bay system that supports adequate foraging resources. Manatees are frequently reported in Dog River, a river emptying into Mobile Bay. A group of manatees were most recently sighted in Dog River in June 2018 (DOT & Alabama Department of Transportation, 2019). The mouth of Dog River is approximately 10 mi. south of shipyard facilities at the Port of Mobile. For more than a decade, Dauphin Island Sea Lab Alabama (2021) has reported dozens of manatee sightings in and around Mobile Bay each year. In recent years, there have been occasional confirmed reports of manatees remaining along the Mississippi-Alabama coast from mid-November to March, and (Cloyed et al., 2021) speculate that may be evidence of climate change-related range shifts. Because the portion of the Mobile River that passes through shipyards has a long history of dredging and shoreline modification, adequate habitat is not present in shipyard locations. Therefore, if a West Indian manatee were to occur within the project area, it would be extremely rare.

Green Sea Turtle (*Chelonia mydas*) – North Atlantic DPS

The green sea turtle was described previously in Section 3.5.2.1 (Virginia). There is no critical habitat for this species designated within the Port of Mobile shipyard facilities, Mobile Bay, and along the transportation routes to or from the Port of Mobile.

Potential Occurrence within the Port of Mobile and Transportation Route. In the northern Gulf of Mexico, green sea turtles prefer the coastal habitats of southern Texas (e.g., lagoons, channels, inlets, bays), including Texas' Laguna Madre (Renaud et al., 1995). As water temperatures rise from April to June, green sea turtle numbers increase in the continental shelf waters off Galveston Bay and in those waters associated with the continental shelf break northeast of Corpus Christi. However, green turtles occur in greater concentrations in the northeast Gulf of Mexico, from the eastern coast of Louisiana eastward (Louisiana Department of Wildlife and Fisheries, 2004). Green sea turtles are known to occur within Mobile Bay (Handley et al., 2013).

Hawksbill Sea Turtle (*Eretmochelys imbricata*)

Status and Management. The hawksbill sea turtle was originally protected as an endangered species under the Endangered Species Preservation Act of 1966 (35 FR 8491); it remained on the endangered species list with the enactment of the ESA in 1973 (see Table 3.5-1). Hawksbill sea turtles inhabit tropical and subtropical waters of the Atlantic Ocean. The hawksbill is the most tropical of the world's sea turtles, rarely occurring above 35 degrees North latitude (°N) or below 30 degrees South latitude (°S) (Seminoff et al., 2003). Hatchlings are believed to occupy open-ocean waters, associating themselves with surface algal mats (e.g., *Sargassum* mats) in the Atlantic Ocean (NMFS & USFWS, 2013; Seminoff et al., 2003; Witherington & Hirama, 2006). Juveniles leave the open-ocean habitat after three to 10 years and settle in coastal foraging areas, typically in coral reefs, but occasionally in seagrass beds, algal beds, mangrove bays, and creeks (Mortimer & Donnelly, 2008; NMFS & USFWS, 2013). As they mature into adults, hawksbills may move to deeper habitats and forage to depths greater than 295 ft (90 m). As adults, hawksbills are found in waters beyond the continental or insular shelf only when they are in transit between distant foraging and nesting grounds (Renaud et al., 1995; Shaver & Rubio, 2007; Shaver et al., 2005). Hawksbills nest on sandy beaches in tropical and subtropical latitudes (NMFS & USFWS, 2013).

Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat in 1998 for the coastal waters surrounding Mona and Monito Islands, Puerto Rico (63 FR 46693). There is no critical habitat for this species designated within the Port of Mobile shipyard facilities, Mobile Bay, and along the transportation routes to or from the Port of Mobile.

Potential Occurrence within the Port of Mobile and Transportation Route. Nesting is not known to occur on U.S. beaches (Gunter, 1981; NMFS & USFWS, 2013) and would, therefore, not be expected near Mobile Bay. In the Gulf of Mexico, rare hawksbill turtle sightings occur in waters off the Florida Panhandle, Alabama, Mississippi, Louisiana, and Texas (Gunter, 1981; Rester & Condrey, 1996; Seminoff et al., 2003). These individuals are likely the early juveniles born on nesting beaches in Mexico that have drifted north with the dominant currents (NMFS & USFWS, 1993). Hawksbill turtles are more common in the southern Gulf of Mexico and into the Caribbean (NMFS & USFWS, 1993) and are not expected to occur within the project area.

Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)

The Kemp's ridley sea turtle was described previously in Section 3.5.2.1 (Virginia). There is no critical habitat designated for this species.

Potential Occurrence within the Port of Mobile and Transportation Route. In the Gulf of Mexico, the Kemp's ridley occurs year round in coastal waters (Shaver et al., 2016), and some adults never leave the Gulf. The majority of the population nests (April through July) in the Gulf of Mexico, with highest nesting concentrations along a stretch of beaches from southern Texas to the Yucatán peninsula and lower concentrations from Alabama to Florida (NMFS & USFWS, 2015; Shaver et al., 2016). As Kemp's ridley sea turtles migrate from their Gulf of Mexico nesting beaches to their foraging grounds, they tend to remain within 12 mi. (20 km) of the coast in waters no deeper than 164 ft. (50 m) (NMFS & USFWS, 2015; Shaver et al., 2016). Foraging "hot spots" for females exist within the Gulf of Mexico from Texas through Mississippi, especially off Louisiana (NMFS & USFWS, 2015).

Kemp's ridley sea turtles are the most common turtles in the waters of Alabama (Raines, 2010). They are also known to nest on Alabama beaches, although nesting is more common elsewhere in the Gulf of Mexico (Guyer et al., 2015). Mobile Bay is an important foraging ground for Kemp's ridley sea turtles, especially juvenile turtles (Handley et al., 2013; Raines, 2010).

Leatherback Sea Turtle (*Dermochelys coriacea*)—Northwest Atlantic DPS

The leatherback sea turtle was described previously in Section 3.5.2.1 (Virginia). There is no critical habitat for this species designated within the Port of Mobile shipyard facilities, Mobile Bay, and along the transportation routes to or from the Port of Mobile.

Potential Occurrence within the Port of Mobile and Transportation Route. In the Gulf of Mexico, leatherback sea turtles regularly inhabit deep offshore waters, especially between Mississippi and DeSoto Canyon (off Alabama and the Florida panhandle) for feeding, resting, and migrating (Davis et al., 2000; Landry & Costa, 1999). Leatherback sea turtles also may occur in shallow waters on the continental shelf and have been observed feeding on dense aggregations of jellyfish in nearshore waters off the Florida Panhandle, the Mississippi River Delta, and the Texas coast (Collard, 1990).

Both stranded and foraging adult leatherback sea turtles have been observed in Alabama waters, although rarely (Guyer et al., 2015). There is a possibility of nesting on Alabama beaches, although nesting activity has not been confirmed within the state (Guyer et al., 2015). The National Centers for Environmental Information's (2014) *Gulf of Mexico Data Atlas* indicates that Mobile Bay's shores are only marginally suitable nesting habitat for leatherback sea turtles. Leatherbacks rarely occur within Mobile Bay.

Loggerhead Sea Turtle (*Caretta caretta*)—Northwest Atlantic Ocean DPS

The loggerhead sea turtle was described previously in Section 3.5.2.1 (Virginia). NMFS designated critical habitat (nearshore reproductive habitat) along Gulf coastal beaches near the mouth of Mobile Bay; however, the navigation channel for ship traffic into Mobile Bay does not overlap with the critical habitat designation.

Potential Occurrence within the Port of Mobile and Transportation Route. In the Gulf of Mexico, loggerhead sea turtles can be found during all seasons in both continental shelf and slope waters (Conant et al., 2009; Davis et al., 2000). Nesting is infrequent in this region, and juvenile loggerheads appear to primarily use the developmental habitats found in the northwestern Gulf, including coastal inlets, sounds, bays, estuaries, and lagoons with depths less than 328 ft. (100 m) (Bolten, 2003; Bowen et al., 1995; Musick & Limpus, 1997; Pitman, 1990; Zug et al., 1995). The occurrence of loggerhead sea

turtles during winter is likely concentrated in the northeastern Gulf; in Alabama and Florida Panhandle shelf waters; and, to a lesser extent, in the deeper off-shelf waters from Texas to Florida. Loggerhead sea turtles are known to occur within Mobile Bay (Guyer et al., 2015; Handley et al., 2013).

3.5.2.3 Texas

The areas considered for analysis for potential impacts on biological resources within Texas include the location of the commercial facilities in the Port of Brownsville where commercial dismantlement could occur. As described in Chapter 2 (Description of Proposed Action and Alternatives) and shown in Figure 2-7, dismantlement activities would occur in heavily industrialized portions of the Port of Brownsville. Dismantlement activities would not require new infrastructure and would occur within the existing industrialized footprint of the Port of Brownsville.

As part of the literature review to describe the affected environment for biological resources, the Navy reviewed previous NEPA documentation that assessed impacts within the Brownsville Ship Channel; State of Texas Natural Diversity Database queries for the ship channel and Cameron County, Texas; and available literature describing the general ecology of the area.

The Brownsville Ship Channel is an artificial, man-made ship channel that was completed in 1936 and connects the Port of Brownsville to the Brazos Santiago Pass. It was subsequently dredged several more times becoming progressively deeper to accommodate larger ships. Dredged material from past activities has been placed along either side of the channel, effectively isolating many of its previous connections to the Laguna Madre, Bahia Grande, and South Bay (Shelton & Webb, 2009). As such, precipitation is the main source of freshwater input in the channel. As a result of the limited freshwater input and small tidal exchange from the Gulf of Mexico, the Brownsville Ship Channel has high salinity levels and experiences episodes of low DO due to its being a dead-end channel with little freshwater inflow, low velocities, and low tidal exchange (Kowalski et al., 2018). The salinity levels at the Port of Brownsville range between 34 and 37 ppt (NMFS, 2019). For context, the average ocean salinity is 35 ppt (Digiantonio et al., 2020).

Open-water habitat within the Brownsville Ship Channel adjacent to Port of Brownsville commercial facilities are consistently submerged, unlike wetlands or tidal flats where water levels are influenced by rainfall or tides. Typical bird species include osprey (*Pandion haliaetus*), herring gull (*Larus smithsonianus*), laughing gull (*Leucophaeus atricilla*), and brown pelican (*Pelecanus occidentalis*). There are no known nests of bald eagles within Cameron County, Texas, and any bald eagles within the project area would be considered transients and rare.

The Brownsville Ship Channel is considered a saltwater fishery by the Texas Parks and Wildlife Department (2019). Commercial fisheries in the area include eastern oysters as well as penaeid shrimp. For commercial shrimping purposes, the lower Laguna Madre, including the Brownsville Ship Channel, is considered a bait bay, where a boat licensed as a commercial bait shrimp boat is used inside waters of the state for taking bait shrimp for pay, barter, sale, or exchange. Specifically identified bait bay, including the Brownsville Ship Channel are not considered nursery areas that serve as major growth and development environments for post larval and juvenile shrimp (Texas Parks and Wildlife Department, 2019).

Invasive aquatic species are of a high concern in the state of Texas and the Texas Parks and Wildlife restricts the importation and possession of approximately 600 species of fishes, shellfishes, and aquatic plants. Boaters in the state are required by law to remove all harmful plants and animals from boats and

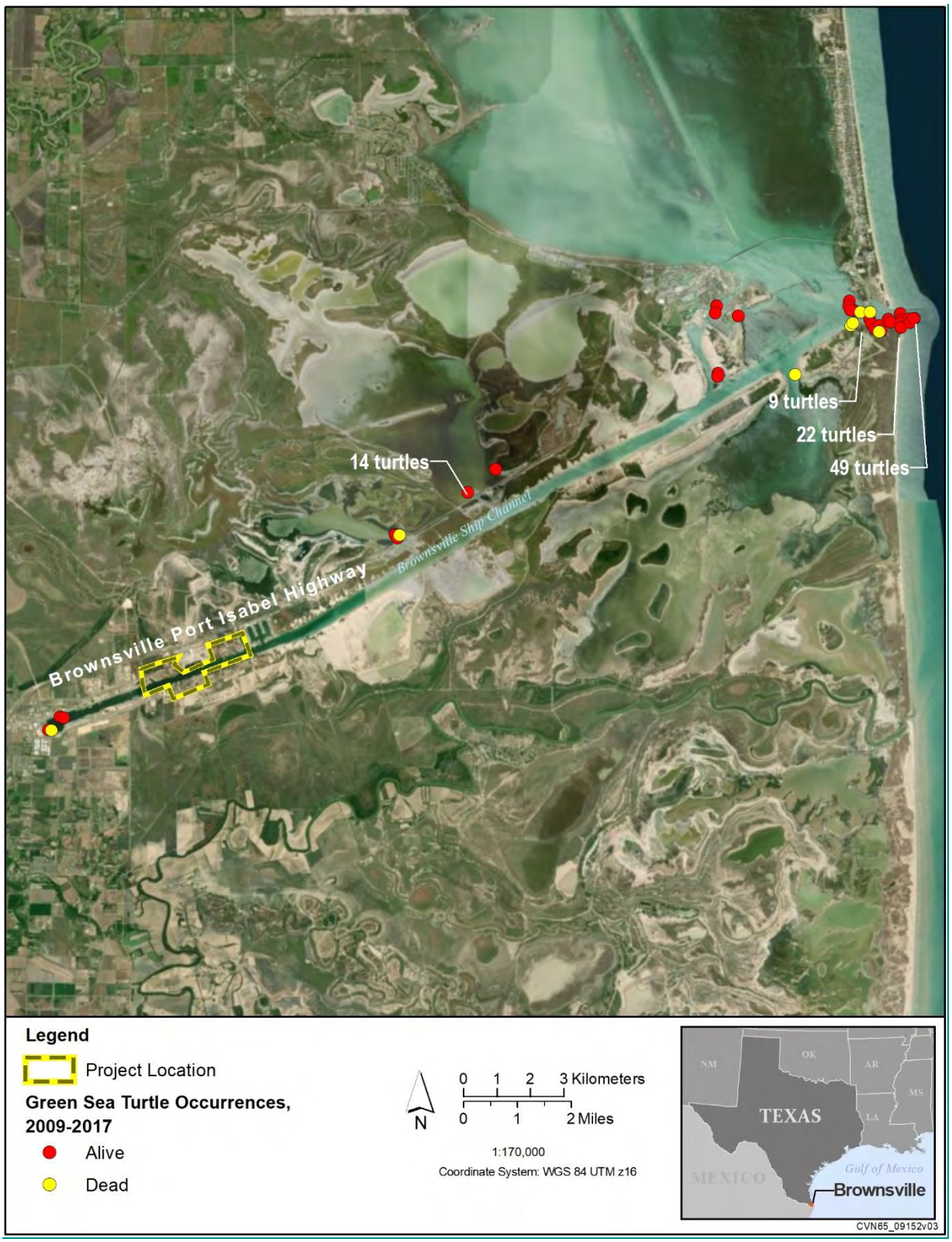
trailers before leaving the vicinity of a lake, river, or bay. The two species of the greatest concern are zebra mussels and giant salvinia (NMFS, 2019).

Based on review of potential ESA-listed species within the Brownsville Ship Channel, the Navy determined that only the green sea turtle would have the potential to occur within the entry and exit routes of the ship channel. The Navy determined that other ESA-listed species, such as the jaguarundi, the ocelot, and the West Indian manatee would not occur within the ship channel, and therefore are not considered for analysis.

Green Sea Turtle (*Chelonia mydas*) – North Atlantic DPS

The green sea turtle was described previously in Section 3.5.2.1 (Virginia). There is no critical habitat for this species designated within the Port of Brownsville or Brownsville Ship Channel.

Potential Occurrence within the Brownsville Ship Channel. The green sea turtle (North Atlantic DPS) is known to occur within the Brownsville Ship Channel (Figure 3.5-6) (NMFS, 2019; Texas Natural Diversity Database, 2020). Figure 3.5-6 shows individual green sea turtles in and around the Brownsville Ship Channel, as reported in the 2019 NMFS Programmatic Biological Opinion. Because of the habitat and water quality conditions (e.g., high salinity and low DO levels) reported in the vicinity of the Port of Brownsville, occurrences of green sea turtles within the western portions of the Brownsville Ship Channel (where facilities are located) should be considered rare.



Note: Adapted from NMFS (2019)

Figure 3.5-6: Green Sea Turtle Occurrences Within the Brownsville Ship Channel, Texas

3.5.2.4 Washington

The areas considered for analysis of potential impacts on biological resources within Washington include PSNS & IMF, the transportation route from PSNS & IMF up the Columbia River to the Port of Benton barge slip, and the land transport route from the barge slip to the final disposal location at the DOE Hanford Site. The following sections describe the affected environment potentially impacted by proposed activities in these areas.

3.5.2.4.1 Puget Sound Naval Shipyard & Intermediate Maintenance Facility and Sinclair Inlet

PSNS & IMF is located on Sinclair Inlet in Puget Sound, bordered on the west by the Bremerton Annex of Naval Base Kitsap, and on the north and east by the city of Bremerton, Washington. Although the area is heavily industrialized with a long history of ship building and maintenance dating back to 1891, the facility supports important biological resources within port facilities (Navy, 2018a).

In support of this EIS/OEIS, the Navy completed a literature review to accurately describe biological resources potentially affected by the proposed activities described in Chapter 2 (Description of Proposed Action and Alternatives). Primary sources of information used for this literature review for the vicinity of PSNS & IMF included online searches for published studies and technical reports on biological resources in the project area, online queries of regulatory databases such as the USFWS Environmental Conservation Online System, the most recent INRMP for Naval Base Kitsap (Navy, 2018a), and the most recent status reviews and recovery plans for ESA-listed species. The results of this literature review are summarized below:

In 2012, the Navy prepared an Environmental Assessment (EA), *Final Environmental Assessment on the Disposal of Decommissioned Defueled Naval Reactor Plants from USS ENTERPRISE (CVN 65)*, for the disposal of decommissioned, defueled naval reactor plants from ex-Enterprise. In this document, the Navy analyzed potential impacts on biological resources resulting from ex-Enterprise single reactor compartment packaging at PSNS & IMF (Navy & DOE, 2012).

In addition, the recent INRMP for Naval Base Kitsap provided descriptions of the general biotic environment.

Representative fish species that occur within PSNS & IMF include (but is not limited to) the following (Navy, 2018a):

- English sole (*Parophrys vetulus*)
- rock sole (*Lepidopsetta bilineata*)
- lingcod (*Ophiodon elongatus*)
- starry flounder (*Platichthys stellatus*)
- Pacific tomcod (*Microgadus proximus*)
- shiner perch (*Cymatogaster aggregata*)
- pile perch (*Rhacochilus vacca*)
- Pacific herring (*Clupea pallasii*)

Depending on the time of the year, the nearshore littoral zone within the project area is generally dominated by shiner perch and juvenile salmon, with the open water dominated by juvenile salmon, forage fish, and threespine stickleback (*Gasterosteus aculeatus*). Some ESA-listed fishes have the potential to occur in the project area, such as the Southern DPS of green sturgeon (*Acipenser*

medirostris) and the Southern DPS of Pacific eulachon (*Thaleichthys pacificus*), but their occurrence would be rare to infrequent. Pacific eulachon occur within Puget Sound, but are at very low abundance relative to coastal waters, and typically occupy very deep waters (74 FR 10857). With respect to green sturgeon distribution within the inland waters, two tagged southern DPS green sturgeon originating from San Pablo Bay were detected south of Whidbey Island in 2006 (Moser et al., 2021), one of which was detected over a two-year period in the area. However, from 2008 to 2019, no southern DPS green sturgeon were detected in central or south Puget Sound (Moser et al., 2021). Therefore, these species are not discussed further.

The industrial nature of PSNS & IMF limits the suitable habitat for bird species, though many species of birds can be seen in Sinclair Inlet at different times of the year (Navy, 2018a). Representative species of birds that can be seen in Sinclair Inlet include, but may not be limited to the following:

- scaup (*Aythya* spp.)
- ring-necked duck (*Aythya collaris*)
- Caspian tern (*Hydroprogne caspia*)
- surf scoter (*Melanitta perspicillata*)
- white-winged scoter (*Melanitta deglandi*)
- American wigeon (*Anas americana*)
- Canada goose (*Branta canadensis*)
- mallard (*Anas platyrhynchos*)
- common goldeneye (*Bucephala clangula*)
- merganser (*Mergus* spp.)
- bufflehead (*Bucephala albeola*)
- glaucous-winged gull (*Larus glaucescens*)
- mew gull (*Larus canus*)
- western grebe (*Aechmophorus occidentalis*)
- double-crested cormorant (*Phalacrocorax auritus*)
- Pacific loon (*Gavia pacifica*)
- American coot (*Fulica americana*)
- pigeon guillemot (*Cepphus columba*)

Birds of prey include bald eagles (*Haliaeetus leucocephalus*) and ospreys. Currently, there is one bald eagle nest located at Navy Base Kitsap Bremerton (adjacent to PSNS & IMF), situated approximately 400 m from the shoreline.

Marine mammal species that have been observed in the vicinity of PSNS & IMF include the following (Navy, 2018a):

- Pacific harbor seal (*Phoca vitulina*)
- California sea lion (*Zalophus californianus*)
- gray whale (*Eschrichtius robustus*)
- Dall's porpoise (*Phocoenoides dalli*)

- harbor porpoise (*Phocoena phocoena*)
- Southern Resident killer whale (*Orcinus orca*)
- Steller sea lion (*Eumetopias jubatus*)
- Humpback whale (*Megaptera novaeangliae*)

California sea lions and harbor seals are known to utilize the Naval Base Kitsap Bremerton Port Security Barrier and, on rare occasions, use submarine hulls as haulouts.

Appendix H (ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes) lists the ESA-listed species that are known to occur within PSNS & IMF project area. These species and their potential occurrence within PSNS & IMF are summarized below.

Chinook Salmon (*Oncorhynchus tshawytscha*) – Puget Sound ESU

Status and Management. As indicated in Table 3.5-1, NMFS determined the Puget Sound Chinook Salmon ESU is threatened under the Endangered Species Act (64 FR 14308). This regulatory status was reaffirmed on June 28, 2005 (70 FR 37160), and subsequently updated on April 14, 2014 (79 FR 20802). This ESU includes naturally spawned Chinook salmon originating from rivers flowing into Puget Sound from the Elwha River (inclusive) eastward, including rivers in Hood Canal, South Sound, North Sound, and the Strait of Georgia, and 25 artificial propagation (hatchery) programs (79 FR 20802). In 2016, NMFS issued a proposed rule to remove two and add two hatchery programs to this ESU (81 FR 72759). Thus, if the hatchery ruling is finalized as currently proposed, the total number of listed hatchery programs for this ESU would not change.

In response to the current threats facing this ESU, NMFS (2007) developed goals to recover Puget Sound Chinook salmon populations, those goals focus on abundance, productivity, spatial distribution and diversity at both the population and ESU levels. NMFS (2007) provides complete downlisting/delisting criteria for these recovery goals.

Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat for this ESU in 2006 (70 FR 52629). Within Sinclair Inlet, designated critical habitat has been confined to a narrow nearshore zone from the line of extreme high tide down to the line of mean lower low water (Figure 3.5-7). However, DoD easements or right-of-ways adjacent to the Bremerton waterfront were excluded from critical habitat designation.

Potential Occurrence in the PSNS & IMF Project Area. The majority of Puget Sound Chinook salmon found in Sinclair Inlet are estimated to be of hatchery origin from facilities in Gorst Creek, with smaller numbers (approximately 10 percent) estimated to have naturally spawned in Sinclair Inlet area streams, and the remainder coming from other hatchery populations (City of Bremerton, 2012; Fresh et al., 2006). Juvenile Chinook likely use littoral habitats in Sinclair Inlet from early spring through early fall, with both hatchery and wild juveniles foraging along Sinclair shorelines during late spring and summer (Fresh et al., 2006).



Figure 3.5-7: Critical Habitat Designations for ESA-Listed Fishes Chinook Salmon and Steelhead Within Puget Sound Naval Shipyard and Intermediate Maintenance Facility

Steelhead (*Oncorhynchus mykiss*) – Puget Sound DPS

Status and Management. As indicated in Table 3.5-1, NMFS determined the Puget Sound steelhead DPS is threatened under the Endangered Species Act (72 FR 26722). The Puget Sound steelhead DPS regulatory status was updated on April 14, 2014 (79 FR 20802). This DPS includes naturally spawned steelhead originating below natural and manmade impassable barriers from rivers flowing into Puget Sound. This includes the Elwha River and rivers in Hood Canal, South Sound, North Sound, and the Strait of Georgia. No naturally spawning or hatchery-reared steelhead originate from the Gorst Creek watershed. In 2019, NMFS finalized the recovery plan for Puget Sound steelhead with a goal of providing guidance to recover the species to the point that it can be naturally self-sustaining over the long term (NMFS, 2020).

Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat for Puget Sound steelhead DPS in 2016 (81 FR 9251). Critical habitat includes approximately 2,031 mi. (3,269 km) of freshwater and estuarine habitat in Puget Sound. Critical habitat for this DPS does not occur in the project area (see Figure 3.5-7).

Potential Occurrence in the PSNS & IMF Project Area. Puget Sound steelhead likely swim through the project area to utilize Gorst and Blackjack Creek watersheds as refuge habitat (City of Bremerton, 2012; Fresh et al., 2006). The Washington Department of Fish and Wildlife (1994) identified that a small, distinct stock of naturally spawning Puget Sound steelhead utilize tributaries of Sinclair Inlet. In addition, a distinct stock of steelhead exists in the Sinclair Inlet based on the geographical isolation of the spawning population in tributaries (Washington Department of Fish and Wildlife, 1994).

Bull Trout (*Salvelinus confluentus*) – Coastal Puget Sound DPS

Status and Management. As indicated in Table 3.5-1, USFWS determined all bull trout populations in the coterminous United States are threatened under the ESA (64 FR 58910). The Coastal-Puget Sound DPS of bull trout encompasses all Pacific Coast drainages within the United States north of the Columbia River in Washington, including those flowing into Puget Sound. This DPS is considered to contain the only anadromous forms (migrates up rivers to spawn) of bull trout in the United States. The 2015 Bull Trout Recovery Plan (USFWS, 2015a) provides a summary of the description and current status of bull trout within the six Recovery Units, as well as individual Recovery Unit implementation plans.

Critical Habitat. As indicated in Table 3.5-1, USFWS designated critical habitat for this DPS in 2010 (75 FR 63898). Critical habitat for this DPS does not occur in the project area.

Potential Occurrence in the PSNS & IMF Project Area. Even though ESA-listed bull trout do not utilize any of the drainages on the east side of Kitsap Peninsula due to a lack of suitable spawning habitat, this species could overwinter or forage in Sinclair Inlet (USFWS, 2015b) and could be found infrequently in the project area.

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

Status and Management. As indicated in Table 3.5-1, NMFS determined the bocaccio is endangered under the ESA (75 FR 22276). Bocaccio occupy the waters of the Pacific coast from California to Alaska. However, there appears to be little correspondence between age structure of bocaccio inside and outside of Puget Sound region, resulting in the determination of a unique Puget Sound/Georgia Basin DPS. Juvenile bocaccio have never been documented within Puget Sound, likely due to habitats that feature rock and macroalgae (kelp species) used by juvenile bocaccio along the coast are limited within central and south Puget (Palsson et al., 2009). NMFS published a recovery plan for the DPS in 2017 that

outlines actions and research for the conservation and survival of bocaccio using the best available science (NMFS, 2017).

Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat for this DPS in 2014 (79 FR 68041). The specific areas in the final designation include 590.4 square miles (1,529 square km) of nearshore habitat and 414.1 square miles (1,072.5 square km) of deepwater habitat in Puget Sound/Georgia Basin. Critical habitat was not designated in the Sinclair Inlet (79 FR 68041).

Potential Occurrence in the PSNS & IMF Project Area. Potential Occurrence in the PSNS & IMF Project Area. Frierson et al. (2016b) found that the habitat (predominantly mud substrate) and depths within the Sinclair Inlet Naval Restricted Area were not consistent with known habitat associations of ESA-listed rockfish species. Similarly, rockfish surveys conducted by the Washington Department of Fish and Wildlife (WDFW) have indicated that some Puget Sound Navy installations may provide suitable habitat for juveniles, but not adults (Frierson et al., 2017a, 2017b, 2017c, 2017d; Frierson et al., 2016a; Frierson et al., 2018; Lowry et al., 2013).

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

Status and Management. As indicated in Table 3.5-1, NMFS determined the yelloweye rockfish is threatened under the ESA (75 FR 22276), which includes yelloweye rockfish throughout Puget Sound. Yelloweye rockfish occupy the same waters as bocaccio (described above). NMFS published a recovery plan for the DPS in 2017 that outlines actions and research for the conservation and survival of bocaccio using the best available science (NMFS, 2017).

Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat for this DPS in 2014 (79 FR 68041). The specific areas in the final designation include 414.1 square mi. (1,072.5 square km) of deepwater habitat in Puget Sound/Georgia Basin. Critical habitat was not designated in the Sinclair Inlet (79 FR 68041).

Potential Occurrence in the PSNS & IMF Project Area. As adult yelloweye rockfish occur in deep waters with high relief rock reef habitats and steep slopes (Palsson et al., 2009), they are not expected to be present in the project area due to a lack of suitable habitat. Rocky substrates are infrequent and patchy in distribution in North Puget Sound and the Georgia Strait, and are very rare in Puget Sound proper (waters east of Admiralty Inlet) (75 FR 22276). Larvae and pelagic juveniles can occur throughout the water column in Puget Sound, with juveniles being observed in deeper, offshore waters greater than 30 m. Due to the lack of deep water, high relief habitats, the only yelloweye rockfish lifestages with the potential to occur in the project area would be larvae and pelagic juveniles. However, due to limited adult female presence in central Puget Sound, and this species being dependent on adult females who livebear their young, the potential for early lifestages of yelloweye rockfish occurring in Sinclair Inlet is very low.

Southern Resident Killer Whale (*Orcinus orca*)

Status and Management. As indicated in Table 3.5-1, NMFS determined the Southern Resident killer whale, a subpopulation of *Orcinus orca*, is endangered under the ESA (70 FR 69903). Factors that are thought to contribute to the decline of the Southern Resident killer whale population include prey availability, human-generated noise, vessel presence/harassment, and toxic chemical contamination.

Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat in 2016 for the Southern Resident killer whale DPS to include portions of the Haro Strait and waters around the San Juan Islands, portions of the Strait of Juan de Fuca, and portions of Puget Sound (71 FR 69054). NMFS identified three

habitat features essential to the conservation of this DPS: (1) water quality to support growth and development; (2) prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth; and (3) passage conditions to allow for migration, resting, and foraging. In 2021, NMFS revised the critical habitat portions outside of Puget Sound and specifically exempted PSNS & IMF from critical habitat (86 FR 41668).

Potential Occurrence in the PSNS & IMF Project Area. While both Southern Resident killer whales and transient killer whales are frequently sighted in the main basin of Puget Sound, their presence near Navy installations varies from not present at all to infrequent sightings, depending on the season (Olson & Osborne, 2017). The last confirmed sighting of a Southern Resident killer whale was in 1997 in Dyes Inlet (to the north of Sinclair Inlet) (NMFS, 2020).

Humpback Whale (*Megaptera novaeangliae*) – Mexico DPS and Central America DPS

Status and Management. The humpback whale is an endangered species originally protected under the Endangered Species Preservation Act of 1966; it remained on the endangered species list with the enactment of the ESA in 1973 (see Table 3.5-1). In 2016, NMFS published a final decision changing the status of humpback whales under the ESA to list the Mexico DPS as endangered and the Central America DPS as threatened (81 FR 62260). During the summer, humpback whales in the North Pacific migrate and feed over the continental shelf and along the coasts of the Pacific Rim, from Point Conception, California, to the Gulf of Alaska, Prince William Sound, and Kodiak Island. Humpback whales in the Strait of Juan de Fuca, Puget Sound, and other parts of the Salish Sea are increasing (Cascadia Research, 2017; Cogan, 2015).

Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat for the humpback whale Mexico DPS, Central America DPS, and Western North Pacific DPS in 2021 (79 FR 68041). Critical habitat for the humpback whale Mexico DPS has not been designated in the vicinity of Puget Sound (86 FR 21082).

Potential Occurrence in the PSNS & IMF Project Area. Humpback whales (Mexico DPS and Central America DPS) are considered rare visitors in the Sinclair Inlet near PSNS & IMF.

Marbled Murrelet (*Brachyramphus marmoratus*)

Status and Management. As indicated in Table 3.5-1, USFWS determined the marbled murrelet is threatened under the ESA (57 FR 45328). Marbled murrelets range from the Aleutian Archipelago in Alaska to central California. The majority of their lives are spent in the marine environment within 1.6 mi. of shore, where they feed primarily on small fish such as Pacific sand lance and Pacific herring. Marbled murrelets nest in inland forests, typically in old critical habitat growth forests.

Critical Habitat. As indicated in Table 3.5-1, USFWS designated critical habitat in 2016, which established approximately 3,698,100 acres (1,397,000 hectares) of critical habitat in Washington, Oregon, and California (81 FR 51348). No critical habitat has been designated within the project area.

Potential Occurrence in the PSNS & IMF Project Area. Marbled murrelets forage in the nearshore waters of Puget Sound. The Navy supports survey and monitoring efforts for ESA-listed marbled murrelets and other protected wildlife species in the vicinity of Naval Base Kitsap Bremerton. Since 2013, WDFW has conducted at-sea surveys for marbled murrelets during fall to spring months in the vicinity of several Puget Sound installations including Naval Base Kitsap Bremerton. Murrelets have not been observed within the Inlet project area (Navy, 2018b).

3.5.2.4.2 Port of Benton Barge Slip

The Port of Benton barge slip is on the northern end of Lake Wallula, which is the Columbia River impoundment created by McNary Dam, and is located on the west shoreline of the Columbia River at river mile 342.8 (Figure 3.5-8). Forty-six fish species are known to reside in or migrate through Upper Lake Wallula (DOE, 2017b). Of these species, Chinook salmon, sockeye salmon, coho salmon, steelhead, and bull trout use the river as a migration route to and from upstream spawning areas and are of the greatest economic importance. Adult and juvenile Pacific lamprey (*Entosphenus tridentatus*) also migrate through Upper Lake Wallula. In addition to fall Chinook salmon, other species of fish are culturally and recreationally important, such as white sturgeon (*Acipenser transmontanus*), smallmouth bass (*Micropterus dolomieu*), walleye (*Sander vitreus*), and mountain whitefish (*Prosopium williamsoni*) (DOE, 2017b).

Beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), mink (*Mustela vison*), and river otter (*Lontra canadensis*) occur in both riparian and aquatic habitats along the Columbia River. Although the location of the Port of Benton barge slip does not contain suitable cover for these mammals, they likely transit and possibly forage through the area (DOE, 2017b).

Aquatic invasive species along this reach of the Columbia River may include nonindigenous mollusks (red-rimmed melania [*Melanoides tuberculata*], faucet snail [*Bithynia tentaculata*], New Zealand mudsnail [*Potamopyrgus antipodarum*]), plants (Eurasian watermilfoil [*Myriophyllum spicatum*], flowering rush [*Butomus umbellatus*], and curly-leaf pondweed [*Potamogeton crispus*) (Upper Columbia Conservation Commission, 2021). Juvenile salmonids are also consumed by nonindigenous fishes, including walleye, smallmouth bass, and channel catfish. Both the Oregon and Washington Departments of Fish and Wildlife have removed size and bag limits for these species in their sport fishing regulations in an effort to reduce predation pressure on juvenile salmonids. ESA-listed species found in the vicinity of the project area include Chinook salmon (Upper Columbia River Spring-run ESU), steelhead (Upper Columbia River and Middle Columbia River DPS), and bull trout (Columbia River DPS) (USFWS, 2020b) (Figure 3.5-8). Additional details for each ESA-listed species in the project area are presented below.

Chinook Salmon (*Oncorhynchus tshawytscha*) – Upper Columbia River Spring-Run ESU

Status and Management. As indicated in Table 3.5-1, NMFS determined the Upper Columbia River spring-run Chinook salmon ESU is endangered under the ESA (64 FR 14308). This status was reaffirmed on June 28, 2005 (70 FR 37160), and subsequently updated on April 14, 2014 (79 FR 20802). This ESU includes naturally spawned spring-run Chinook salmon originating from Columbia River tributaries upstream of the Rock Island Dam and downstream of Chief Joseph Dam (excluding the Okanogan River subbasin) as well as salmon from six artificial propagation programs (79 FR 20802). In 2007, NMFS finalized a recovery plan for this ESU to secure long-term persistence of viable populations of naturally produced spring Chinook distributed across their native range (NMFS, 2007). In 2016, NMFS issued a proposed rule to remove one and add one hatchery program to this ESU (81 FR 72759).

Designated Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat for this ESU in 2006 (70 FR 52629), which includes those areas that contain physical and biological features essential for the conservation of the species or that require special management considerations (70 FR 52629) (Figure 3.5-8).



Figure 3.5-8: Critical Habitat Designations Within the Port of Benton Barge Slip Project Area for ESA-Listed Fishes

Potential Occurrence in the Port of Benton Barge Slip Project Area. Juvenile spring-run Chinook may be present in the barge slip area during late spring (late April through July), using shallow vegetated habitat downstream of the barge slip for rearing and migration. However, vegetation and the near shore juvenile salmonid rearing habitat at the barge slip has been heavily impacted by previous management actions associated with the development of the existing barge slip, and riparian plant communities at the barge slip are sparsely distributed (Navy, 2019). In contrast, adults generally utilize deeper water in the main channel of the river during upstream migrations.

Steelhead (*Oncorhynchus mykiss*) – Upper Columbia River DPS and Middle Columbia River DPS

Status and Management. As indicated in Table 3.5-1, NMFS determined the Upper Columbia River steelhead DPS is threatened under the ESA (62 FR 43937), and its status was reaffirmed in 2005 (70 FR 37160). The DPS was reclassified as a threatened species in 2009 (74 FR 42605), consistent with a recent court ruling, and the status was subsequently updated on April 14, 2014 (79 FR 20802). NMFS also determined in 1999 that the Middle Columbia River steelhead DPS is threatened under the ESA (64 FR 14517), and its status was updated on January 5, 2006 (71 FR 834) and April 14, 2014 (79 FR 20802).

The Upper Columbia River steelhead DPS includes all naturally spawned steelhead populations below natural and manmade impassable barriers in streams in the Columbia River basin upstream from the Yakima River, Washington, to the U.S.-Canada border, and progeny of six artificial propagation programs (79 FR 20802). The Middle Columbia River steelhead DPS includes all naturally spawned steelhead populations below natural and artificial impassable barriers in streams from above the Wind River, Washington; and the Hood River, Oregon (exclusive), upstream to, and including, the Yakima River, Washington, excluding steelhead from the Snake River basin (79 FR 20802), and progeny of seven artificial propagation programs (Hargrove et al., 2019).

Designated Critical Habitat. As indicated in Table 3.5-1, NMFS designated critical habitat for these DPSs in 2006 (70 FR 52629), which includes known physical and biological features (primary constituent elements or PCEs) within the occupied areas that are essential to the conservation of the species (70 FR 52629) (see Figure 3.5-8).

Potential Occurrence in the Port of Benton Barge Slip Project Area. As described above for Upper Columbia River spring-run Chinook, juvenile steelhead may be present in the project area during late spring (late April through July), using shallow vegetated habitat downstream of the barge slip for rearing and migration. However, aquatic vegetation and the nearshore juvenile salmonid rearing habitat at the barge slip has been heavily impacted by previous management actions associated with the development of the existing barge slip and riparian plant communities at the barge slip are sparsely distributed. Adult steelhead likely use other habitat in the vicinity of the project area such as the deeper channels during their upstream migration.

Bull Trout (*Salvelinus confluentus*) – Columbia River DPS

Status and Management. As with the Coastal Puget Sound DPS discussed previously in Section 3.5.2.4.1 (Puget Sound Naval Shipyard & Intermediate Maintenance Facility and Sinclair Inlet), bull trout within the Columbia River DPS were listed as threatened in 1999 (63 FR 31647). A summary of the description and current status of bull trout within the six Recovery Units is provided in the Bull Trout Final Recovery Plan (USFWS, 2015a), as well as individual Recovery Unit implementation plans.

Bull trout are divided into five DPSs, with each DPS further divided into recovery units. Bull trout in the Port of Benton barge slip project area are within the Mid-Columbia River Recovery Unit (USFWS, 2015a), which is divided into the following four geographic regions:

- the Lower Mid-Columbia which includes all core areas that flow into the Columbia River below its confluence with the Snake River (i.e., the John Day, Umatilla, and Walla Walla basins)
- the Upper Mid-Columbia which includes all core areas that flow into the Columbia River above its confluence with the Snake River (i.e., the Yakima and all other basins north to the Canadian border)
- the Lower Snake which includes all core areas that flow into the Snake River between its confluence with the Columbia River and Hells Canyon Dam (i.e., the Clearwater, Tucannon, Asotin, Grande Ronde, and Imnaha basins)
- the Mid-Snake which includes all core areas in the Mid-Columbia Recovery Unit that flow into the Snake River above Hells Canyon Dam (i.e., the Powder basin; Pine, Indian and Wildhorse Creeks) (USFWS, 2015a)

Designated Critical Habitat. Critical habitat for this DPS was designated in 2005 and revised in 2010, which includes PCEs within the occupied areas that are essential to the conservation of the species (75 FR 63898). The barge slip area falls within the critical habitat for bull trout (USFWS, 2015a) (see Figure 3.5-8).

Potential Occurrence in the Port of Benton Barge Slip Project Area. Adult bull trout may be present near the project area and would primarily be found transiting through the project area in winter, moving from and returning to upper tributaries during migrations (Navy, 2019).

Essential Fish Habitat

EFH designated within the vicinity of the Port of Benton barge slip is under the jurisdiction of the Pacific Fishery Management Council. No HAPC were identified at this location. Designated EFH for Chinook and coho salmon is within the Columbia River channel portion that runs through this project area (Pacific Fishery Management Council, 2021). As described under Section 3.5.3.3 (Alternative 2: Dual Reactor Compartment Packages), in-water construction activities at the Port of Benton barge slip would only occur under Alternative 2. The Navy would consult with NMFS for potential impacts on EFH within the Port of Benton barge slip project area if the Navy selects Alternative 2 as its Preferred Alternative. Currently, the Navy has selected Alternative 3 as the Preferred Alternative. Potential impacts on the EFH present at the Port of Benton barge slip project area are described in Section 3.5.3.3.4 (Port of Benton Barge Slip Modifications).

3.5.2.4.3 Land Transport Route from the Port of Benton Barge Slip to Final Disposal Location at the Department of Energy Hanford Site

The Navy uses the DOE Hanford Site road systems to transport decommissioned, defueled reactor compartment packages from the Port of Benton barge slip to Trench 94 in the 200 East Area. Current packages range between 1,000 and 1,680 tons. The Navy may require upgrades at 11 locations on the transport route to support dual reactor compartment packages weighing up to 3,304 tons, as discussed in Section 2.3.3.7 (Road Improvements Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site) and shown in Figure 2-16.

As part of the literature review for potential biological resources within areas subject to road improvements, the Navy consulted the DOE Hanford Site Biological Resources Management Plan (DOE,

2017b). In 2018, the Navy completed an ecological review of the transport route in support of the road improvements (DOE, 2018b).

The proposed infrastructure improvements would stretch from the central to the southeast portions of the DOE Hanford Site and the adjacent DOE Office of Science site. The project is within the low-elevation Columbia Basin that covers the arid interior of eastern Washington, extending west to the Cascade Mountains, north to the Okanogan Valley, and south into portions of north-central Oregon. Prior to the early 1940s, the primary biological impacts on the DOE Hanford Site resulted from agricultural development, irrigation system construction, and grazing. The DOE Hanford Site, including undisturbed areas outside of the road corridor, contains some of the largest stands of undisturbed shrub-steppe remaining in the region. Shrub-steppe plant communities occurring on the DOE Hanford Site are typically characterized by shrub overstories interspersed with herbaceous grasses and small woody plants. Representative species include the following:

- species of sagebrush (*Artemisia* spp.)
- bitterbrush (*Purshia tridentata*)
- spiny hopsage (*Grayia spinosa*)
- rabbitbrush (*Ericameria nauseosa* or *Chrysothamnus viscidiflorus*)
- grayball sage (*Salvia dorii*)
- buckwheat (*Eriogonum* spp.)
- bluebunch wheatgrass (*Psuedoregnaria spicata*)
- Sandberg's bluegrass (*Poa secunda*)
- needle-and-thread grass (*Hesperostipa comata*)

The areas adjacent to the proposed transportation route consist of a mosaic of plant community types ranging from industrial areas with scant vegetation and communities dominated by nonindigenous weedy species like cheatgrass to areas dominated by a mixture of nonindigenous species and early successional native species like Sandberg's bluegrass and rabbitbrush, as well as mature communities with a native shrub overstory and either nonindigenous or indigenous grasses in the understory (DOE, 2018b).

Wildlife species anticipated to use or pass through these areas include the following:

- large animals such as Rocky Mountain elk (*Cervus elaphus*) and mule deer (*Odocoileus hemionus*)
- predators such as coyote (*Canis latrans*) and badger (*Taxidea taxus*)
- small herbivores including northern pocket gopher (*Thomomys talpoides*), Nuttall's cottontail rabbit (*Sylvagus nuttallii*), and black-tailed jackrabbits (*Lepus californicus*)

Representative bird species include western meadowlarks (*Sturnella neglecta*), horned larks (*Eremophila alpestris*), common raven (*Corvus corax*), loggerhead shrike (*Lanius ludovicianus*), white-crowned sparrow (*Zonotrichia leucophrys*), and sagebrush sparrow (*Artemisiospiza nevadensis*). Species of reptiles include the side-blotched lizard (*Uta stansburiana*), which occurs in most native upland habitats. It is the most abundant reptile species on the DOE Hanford Site and is likely present along the road corridor. Short-horned (*Phrynosoma douglassii*) and sagebrush lizards (*Sceloporus graciosus*) are also found on the DOE Hanford Site but occur infrequently. The most common snake species include gopher snake (*Pituophis melanoleucus*), yellow-bellied racer (*Coluber constrictor*), and western rattlesnake (*Crotalus viridis*).

The Navy also reviewed the latest available version of the *Bald Eagle Management Plan for the Hanford Site* (DOE, 2017a). This document identifies buffer zones for communal night roosts, perching and forage sites, and nest sites with restrictions on access and aircraft overflights. Bald eagles occupy the Hanford Reach and upper portions of Lake Wallula of the Columbia River primarily during the winter months. They arrive in mid-November to take advantage of the abundance of fall Chinook salmon carcasses that wash up along the Columbia River shoreline, islands, and various flats. The review of buffer restrictions and historic and current nest site locations found no overlap with the land transport route. There are no large trees for roosts, perching, or nesting in the vicinity of the Port of Benton barge slip or along the land transportation route. Bald eagles, however, could forage in the river channel near the barge slip. The closest known nest is 7 mi. downriver in the Yakima Delta and would not be impacted by the project.

There are no ESA-listed plant or animal species anticipated to occur within the road corridor or adjacent area. This has been substantiated through technical ecological studies in the area (DOE, 2018b), and life history information for special status species gathered from the resource management program at the DOE Hanford Site (DOE, 2017b).

3.5.3 Environmental Consequences

This section addresses the potential impacts on biological resources that may result from the activities described in Chapter 2 (Description of Proposed Action and Alternative). Section 3.5.1.4 (Approach to Analysis) describes the Navy's step-wise approach to assessing potential impacts of the Proposed Action and alternatives. Applicable stressors analyzed under each alternative include: (1) stressors associated with in-water hull cleaning, (2) stressors associated with ship strike and tow line strike, (3) stressors associated with ship noise, (4) stressors associated with construction activities at the Port of Benton barge slip, Washington, and (5) stressors associated with ground disturbance associated with the land transport route between the Port of Benton barge slip to Trench 94 at the DOE Hanford Site. To describe these potential impacts, each alternative was broken down into constituent activities that concern construction activities and transportation. By doing so, specific stressors for each alternative are identifiable, and subsequently analyzed potential impacts on habitats, biological processes, and for special status species. These stressors are discussed as applicable under each alternative below. Not all the stressors are applicable to each alternative. For example, only Alternative 2 considers infrastructure improvements.

3.5.3.1 No Action Alternative

As stated in Section 2.3.1 (No Action Alternative), if the Navy selected the No Action Alternative, ex-Enterprise would not be dismantled or disposed of, but rather remain in waterborne storage for an indefinite time period at its current location in Newport News, Virginia. Periodic maintenance would be required to ensure the safe long-term waterborne storage of ex-Enterprise in accordance with the *Maintenance Manual for Inactive Nuclear Powered Ships and Nuclear Support Shops and Service Craft* (Navy, 1995). Storage facility staff would perform periodic inspections and maintenance of the ship while in storage, to include a detailed interior inspection annually, an underwater exterior inspection of the hull after every eight years in waterborne storage, and placing the ship in dry dock for inspection and repair after every 15 years in waterborne storage.

Impacts on biological resources are not likely to occur because hull maintenance would occur within dry dock facilities. Dry dock maintenance avoids potential impacts on the in-water environment of the James River, including adult Atlantic sturgeon during spawning migrations up the James River (and

designated critical habitat) and the seasonal occurrence of sea turtles within the Chesapeake Bay. As such, there would be no applicable stressors on biological resources resulting from indefinitely storing ex-Enterprise at its current mooring location.

3.5.3.2 Alternative 1: Single Reactor Compartment Packages

Alternative 1 is described in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages). Major elements of Alternative 1 are described below, along with their potential impacts on biological resources. Figure 3.5-2 shows the conceptual framework for analyzing potential impacts resulting from Alternative 1.

3.5.3.2.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

As described in Section 2.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility), ex-Enterprise would be towed from its current location at Newport News Shipbuilding in Newport News, Virginia, to one of three commercial locations for partial dismantlement—commercial dismantlement facilities at the Hampton Roads Metropolitan Area, Virginia; the Port of Brownsville, Texas; or the Port of Mobile, Alabama. Towing would be performed by a qualified contractor in accordance with requirements of Appendix H of the *U.S. Navy Towing Manual SI740-AA-MAM-010*, Rev 3, July 2002, as well as Naval Sea Systems Command Instruction 4740.12, *Towing and Preparation for Storage Specification for Inactivated Defueled Nuclear Powered Aircraft Carriers*. The Navy identified in-water hull cleaning activities, ship and tow line strike, and ship noise as potential stressors resulting from initial transport activities. These stressors and potential impacts are analyzed for each project area.

In-Water Hull Cleaning

If the Navy awards a contract to a commercial shipyard facility in the Hampton Roads Metropolitan Area, Virginia, under Alternative 1, transport of ex-Enterprise would be limited to short-distance tows within the area by tug boats. This is a normal activity that would not introduce any additional stressors on biological resources, and in-water hull cleaning would not likely be required because of the short-distance tug operations between Newport News Shipbuilding to nearby shipyard facilities within the Hampton Roads Metropolitan Area.

If the Navy is required to clean the hull of ex-Enterprise prior to initial transport, and if the implementation of hull-cleaning mitigation measures within dry dock is not feasible, the Navy would conduct hull cleaning at the current mooring location in water (Newport News Shipbuilding, Virginia) or at a nearby facility within the Hampton Roads Metropolitan Area. This section analyzes the potential impacts of in-water hull cleaning (if required) based on different scenarios—(1) partial dismantlement of ex-Enterprise at a commercial dismantlement location at or near the current mooring location at Hampton Roads Metropolitan Area, and (2) partial dismantlement of ex-Enterprise at other destination ports (i.e., Port of Mobile, Port of Brownsville).

Ex-Enterprise would be cleaned prior to towing to the Port of Mobile or Port of Brownsville to prevent the spread of nonindigenous species. Because the origination port at Newport News Shipbuilding and the potential destination ports of Brownsville and Mobile are characterized by similar salinity levels, and ESA-listed species are present at the potential destination ports, hull cleaning of ex-Enterprise would be conducted prior to towing for these scenarios.

Risks to biological resources in these areas from in-water hull cleaning include potential increases in turbidity; potential release of copper, zinc, and other contaminants associated with anti-fouling paints;

and depression of DO from the decay of organic matter removed from the hull.[1] These potential risks are summarized below:

- **Turbidity**. In-water cleaning has the potential to increase turbidity levels of the surrounding water. There was only a slight statistical increase in turbidity associated with the hull cleaning of the USS ex-Independence, and levels of turbidity did not exceed water quality standards (Earley et al., 2017b). Similar results would be expected with the cleaning of ex-Enterprise, and any increases in turbidity would be expected to be minor and temporary. Potential effects to biological resources would be limited to momentary behavioral disturbance if an individual happens to co-occur with the single cleaning event and associated turbidity.
- **Release of Copper, Zinc, and Other Metals**. In-water hull cleaning involves the active removal of biofouling organisms and varying amounts of antifouling paint, which can increase localized environmental loading of copper and possibly other metals, such as zinc or lead (Earley et al., 2017a; Forbes, 1996). Copper is toxic to aquatic organisms (mainly dissolved copper due to its bioavailability), so unintended consequences may occur when paint containing copper is discharged as particulates into the water column (Earley et al., 2017a). The main environmental concerns regarding contamination from copper-based antifoulants include the following: (1) bioaccumulation, (2) ecotoxicological effects and subsequent changes to local ecology and biodiversity, and (3) effects on ecosystem function (i.e. microbial and geochemical processes that regulate the cycling, bioavailability, and fate of micro- and macronutrients) (Macleod & Eriksen, 2009). However, all these effects require relatively high concentrations of these metals. While in-water hull cleaning may actively release copper, zinc, and other metal particles over a short time frame, continuous passive leaching from ship hull paint is the primary contributor to ambient toxicity (Earley et al., 2017a). The cleaning of ex-Enterprise, therefore, may have a very minimal effect on metal concentrations in the surrounding waters given that the Hampton Roads Metropolitan Area contains numerous shipyard facilities with high numbers of vessels regularly present. Water quality monitoring associated with the cleaning of active Navy ships has shown elevated water column copper concentrations were limited to an area within 328 ft. (100 m) of the vessel and returned to ambient levels within one to three hours of cleaning (Naval Ocean Systems Center, 1981), so any effects would be highly localized and short lived. Additionally, a comparison of dissolved and particulate composition of copper in hull cleaning waste found 50–80 percent of the total copper to be particulate, and therefore, not bioavailable to organisms in the water column (Valkirs et al., 1994). Zinc levels measured after the cleaning of the ex-Independence were only slightly elevated and did not rise to the level of potential harmful effects to biological resources (Earley et al., 2017b). Accordingly, copper and other metals would not be expected to affect biological resources within the water column. Although effects on water quality may be minimal and short term, metals and other contaminants released during hull cleaning could remain in the sediment for years or decades. However, effects would be highly localized to the area immediately under the vessel during cleaning. A study of effects on sediment contamination was conducted during the hull cleaning of the USS ex-Independence. The study showed that total copper and zinc in the sediment had no statistically significant difference before and after cleaning (Johnston et al., 2018). In considering effects for the programmatic towing of inactive ships, NMFS acknowledged that there may be risk

[1] Underwater hull cleaning meets the requirements of the Clean Water Act under the Uniform Discharge Standards Phase II Batch Two Discharges.

from accumulation of metals over the course of several vessel cleanings, but the risk from a single vessel cleaning was low (NMFS, 2019). As no other inactive Navy ships are planned to be cleaned and towed from Newport News as part of Alternative 1, there is no risk of accumulation associated with the in-water hull cleaning under Alternative 1, and even if marine or aquatic animals were foraging in the vicinity of the shipyard, detrimental effects would not be expected to occur.

- **Dissolved Oxygen**. In addition to heavy metals, the active removal of biofouling organisms from a ship releases organic matter to the immediate aquatic environment. The decay of excess organic matter could result in increases of nutrients, primary productivity (e.g. plankton blooms), and associated decreases in DO. Any biofouling (e.g., algal growth, shellfish) removed from the ship during in-water hull cleaning would be expected to settle quickly to the seafloor. Some biofouling organisms would be expected to survive and reattach to seafloor substrates, whereas some may not survive and undergo biochemical decomposition that could potentially drive increases in nutrients and decreases in DO (Macleod & Eriksen, 2009; Valkirs et al., 1994). A portion of the released organic material would be consumed by other organisms, buffering the effect of organic material release. Based on the post-hull cleaning water quality reports of ex-Independence, the Navy would expect increased nutrient loading to be a short-term effect with levels returning to baseline within a few hours from cleaning. If DO levels are impacted, the impact would likely be short-term and limited to a small area below and immediately adjacent to ex-Enterprise.

For scenarios in which the Navy would implement mitigation measures (i.e., prior to towing to Brownsville or Mobile), the Navy, in accordance with Uniform National Discharge Standards (85 FR 43465), would first give consideration to one of the dry docking mitigation measures (e.g., dry docking long enough to allow species on the hull to "die-off" through desiccation or hull cleaning while the ship is in dry dock). Dry docking would be the first method considered, though this method would only be implemented if there is a sufficiently sized dry dock available during the required timeframe that is in close enough proximity to the origination port to preclude risk of invasive species transfer. In cases where the Navy determines dry docking is not practicable, the Navy would perform in-water hull cleaning (NMFS, 2019). In such cases, organisms and/or biofouling communities attached to the hull would be removed using underwater hull cleaning methods and equipment as specified in NSTM chapter-081, "Waterborne Underwater Hull Cleaning of Navy Ships" (Navy, 2006). This manual provides a description of the various tools; such as diver-operated machines with rotating brushes, either multi-brush or single-brush fitted with different brush types depending on the machine and fouling conditions present. Professional divers would use hand-held or self-propelled rotary equipment (e.g., brushes or waterjets), hand-held water jets and hydro-lance equipment, manual hand tools (e.g., scrapers, pads, and brushes), and other similar industry-recognized equipment. Multi-brush units are used to clean large unobstructed, easily accessible, areas of the hull. These are fitted with rotary cleaning heads (e.g., brushes) that sweep the growth off the hull. The units are typically held against the hull with either a high volume impeller or the suction generated by brush rotation, and ride along the hull on a set of wheels. Single-brush units are held in place by the diver and the suction force generated from the rotating brush, and are used to clean appendages and hull areas that the large multi-brush unit cannot access. For areas that are harder to reach, divers employ high-pressure water jets, hydro-lances, and hand tools (e.g., scrapers, pads and brushes). The NSTM requires divers to inspect the hull and select the appropriate brush for the fouling condition. The primary goal would be to remove fouling safely and efficiently with minimal impact to the underlying hull coating system. The in-water hull cleaning methods are not expected to result in the scraping of all hull areas down to the bare hull. Divers use the least aggressive tools necessary to effectively remove biofouling organism in an attempt

to minimize removal and release of paints and other coatings or damage to the physical integrity of the hull.

In-water hull cleaning of large Navy ships (such as ex-Enterprise) typically occurs over a long period of time (i.e., weeks to months), such that biofouling material would be released slowly over time, allowing it to disperse within the environment. Although in-water hull cleaning can impact levels of DO, turbidity, nitrate, organic debris and dissolved metals in the water column, monitoring studies have shown these conditions to be very temporary, decreasing rapidly to ambient concentrations after cessation of the cleaning activity (NMFS, 2019). A study of effects on water quality was conducted during the hull cleaning of the USS ex-Independence, which indicated there was no evidence of any water or sediment quality parameter exceeding regulatory thresholds and no evidence of persistent water quality impacts (Earley et al., 2017a). Although some parameters increased from the cleaning, all parameters returned to baseline levels and were similar to reference conditions within 40 days after biofouling removal was completed (Earley et al., 2017a). Similar results would be expected with the in-water hull cleaning of ex-Enterprise.

In-water hull cleaning of ex-Enterprise is not expected to measurably change water or sediment quality parameters relative to current conditions at the Hampton Roads Metropolitan Area at Newport News Shipbuilding. Therefore, the Navy concludes that in-water hull cleaning activities that may occur at the current mooring location under Alternative 1 would have minimal impacts on biological resources.

Potential Impacts on ESA-Listed Species. Because of the potential presence of Atlantic sturgeon, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle in the lower portion of the James River, the Navy has determined that in-water hull cleaning of ex-Enterprise may affect these ESA-listed species. Given that in-water hull cleaning would be a single event with a small area affected, the expected low densities of ESA-listed species in the affected area, the measures taken to minimize the effects to water and sediment quality from cleaning, and the industrialized nature of the port of Newport News, the Navy concludes that the effects from in-water hull cleaning activities to ESA-listed Atlantic sturgeon, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle and loggerhead sea turtle would be insignificant (not measurable). In-water hull cleaning would have no effect on the shortnose sturgeon. The Navy also considered potential impacts on critical habitat for the Atlantic sturgeon, which overlaps with the current mooring location of ex-Enterprise and shipyard facilities that may be used for in-water hull cleaning of ex-Enterprise. Based on the analysis for potential water quality impacts above, the Navy anticipates that in-water hull cleaning may affect Atlantic sturgeon critical habitat. The Navy would conduct in-water hull cleaning within work windows when feasible (see Section 3.5.1.3 [Best Management Practices]), thereby further limiting potential impacts on Atlantic sturgeon critical habitat. Given both the temporary and localized impacts anticipated from in-water hull cleaning and working within seasonal restrictions, effects on Atlantic sturgeon critical habitat would be discountable (unlikely to occur).

Potential Impacts on EFH. As described above, in-water hull cleaning typically occurs over a long period of time (i.e., weeks to months), and biofouling material would be released slowly over time, allowing it to disperse within the environment. In-water cleaning would only occur at Newport News Shipbuilding if ex-Enterprise was towed to the Port of Mobile or Port of Brownsville. Although in-water hull cleaning can impact levels of DO, turbidity, nitrate, organic debris and dissolved metals in the water column, monitoring studies have shown these conditions to be very temporary, decreasing rapidly to ambient concentrations after cessation of the cleaning activity (NMFS, 2019). Therefore, the Navy has determined that hull cleaning activities may adversely affect water and substrate quality and biogenic

habitats that serve as EFH and HAPC. However, these impacts are expected to be very minor in severity, short term in duration, and limited in spatial extent to the area immediately under and adjacent to the footprint of the vessel.

Ship and Tow Line Strike

Ship and tow line strike could potentially impact offshore and pelagic (open-ocean) marine organisms along the tow route from Newport News, Virginia, to the selected destination port where partial dismantlement of ex-Enterprise would occur. This section analyzes the potential impacts of ship and tow line strike based on three different scenarios—(1) partial dismantlement of ex-Enterprise at a commercial dismantlement location at or near the current mooring location, (2) partial dismantlement of ex-Enterprise at a commercial dismantlement facility in the Port of Mobile, and (3) partial dismantlement of ex-Enterprise at a commercial dismantlement facility in the Port of Brownsville.

Precise data are lacking for sea turtle mortalities directly caused by ship strikes; however, live and dead turtles are often found with deep cuts and fractures indicative of collision with a boat hull or propeller (Hazel et al., 2007; Lutcavage et al., 1997). Ship-related injuries to sea turtles are more likely to occur in areas with high boating traffic. For example, propeller wounds on loggerhead sea turtles are found often in southeast Florida, from Palm Beach County to Miami-Dade County, likely due to the prevalence of recreational boating in that region (NMFS & USFWS, 2007).

Minor strikes may cause temporary, reversible effects, such as diverting the turtle from its previous activity or causing minor injury. Major strikes are those that can cause permanent injury or death from bleeding/trauma, paralysis and subsequent drowning, infection, or inability to feed. Apart from the severity of the physical strike, the likelihood and rate of a turtle's recovery from a strike may be influenced by its age, reproductive state, and general physical condition. Much of what is published about recovery from ship strikes is inferred from observing individuals some time after a strike. Numerous sea turtles bear scars that appear to have been caused by propeller cuts or collisions with vessel hulls (Hazel et al., 2007; Lutcavage et al., 1997), suggesting that not all vessel strikes are lethal. Conversely, fresh wounds on some stranded animals may strongly suggest a ship strike as the cause of death. The actual incidence of recovery versus death is not known, given available data.

The chance of a ship and tow line strike is extremely remote because of the low probability that a large marine organism would overlap this single towing event. The relatively low speed (less than 10 knots) of the tow further reduces the chance of a ship striking a large whale (Conn & Silber, 2013; Jensen & Silber, 2004; Vanderlaan & Taggart, 2009). The majority of vessel strikes of large whales occur when ships are traveling at speeds greater than approximately 10 knots, with faster, larger ships (80 m or greater), being more likely to cause serious injury or death (Conn & Silber, 2013; Jensen & Silber, 2004; Laist et al., 2001; Vanderlaan & Taggart, 2009). Large ships that transit through shipping channels typically draft close to the bottom of the channel, which increases the likelihood of interactions with bottom-dwelling marine organisms. Vessel strikes of fish are very rare in general and their distribution in the water column further reduces the chance of a strike during a tow to a commercial dismantlement location.

Hampton Roads Metropolitan Area, Virginia

If the Navy awards a contract to a commercial shipyard facility in the Hampton Roads Metropolitan Area, Virginia, under Alternative 1, transport of ex-Enterprise would be limited to short-distance tows

within the area. Biological resources potentially impacted by initial transport of ex-Enterprise to a commercial port facility within the Port of Mobile are identified in Section 3.5.2.1 (Virginia).

Potential Impacts on ESA-Listed Species. Because of the potential presence of shortnose sturgeon, Atlantic sturgeon, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle in the lower portion of the James River, the Navy has determined that ship and tow line strike may affect these ESA-listed species. A summary of the Navy's analysis for potential impacts on these ESA-listed species is included below. The Navy has determined that ship noise would have no effect on Atlantic sturgeon critical habitat. Atlantic sturgeon critical habitat designations are based upon oceanographic conditions (e.g., water quality, sediment type), ship noise would not impact the ability of waters to function as habitat.

- **Shortnose sturgeon and Atlantic sturgeon**. The factors affecting the risk of strike to sturgeon are most likely size and speed of the ship, navigational clearance, and the behavior of sturgeon in the area (e.g., foraging, migrating). Shortnose sturgeon would be very rare within the James River and lower Chesapeake Bay, so they are not likely to be struck by the tow line or ex-Enterprise. The Atlantic Sturgeon Status Review Team determined Atlantic sturgeon in the James River are at a moderate risk from ship strikes (Atlantic Sturgeon Status Review Team, 2007). From 2007 to 2010, Balazik et al. (2012b) evaluated the cause of mortality to 31 carcasses of adult Atlantic sturgeon within the tidal freshwater portion of the James River in Virginia. Of those fish, all that were not too decomposed to properly examine exhibited gashes from ship propellers. Small, recreational boats would rarely encounter sturgeon, and it is most likely large, deep-draft ocean ships that contribute to strike and mortality of sturgeon in the James River (Balazik et al., 2012b). In summary, Atlantic sturgeon are more susceptible to ship or tow line strike compared to shortnose sturgeon because of the current ranges of these two species and their potential overlap with waters in the vicinity of the current mooring location and potential shipyard towing destinations within the Hampton Roads Metropolitan Area. Although ship and tow line strike of a shortnose sturgeon or Atlantic sturgeon would likely result in injury or death, the likelihood of a strike from a single tow event in the lower portion of the James River is discountable (unlikely to occur).
- **Sea turtles**. Sea turtles can detect approaching vessels, likely by sight (including lights from the vessel) rather than by sound (Bartol & Ketten, 2006; Hazel et al., 2007). Sea turtles seem to react more to slower moving vessels (2.2 knots) than to faster vessels (5.9 knots or greater). During an interaction between sea turtles and a 20 ft. (6 m) aluminum boat traveling at 10 knots, turtles were not able to dive to a depth sufficient to avoid collision (Hazel et al., 2007). Overall, the probability of the single ship tow encountering an ESA-listed sea turtle would be expected to be low, and the tow ship would have lookouts aboard monitoring for ship collision risks (see Section 3.5.1.3 [Best Management Practices]), which decreases the likelihood of ships or tow lines striking sea turtles. Additionally, the tow speed would be low, especially while moving through port areas, providing more opportunity for turtles to detect and avoid the ship. Any behavioral avoidance displayed, if an ESA-listed sea turtle were to encounter the tug and tow, would not result in significant disruption of breeding, feeding, or sheltering as the turtle would be expected to move away from the ship and quickly resume normal behavior. In summary, although ship and tow line strike may affect ESA-listed sea turtles, the likelihood of such an interaction is discountable (unlikely to occur).

Port of Mobile, Alabama

If the Navy awards a contract to a commercial shipyard location within the Port of Mobile, ex-Enterprise would be towed from its current mooring location approximately 1,830 nm (2,106 mi.) along the eastern

seaboard, around the southern tip of Florida, along the Florida and Alabama coastlines to Mobile, Alabama, for ship dismantling (see Figure 2-8). Biological resources potentially impacted by initial transport of ex-Enterprise to a commercial port facility within the Port of Mobile are identified in Section 3.5.2.2 (Alabama).

Ship and tow line strike could potentially impact offshore and pelagic marine organisms along the tow route from Newport News Shipbuilding to the Port of Mobile. As stated previously, ship strikes are an important cause of injury and mortality for marine mammals and sea turtles along the eastern seaboard and within the Gulf of Mexico and large fish species may also be susceptible to open-ocean ship strikes while on the surface; however, strike risk in the open ocean is relatively low for slow-moving ships under tow. Once inside of Mobile Bay, ex-Enterprise proceeds under tow along the Federal Mobile Harbor Navigation Channel to the Port of Mobile. The likelihood of a ship and tow line strike increases because of the higher density of marine animals inside of the bay. As with the open-ocean movement of the tow ship, the ship speed is expected to be sufficiently low to decrease the risk of strikes. Accordingly, strike risk within Mobile Bay and along the tow route is anticipated to be negligible.

Potential Impacts on ESA-Listed Species. Because of the potential presence of the Gulf sturgeon, green sea turtle, Kemp's ridley, hawksbill sea turtle, leatherback sea turtle, loggerhead sea turtle, and the West Indian manatee, the Navy has determined that that ship and tow line strike may affect these ESA-listed species as ex-Enterprise approaches the Port of Mobile through Mobile Bay.

- **Gulf sturgeon**. As discussed previously, sturgeon species are vulnerable to vessel strikes (NMFS, 2010). While vessel strike remains a general threat to sturgeon within Mobile Bay, the likelihood that the Proposed Action would result in a ship or tow line strike remains very low given the low tow speeds and the minimal time that ex-Enterprise under tow would be in areas where a strike may occur. Given the low speeds, infrequency of transit, and the expected low density of Gulf sturgeon along ex-Enterprise tow route through the Federal Mobile Harbor Navigation Channel to Port of Mobile commercial shipyard facility, the likelihood of a ship and tow line strike is extremely low, and therefore discountable (unlikely to occur).
- **Sea turtles**. Although sea turtles are not expected to occur within the lower reach of the Mobile River where shipyard facilities are located, sea turtles may occur along the tow route through Mobile Bay. Sea turtles spend most of their time submerged (Renaud & Carpenter, 1994; Sasso & Witzell, 2006), which reduces the risk of collision. Overall, the probability of the single ship tow encountering an ESA-listed sea turtle through Mobile Bay would be expected to be low and the tow would have lookouts aboard monitoring for ship collision risks (see Section 3.5.1.3 [Best Management Practices]), which decreases the likelihood of ships or tow lines striking sea turtles. Additionally, the tow speed would be low through Mobile Bay, providing more opportunity for turtles to detect and avoid the ship. Any behavioral avoidance displayed, if an ESA-listed sea turtle were to encounter the tug and tow through Mobile Bay, would not result in significant disruption of breeding, feeding, or sheltering as the turtle would be expected to move away from the ship and quickly resume normal behavior. In summary, although ship and tow line strike may affect ESA-listed sea turtles, the likelihood of such an interaction along the tow route to the Port of Mobile is discountable (unlikely to occur).
- **West Indian manatee**. Ship collisions are the primary anthropogenic cause of injury and mortality in the Florida subspecies (Runge et al., 2015; USFWS, 2014). Manatees are frequently exposed to potential ship collisions while foraging in shallow water, using thermal refuges, and moving among essential habitats (Buckingham et al., 1999; Gerstein, 2002). West Indian manatees respond to ship

movement via acoustic and possibly visual cues by moving away from the approaching ship, increasing their swimming speed, and moving toward deeper water (Miksis-Olds et al., 2007; Nowacek et al., 2004). The degree of the response varies with the individual manatee and may be more pronounced in deeper water, where they are more easily able to locate the direction of the approaching ship (Nowacek et al., 2004). This disturbance is a temporary response to the approaching ship. West Indian manatees have also been shown to seek out areas with a lower density of ships (Buckingham et al., 1999). West Indian manatees exhibit a clear behavioral response to ships within distances of 25–50 m (Nowacek et al., 2004). Martin et al. (2015) and Rycyk et al. (2018) found pronounced behavioral responses in tagged manatees when ships passed within 10 m of the animal. While ship speed did not have an impact on the occurrence, type, or number of behavioral changes observed in tagged manatees, results showed that manatees have more time to respond and changed their behavioral earlier when ships approached slowly compared to ships transiting on a plane at high speeds (approximately 17 knots [20 miles per hour] or greater) (Rycyk et al., 2018). Ex-Enterprise would enter Mobile Bay under tow at a speed estimated to be less than 10 knots (11.5 miles per hour) (NMFS, 2019) and transit through the Federal Mobile Harbor Navigation Channel to commercial shipyard facilities within the Port of Mobile along the Mobile River. At this speed, the risk of strike is greatly reduced because of the demonstrated ability of manatees to avoid slow moving ships. In addition, the Navy would require ex-Enterprise tow operator to maintain a lookout to minimize the risk of collision (this measure is a requirement of the 2019 NMFS Programmatic Biological Opinion for tow routes analyzed previously) (NMFS, 2019). Accordingly, the Navy has concluded that the risk for striking a West Indian manatee is discountable (unlikely to occur).

During the Navy's review of the current ranges for the Alabama sturgeon and Alabama red-bellied turtle, the Navy determined that the Proposed Action would have no effect on these two ESA-listed species. As discussed in Section 3.5.2.2 (Alabama), this riverine species is currently believed to be restricted to the lower portions of the Cahaba and Alabama rivers in south Alabama (Kuhajda & Rider, 2016) and does not occur within the lower reach of the Mobile River where shipyard facilities are located or along transportation routes through Mobile Bay. Accordingly, there would be no risk to the Alabama sturgeon from towing ex-Enterprise through Mobile Bay to shipyard facilities within the Port of Mobile. Alabama red-bellied turtles typically occur in vegetated expanses of shallow water (less than 2 m), in the backwater areas of bays, in and along river channels, and less frequently in oxbow lakes; and they require snags and dense beds of submersed and emergent aquatic vegetation for cover, predator avoidance, food, and structure for basking and thermoregulation. Because these habitat types do not occur along the tow route along the Federal Mobile Harbor Navigation Channel to Port of Mobile commercial shipyard facility, there would be no risk to this species from tow and tow line strike.

Port of Brownsville, Texas

If the Navy awards a contract to a commercial shipyard location within the Brownsville Ship Channel at the Port of Brownsville, ex-Enterprise would be towed from its current mooring location approximately 1,911 nm (2,200 mi.) along the eastern seaboard, around the southern tip of Florida, through the Gulf of Mexico, and enter the Brownsville ship channel to the Port of Brownsville for ship dismantling (see Figure 2-7).

Potential Impacts on ESA-Listed Species. Because of the reported presence of green sea turtles within the Brownville Ship Channel, the Navy has determined that towing ex-Enterprise through the Brownsville Ship Channel and to shipyard facilities at the Port of Brownsville may affect the green sea

turtle. In the 2019 NMFS Programmatic Biological Opinion (NMFS, 2019), NMFS assessed the potential for ship and tow line strike within the Port of Brownville for the ESA-listed green sea turtle. Green sea turtles may use auditory cues to react to approaching ships rather than visual cues, making them more susceptible to strike as ship speed increases (Hazel et al., 2007). Overall, the probability of the single ship tow encountering an ESA-listed sea turtle to a commercial dismantlement facility in the Port of Brownsville would be expected to be low, and the tow would have lookouts aboard monitoring for ship collision risks, which decreases the likelihood of ships or tow lines striking sea turtles. Additionally, the tow speed would be low through the Brownsville Ship Channel, providing more opportunity for turtles to detect and avoid the ship. Any behavioral avoidance displayed, if an ESA-listed sea turtle were to encounter the tug and tow through the Brownsville Ship Channel, would not result in significant disruption of breeding, feeding, or sheltering as the turtle would be expected to move away from the ship and quickly resume normal behavior. In summary, although ship and tow line strike may affect he green sea turtle, the likelihood of such an interaction along the tow route to the Port of Brownsville is discountable (unlikely to occur).

Ship Noise

Ship noise from contracted tug ships and towed Navy ships may be detectable to marine mammals, sea turtles, fish, and marine birds, although the density of species in the open ocean is so low that they are unlikely to be encountered. Nearshore species are more likely to be encountered in transit in the estuaries where origination and destination ports occur. However, these areas are already heavily trafficked by ships and the single towing event of ex-Enterprise is not expected to substantially increase noise levels above background or ambient conditions. Any response elicited from sensitive marine organisms due to ship noise is expected to be in the form of behavioral avoidance or interruption in behavior. Any behavioral response of a marine animal to ship noise would be of limited duration and magnitude. The temporary disturbance of marine mammals, sea turtles, fishes, marine birds associated with the anticipated interactions as part of the Proposed Action are not expected to result in injury or reduced fitness.

Hampton Roads Metropolitan Area, Virginia

If the Navy awards a contract to a commercial shipyard facility in the Hampton Roads Metropolitan Area, Virginia, under Alternative 1, transport of ex-Enterprise would be limited to short-distance tows within the area. Biological resources potentially impacted by initial transport of ex-Enterprise to a commercial port facility within the Port of Mobile are identified in Section 3.5.2.2 (Alabama). As discussed above, sound from contracted tug ships and towed Navy ships may be detectable to marine mammals, sea turtles, and fish, although the density of species in the open ocean is so low that they are unlikely to be encountered. Within the James River and lower Chesapeake Bay areas surrounding Hampton Roads Metropolitan Area, shipyard facilities are typically industrialized areas already exposed to high levels of anthropogenic noise (including vessel traffic) due to numerous waterfront users (e.g., industrial uses, marinas). The existing elevated anthropogenic noise in these industrialized ports would reduce the risk of behavioral responses (i.e., habituation of fish) and of masking (i.e., ship noise generated by the tug and tow would not likely exceed ambient noise levels except in very close proximity to the ship). The single movement of ex-Enterprise under tow would not significantly impact biological resources.

Potential Impacts on ESA-Listed Species. Because of the potential presence of shortnose sturgeon, Atlantic sturgeon, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea

turtle in the lower portion of the James River, the Navy has determined that ship noise may affect these ESA-listed species. A summary of the Navy's analysis for potential impacts on these ESA-listed species is included below. The Navy has determined that ship noise would have no effect on Atlantic sturgeon critical habitat. Atlantic sturgeon critical habitat designations are based upon oceanographic conditions (e.g., water quality, sediment type), ship noise would not impact the ability of waters to function as habitat.

- **Shortnose sturgeon and Atlantic sturgeon**. Because ship noise is low-frequency, it would be within the hearing range of sturgeon species (Popper, 2003, 2014). Shortnose sturgeon would be very rare within the James River and lower Chesapeake Bay, so they are not likely to be exposed to ship noise from the towing of ex-Enterprise. Shipyard facilities within the Hampton Roads Metropolitan Area are industrialized areas that are already exposed to high levels of anthropogenic noise (including vessel traffic) due to numerous waterfront users (e.g., industrial uses, marinas). The existing elevated anthropogenic noise in these industrialized ports would reduce the risk of behavioral responses (i.e., habituation of fish) and of masking (i.e., ship noise generated by the tug and tow would not likely exceed ambient noise levels except in very close proximity to the ship). Therefore, effects from ship noise associated with the Proposed Action in these areas would be temporary, localized, and consistent with existing port conditions. Long-term consequences to ESA-listed fish species are not expected as any behavioral effects would be short term as the towed ship passes through an area. In summary, Atlantic sturgeon are more likely exposed to ship noise compared to shortnose sturgeon because of the current ranges of these two species and their potential overlap with waters in the vicinity of the current mooring location and potential shipyard towing destinations within the Hampton Roads Metropolitan Area. Long-term consequences to ESA-listed fish species are not expected as any behavioral effects would be short term as the towed ship passes through an area. Due to the minimal and short term reactions anticipated, potential impacts from ship noise on ESA-listed sturgeon are expected to be insignificant (not measurable) and discountable (unlikely to occur).
- **Sea turtles**. Ship noise is low-frequency, and therefore, it would be within the hearing range of all sea turtle species (Popper, 2014). Little is known about how sea turtles use sound in their environment. Based on knowledge of their sensory biology (Bartol & Ketten, 2006; Levenson et al., 2004; Popper, 2014), sea turtles may be able to detect objects within the water column (e.g., vessels, prey, predators) via some combination of auditory and visual cues. However, research examining the ability of sea turtles to avoid collisions with vessels shows they may rely more on their vision than auditory cues (Hazel et al., 2007). Similarly, while sea turtles may rely on acoustic cues to identify nesting beaches, they appear to rely on other non-acoustic cues for navigation, such as magnetic fields (Hazel et al., 2007; Lohmann & Lohmann, 1996) and light (Avens & Lohmann, 2003; Levenson et al., 2004). Additionally, they are not known to produce sounds underwater for communication. Overall, sea turtles use of and reliance on hearing appears to be limited. Due to the low likelihood of occurrence of sea turtles within the James River and lower Chesapeake Bay and the industrialized nature of the ports, any reactions from sea turtles to noise from the single ship tow of ex-Enterprise from the current mooring location would be expected to be highly unlikely and too minor to be meaningfully evaluated. If an ESA-listed sea turtle were to encounter the tug and tow, ship noise would not result in significant disruption of breeding, feeding, or sheltering as the turtle would be expected to move away from the ship and quickly resume normal behavior. In summary, although ship noise may affect ESA-listed sea turtles, the likelihood of such an interaction is insignificant (not measurable) and discountable (unlikely to occur).

Port of Brownsville, Texas

As discussed above, sound from contracted tug ships and towed Navy ships may be detectable to marine mammals, sea turtles, and fish, although the density of species in the open ocean is so low that they are unlikely to be encountered. Once the towing ship passes between Brazos and Padre Islands (and entering the Brazos Ship Channel), ex-Enterprise would proceed under tow through the ship channel to the commercial dismantlement facility, and the likelihood of sound exposure increases because of the expected increase in density of marine animals within ship channel. However, these areas are already heavily trafficked by ships, and the single event of ex-Enterprise tow is not expected to substantially increase noise levels above background or ambient conditions. Any behavioral response of a marine animal to ship noise would be of limited duration and magnitude. Therefore, the Navy concludes that ship noise of ex-Enterprise under tow along the transit route from Newport News Shipbuilding to a commercial dismantlement facility in the Brownsville Ship Channel would have minimal impacts on biological resources.

Potential Impacts on ESA-Listed Species. Because of the reported presence of green sea turtles within the Brownville Ship Channel, the Navy has determined that ship noise generated by the single towing event of ex-Enterprise through the Brownsville Ship Channel may affect the green sea turtle. In the 2019 NMFS Programmatic Biological Opinion (NMFS, 2019), NMFS determined that ship-generated noise from towing inactive Navy ships is insignificant and discountable because of the heavily trafficked ship channel, the low numbers of green sea turtles anticipated to be in the ship channel, the slow movement of tug boat tow operations, and the likely avoidance of collision by sea turtles by detecting audible cues (Hazel et al., 2007). Therefore, NMFS determined that effects of ship noise generated by towing ex-Enterprise through the Brownsville Ship Channel would be insignificant (not measurable) and discountable (not likely to occur).

Port of Mobile, Alabama

As discussed above, sound from contracted tug ships and towed Navy ships may be detectable to marine mammals, sea turtles, and fish, although the density of species in the open ocean is so low that they are unlikely to be encountered. Once inside of Mobile Bay, ex-Enterprise proceeds under tow along the Federal Mobile Harbor Navigation Channel to the Port of Mobile, and the likelihood of sound exposure increases because of the expected increase in density of marine animals within the bay. However, these areas are already heavily trafficked by ships, and the single event of ex-Enterprise tow is not expected to substantially increase noise levels above background or ambient conditions. Any behavioral response of a marine animal to ship noise would be of limited duration and magnitude. Therefore, the Navy concludes that ship noise of ex-Enterprise under tow along the transit route from Newport News Shipbuilding to the Port of Mobile would have minimal impacts on biological resources.

Potential Impacts on ESA-Listed Species. Because of the potential presence of the Gulf sturgeon, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, and the West Indian manatee, the Navy has determined that ship noise may affect these ESA-listed species as ex-Enterprise approaches the Port of Mobile through Mobile Bay and along the tow route from Newport News Shipbuilding. Any response elicited from ESA-listed species due to ship noise is expected to be in the form of behavioral avoidance or interruption in behavior of limited duration and magnitude. Accordingly, the Navy has determined that potential effects resulting from ship noise to Gulf sturgeon, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, and the West Indian manatee would be insignificant (not measurable) and

discountable (unlikely to occur). As with the analysis for potential impacts from ship and tow line strike on the Alabama sturgeon and Alabama red-bellied turtle, the Navy has concluded that ship noise would have no effect on these two ESA-listed species because these species' ranges are not within any areas where ship movements would occur.

3.5.3.2.2 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

As described in Section 2.3.2.4 (Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility [Following Route Around South America]), the propulsion space section, which contains eight reactor plants, would be separated from the rest of ex-Enterprise and would then be transported to PSNS & IMF by heavy-lift ship (instead of in-water tow). The heavy-lift ship would leave the commercial dismantlement facility, navigate around the southern tip of South America, and then transit north to the U.S. West Coast, continuing up the coast to northwestern Washington and into the Strait of Juan de Fuca, then south through Puget Sound, ultimately arriving at PSNS & IMF. Figure 2-5 shows the potential routes of the heavy-lift ship, depending on which commercial dismantlement location would be utilized.

The various transit routes under Alternative 1 would traverse numerous open-ocean and nearshore biomes, which may present a vessel and tow line strike risk to marine animals (particularly marine mammals and sea turtles) (NMFS, 2019). For whales, studies show that the probability of fatal injuries from vessel strikes increases as ships operate at speeds above 14 knots (16 miles per hour) (Laist et al., 2001). Hazel et al. (2007) suggests that sea turtles may use auditory cues to react to approaching ships rather than visual cues, making them more susceptible to strike as ship speed increases.

Ship speeds ranging from 14 to 24 knots (16 to 28 miles per hour) is the general optimal cruising speed of container ships and represents the hydrodynamic limits of the hull to perform within acceptable fuel consumption levels. Most container ships are designed to travel at speeds around 24 knots. In recognition of the significant hazard ship strikes have on marine mammals along the U.S. East Coast, the National Oceanic and Atmospheric Administration established in 2008 mandatory right whale ship strike reduction rule, establishing ship speed restrictions of 10 knots or less for ships 65 ft. in length or greater for several areas along the western Atlantic during specified times of the year (50 Code of Federal Regulations Part 224.105). Any heavy-lift ship transporting the propulsion space section, because of the ship size over 65 ft., would be subject to this rule.

The Navy has concluded that heavy-lift ship transport of the propulsion space section to PSNS & IMF would have negligible impacts on biological resources. This conclusion is based on the following:

- Heavy-lift ship speeds would generally be slower than other ships that travel at speeds known to present significant strike risks to marine mammals and sea turtles. In contrast to regular container ship traffic, heavy-lift ship speed is expected to average approximately 10 knots (11.5 miles per hour) and not exceed 14 knots (16 miles per hour).
- The heavy-lift ship transit is considered a normal maritime activity, and with only one heavy-lift ship transport trip proposed under Alternative 1, the increase in maritime traffic would be negligible.

On approach to PSNS & IMF, the propulsion space section would be brought into port under tug. Bringing in the propulsion space section of ex-Enterprise via heavy-lift ship may affect ESA-listed species along the heavy-lift routes from commercial dismantlement facilities around the southern tip of South

America, up the South and North American coasts, to PSNS & IMF. Because of the low ship speed (reduced strike risk), the Navy has determined that the heavy-lift ship movement would not likely adversely affect ESA-listed species and there would be no reasonably foreseeable takes of MMPA-protected species along the heavy-lift ship route (listed in Appendix H [ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes]) or within Puget Sound (see Section 3.5.2.4.1 [Puget Sound Naval Shipyard & Intermediate Maintenance Facility and Sinclair Inlet]).

3.5.3.2.3 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages (No In-Water Work)

Work at PSNS & IMF is discussed in Section 2.3.2.5 (Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages [No In-Water Work]). This work involves liquid removal (draining of the piping, tubing, and fluid systems remaining in the reactor compartments), equipment removal, reactor compartment packaging, and efforts to reduce radiation exposure to workers and the environment. These activities are considered normal pier-side and dry dock actions, with similar activities analyzed previously (Navy & DOE, 1996). Section 3.1 (Public and Occupational Health and Safety) includes detailed descriptions of policies and procedures to ensure safe removal of liquids and equipment.

Risk to biological resources from pier-side and dry dock work is minimized because none of the work would occur in the water and because of the standard operating procedures summarized in Section 3.1 (Public and Occupational Health and Safety). Similar work for ex-Enterprise reactor compartment removal and pier-side work was analyzed for inactive Navy cruisers in the 1996 Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants, hereinafter referred to as the 1996 EIS (Navy & DOE, 1996) and determined that pier-side and dry dock work would have no significant impacts on biological resources and no effect on ESA-listed species that may occur within the general vicinity of PSNS & IMF.

3.5.3.2.4 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

Installation of additional rail structures within Trench 94 at the DOE Hanford Site is discussed in Section 2.3.2.6 (Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site). In 1996, DOE and Navy analyzed the placement of 220 reactor compartment packages in Trench 94; since that analysis, PSNS & IMF has used the concrete rail support system to place the reactor compartment packages within the trench (Navy & DOE, 1996). Ex-Enterprise reactor compartment packages would fit within the trench floor footprint and are well within the 220 total packages analyzed in 1996. Additional rail structures, however, would be added within Trench 94 at the DOE Hanford Site to support the single reactor compartment packages from ex-Enterprise, requiring limited excavation of the trench floor.

The 1996 EIS analysis determined that the placement of 220 reactor compartment packages (including the eight reactor compartment packages from ex-Enterprise under Alternative 1) would have no significant impacts on biological resources. Because limited excavation activities would be required to install additional rail components within Trench 94 at the DOE Hanford Site (previously disturbed areas), the Navy concludes that this project component would have no significant impacts on biological resources and no effect on ESA-listed species.

3.5.3.2.5 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

Reactor compartment packages would be transported by barge from PSNS & IMF to the Port of Benton barge slip. See Section 2.3.2.7 (Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip) for complete description of barge transport of the reactor compartment packages. The barge route would follow the normal deep-water shipping lanes from PSNS & IMF, through Rich Passage, past Restoration Point, and northerly through Puget Sound. Proceeding through the Strait of Juan de Fuca (in U.S. territorial waters), and southerly down the Washington coast, the barge would turn east into the mouth of the Columbia River. Following the shipping channel used for the regular transport of commercial cargo, the river route would pass through the navigation locks at Bonneville, the Dalles, John Day, and McNary Dams before reaching the barge slip in the upper portion of Lake Wallula.

Although the barge route traverses through numerous habitat types and biomes, the Navy has assessed the stressors generated by a single barge transport of the reactor compartment packages to be discountable, as barge transport is a normal maritime activity. The eight reactor compartment packages would be shipped periodically as they are completed, allowing one shipment at a time. The Navy has based this determination on a history of transporting reactor compartment packages to the Port of Benton barge slip for final disposal at the DOE Hanford Site and compliance with environmental regulations that ensure safe transport. For example, the transport route for ex-Enterprise reactor compartment packages would be the same as the route used for the various cruiser and submarine packages previously shipped with no impacts on biological resources (Navy & DOE, 1996, 2012). Further, maintenance of the barge slip bottom to support offload of reactor compartment packages would comply with requirements of permits issued by USACE and WDFW. Accordingly, barge transport would have no significant impacts on biological resources, and would have no effect on ESA-listed species that may occur along the barge transport route.

3.5.3.2.6 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

Once a reactor compartment package is unloaded at the Port of Benton barge slip, it is transported over land to the DOE Hanford Site. See Section 2.3.2.8 (Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site) for complete description of over land transport for the reactor compartment packages (see Figure 2-12).

Under Alternative 1, no modifications to road infrastructure are required. Accordingly, the Navy has determined that potential impacts on biological resources are negligible. There are no ESA-listed species that would be affected by the land transport phase.

3.5.3.3 Alternative 2: Dual Reactor Compartment Packages

Alternative 2 is the same as Alternative 1, except the Navy would dispose of four dual reactor compartment packages (instead of eight single reactor compartment packages) at Trench 94 at the DOE Hanford Site near Richland, Washington. Impact analysis associated with towing, partial dismantlement, propulsion space section shipment, and reactor compartment package construction efforts would be the same as for Alternative 1.

Section 2.3.3.6 (Port of Benton Barge Slip Modifications) and Section 2.3.3.7 (Road Improvements Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site) provide details of the different construction activities necessary to implement Alternative 2. These infrastructure

improvements are needed to facilitate passage of the dual reactor compartment packages and include modification to the Port of Benton barge slip and road improvements from the barge slip to Trench 94 at the DOE Hanford Site. This section analyzes the potential impacts on biological resources that may result from these infrastructure improvements, in particular, in-water work within and adjacent to the Columbia River channel and ground disturbance along the land route. Figure 3.5-3 shows the conceptual framework for analyzing potential impacts resulting from Alternative 2.

3.5.3.3.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

Initial transport of ex-Enterprise under Alternative 2 would be the same as described under Alternative 1, where ex-Enterprise would be towed from its current location at Newport News Shipbuilding in Newport News, Virginia, to one of three commercial locations analyzed for partial dismantlement (commercial dismantlement facilities at the Hampton Roads Metropolitan Area, Virginia; the Port of Brownsville, Texas; or the Port of Mobile, Alabama). The analysis and conclusions for initial transport under Alternative 2 for biological resources are the same as for Alternative 1 (see Section 3.5.3.2.1 [Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility]). As discussed in Section 3.5.3.2.1, the Navy has determined that initial transport of ex-Enterprise would have minimal impacts on biological resources.

Potential Impacts on ESA-Listed Species. Based on the analysis under Alternative 1, the action under Alternative 2 to tow ex-Enterprise to commercial shipyard facilities at the Hampton Roads Metropolitan Area may affect the shortnose sturgeon, Atlantic sturgeon, Atlantic sturgeon critical habitat, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle. Stressors associated with towing of ex-Enterprise from its current mooring location to the Port of Mobile through Mobile Bay may affect Gulf sturgeon, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, and the West Indian manatee. Towing along this route through Mobile Bay to the Port of Mobile would have no effect on the Alabama sturgeon or the Alabama red-bellied turtle. Towing of ex-Enterprise from the current mooring location to the Port of Brownsville may affect green sea turtles potentially occurring within the Brownsville Ship Channel. These determinations are included in the 2019 NMFS Programmatic Biological Opinion (NMFS, 2019).

In addition, the 2019 NMFS Programmatic Biological Opinion determined that the towing of inactive ships may affect, but would not likely adversely affect, numerous ESA-listed marine mammals, fishes, and sea turtles along the tow routes to the Port of Brownsville and shipyard facilities at the Hampton Roads Metropolitan Area, Virginia (see Appendix H [ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes]). As noted previously, the Port of Mobile was not included in the 2019 NMFS Programmatic Biological Opinion.

Potential Impacts on EFH. As described above under Alternative 1, in-water hull cleaning typically occurs over a long period of time (i.e., weeks to months), and biofouling material would be released slowly over time, allowing it to disperse within the environment. Under Alternative 2, in-water cleaning would only occur at Newport News Shipbuilding if ex-Enterprise was towed to the Port of Mobile or Port of Brownsville. Although in-water hull cleaning can impact levels of DO, turbidity, nitrate, organic debris and dissolved metals in the water column, monitoring studies have shown these conditions to be very temporary, decreasing rapidly to ambient concentrations after cessation of the cleaning activity (NMFS, 2019). Therefore, the Navy has determined that hull cleaning activities may adversely affect water and substrate quality and biogenic habitats that serve as EFH and HAPC. However, these impacts are expected to be very minor in severity, short term in duration, and limited in spatial extent to the area immediately under and adjacent to the footprint of the vessel.

3.5.3.3.2 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (Following Route Around South America)

Under Alternative 2, the relocation of the propulsion space section would use the same heavy-lift ship routes analyzed under Alternative 1. For reasons stated under Alternative 1 (see Section 3.5.3.2.2 [Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility {Following Route around South America}]), potential impacts on biological resources during the relocation of the propulsion space section from the commercial dismantlement port to PSNS & IMF would be negligible. This conclusion is based on the low ship speed of the heavy-lift ship in transit to PSNS & IMF, and that heavy-lift ship transport is a normal maritime activity.

As with Alternative 1, the propulsion space section would be brought into PSNS & IMF under tug. Bringing in ex-Enterprise's propulsion space section via heavy-lift ship would not adversely affect ESA-listed species described in Section 3.5.2.4.1 (Puget Sound Naval Shipyard & Intermediate Maintenance Facility and Sinclair Inlet).

3.5.3.3.3 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Four Dual Reactor Compartment Packages (No In-Water Work)

The analysis for biological resources under Alternative 2 is the same as for Alternative 1, as discussed in Section 3.5.3.2.3 (Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages [No In-Water Work]). Accordingly, the Navy has determined that there would not be significant impacts on biological resources and no effect on ESA-listed species.

3.5.3.3.4 Port of Benton Barge Slip Modifications

Port of Benton barge slip modifications are described in Section 2.3.3.6 (Port of Benton Barge Slip Modifications). In-water work is required for excavation to allow for widening of the current barge slip, while pile driving and concrete work would occur on land. Based on this description, the type of construction methods, and dredging and filling requirements for the project, the Navy has identified two stressors for analysis—water and sediment quality degradation and construction-generated sound. Biological resources are described for the barge slip modification area in Section 3.5.2.4.2 (Port of Benton Barge Slip). In addition to an assessment of potential impacts on general biological resources, the three ESA-listed fish species known to occur in this area are evaluated under each stressor category below.

Water and Sediment Quality Degradation

As stated in Section 2.3.3.6 (Port of Benton Barge Slip Modifications), infrastructure improvements are expected to remove approximately 2,625 cubic yards of material from the south jetty and from areas within the channel to reshape the substrate for expanding the Port of Benton barge slip. Approximately 71 cubic yards of material would be placed within the footprint of the expanded barge slip and along the sheet pile wall to provide erosion protection. Slip widening is necessary to accommodate the barge size to carry the larger dual reactor compartment packages and would increase the slip width by 18 ft. and extend the length by 15 ft. The new slip would be 80 ft. wide and 165 ft. long.

In-water work would require some equipment stationed in the water adjacent to the Port of Benton barge slip; therefore, direct disturbance to the riverbed and water quality is certain to occur during construction activities. Operation of equipment during barge slip modification would require the use of fuel and lubricants, which, if spilled into the Columbia River or into the adjacent riparian zone, can injure

or kill aquatic organisms. Petroleum-based contaminants contain poly-cyclic aromatic hydrocarbons which can be acutely toxic to salmonids and other aquatic organisms at high levels of exposure and cause lethal and sublethal effects (Culbertson et al., 2008).

Several measures would minimize or avoid potential impacts on water and sediment quality at the Port of Benton barge slip modification area. These measures are listed in Section 3.5.1.3 (Best Management Practices) and include adherence to regulatory in-water work windows, inspection of equipment prior to in-water work, provisions for offsite fueling and lubrication of equipment, spill prevention plans to prevent chemicals from entering the Columbia River (e.g., fuels, oils, grease, bitumin, paint, and waste washings), and use of turbidity fencing for in-water work. As a habitat enhancement measure for juvenile salmonids, gravel of a specific composition and size specific for juvenile habitat would be placed under the footprint currently occupied by the south jetty after the south jetty is removed. Gravel would be placed on the river bottom over the footprint of the expanded barge slip, including that of the current footprint.

In addition, the removal (dredging) of 2,625 cubic yards and the placement of 71 cubic yards of fill material within a Navigable Water would be subject to regulation under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, and would require a Department of the Army permit from the USACE and the appropriate state permit issued by the Washington State Department of Ecology. Any sediment removed from the Port of Benton would be disposed of at an upland location. The permit may include conditions that would be expected to be leveed to further reduce potential impacts on biological resources.

Based on the protective measures to contain turbidity and to reduce the likelihood of chemical contamination into the Columbia River and the addition of favorable salmonid river bottom habitat following removal of the south jetty, the Navy has determined that in-water construction activities and associated water and sediment quality stressors would have minimal impacts on biological resources.

Potential Impacts on ESA-listed Species. Under Alternative 2, construction activities would disturb sediments and temporarily suspend solids in the river channel used by ESA-listed salmonid species; therefore, the Navy has determined that the Proposed Action may affect the Chinook salmon (Upper Columbia River Spring-Run ESU), steelhead (Upper Columbia River DPS and Middle Columbia River DPS), and bull trout (Columbia River DPS). For Alternative 2, consultation would be required with NMFS and USFWS pursuant to section 7 of the ESA for infrastructure improvements at the Port of Benton barge slip. As part of the Proposed Action under Alternative 2, there are a number of measures that would minimize or avoid potential impacts on ESA-listed salmonids. These measures include the following:

- The scheduling of in-water work within the in-water work window of December 15–February 28, as identified in the 2020 NMFS Biological Opinion (USACE, 2020). This is the time frame where fish are least expected to be migrating through the area. Additionally, given the low presence of fish in the area during late fall, moving the time frame toward November 1 to accommodate construction schedule needs should have minimal biological impact (USACE, 2012). Work during these time frames would still require consultation with NMFS and USFWS.
- The use of turbidity fences during in-water construction activities, as required by Department of the Army permitting pursuant to the Clean Water Act, would further reduce any additional residual impacts on salmonids and salmonid habitat.

Therefore, the Navy concludes that any effects on ESA-listed species resulting from Alternative 2 would likely be discountable (unlikely to occur) and insignificant (not measurable). Further, construction

activities under Alternative 2 would also include the placement of gravel on the south jetty footprint. This measure is intended to provide substrate habitat preferred by juvenile salmonids. A study conducted by Trumbo (2017) for the USACE determined that the existing substrate surrounding the south jetty is of poor quality; therefore, Navy construction activities would likely enhance and improve available salmonid habitat within the general vicinity of the Port of Benton barge slip.

In-water construction activities would occur in designated critical habitat for Chinook salmon (Upper Columbia River Spring-Run ESU), steelhead (Upper Columbia River DPS and Middle Columbia River DPS), and bull trout (Columbia River DPS) (see Figure 3.5-8). As part of the Proposed Action, as stated above, the channel substrate to the south side of the Port of Benton barge slip would be altered through dredging and filling. As a result, the project would include habitat impacts within this designated critical habitat area. Therefore, the Navy has determined that the Proposed Action may affect these critical habitat designations. The project would not affect critical habitat outside the immediate area. The Navy anticipates that effects to ESA-listed salmonid habitat resulting from the Proposed Action would be discountable (unlikely to occur) and insignificant (not measurable). This preliminary conclusion is based on an analysis of potential impacts on the nine salmonid PCEs defined in Section 3.5.2.4.2 (Port of Benton Barge Slip). This analysis is summarized below by each PCE:

- **Water quality**. Construction activities associated with the Port of Benton barge slip modifications would temporarily degrade water quality in the immediate area; however, turbidity would be contained within turbidity curtains and would not continue after the project is complete. Therefore, the Navy anticipates that this principal biological feature would not be adversely affected by in-water construction because of the containment and the temporary duration of construction within the in-water work window discussed above and in Section 3.5.1.3 (Best Management Practices).
- **Migration habitat**. As part of the Proposed Action, the Navy would replace the south jetty of the existing barge slip with gravel substrate known to benefit juvenile salmonids. Therefore, the Navy anticipates that the Proposed Action would improve habitat for juvenile Chinook salmon migrating down the Columbia River along the shoreline.
- **Food availability**. The replacement of the south jetty with gravel substrate would also add a benthic food production area along the channel bottom. Therefore, the Navy anticipates that the Proposed Action would beneficially affect food availability for all salmonid species.
- **Instream habitat**. The increase in the area available for benthic food production would also enhance the instream habitat availability. The placement of gravels preferred by juvenile salmonids to the south side of the slip would further improve this area as habitat for salmonids. Therefore, the Navy anticipates that the Proposed Action would beneficially affect instream habitat for all salmonid species.
- **Water temperature**. Construction activities would not alter the water temperature of the Columbia River. Therefore, the Navy has determined that in-water construction activities at the Port of Benton barge slip would have no effect on the water temperature principal biological feature.
- **Substrate characteristics**. Substrate in the area would be altered by excavation, placement of fill and removal of the south jetty. While the area has been historically scoured by tug use, the Port of Benton barge slip could accommodate larger and wider barges than under the current design. Larger barges would necessitate an adjustment in the placement of the tugs that push the

barges into place. This adjustment would cause scour further out into the river. The resulting scour would be less likely to create potential ambush sites of juvenile salmonids by predatory fish, because of the deeper water and further distance from new gravel substrates and benthic food production areas. Additionally, after completion of the four reactor compartment shipments under Alternative 2, tug boats would no longer be situated at this location in the river to cause scour. Therefore, the Navy anticipates that effects of scour on instream habitat for salmonid species from the Proposed Action would be minimal and temporary.

- **Stream flow**. Stream flow would be altered directly at the project site. Water flow would change when the existing south jetty, which currently impedes water movement, is removed and water can move directly through the area. Therefore, the Navy anticipates that the Proposed Action would beneficially affect stream flow for all salmonid species.
- **Water quantity**. Construction activities would not alter the quantity of water within the Columbia River. Therefore, the Navy has determined that in-water construction activities at the Port of Benton barge slip would have no effect on the water quantity principal biological feature.
- **Nonindigenous species**. Construction activities would not introduce potentially invasive species into the Columbia River. Therefore, the Navy has determined that in-water construction activities at the Port of Benton barge slip would have no effect on the nonindigenous species principal biological feature.
- **Potential Impacts on EFH.** As described above, water quality and sediment degradation would occur within the Port of Benton barge slip project area during the in-water construction period. Construction activities associated with the Port of Benton barge slip modifications would temporarily degrade water quality in the immediate area; however, turbidity would be contained within turbidity curtains and would not continue after the project is complete. Substrate in the area would be altered by excavation during the construction period, which includes the addition of gravel substrates favorable for juvenile salmon foraging. Therefore, the Navy has determined that in-water construction activities may adversely affect water and substrate quality and biogenic habitats that serve as EFH for Chinook and coho salmon. However, these impacts are expected to be very minor in severity, short term in duration, and limited in spatial extent.

Construction Noise

As described in Section 2.3.3.6 (Port of Benton Barge Slip Modifications), multiple types of heavy equipment, such as hydraulic excavators, pile drivers, cranes, and dump trucks are expected to be used. No pile driving would occur in water.

Potential impacts on birds and other terrestrial species would likely be limited to behavioral reactions, where individual animals in close proximity would likely respond by increasing distance away from construction activities. No long-term consequences to individual animals are expected. Accordingly, there would be no consequences to any bird populations, and pile driving would not have a major adverse effect on populations of migratory bird species. Further, scheduling of construction activities (winter months) would reduce potential exposures to wildlife species. Bald eagles may be present within the project area as they are known to overwinter at the confluence of the Snake and Columbia Rivers, and there is evidence of foraging (salmon carcasses) along the shoreline of the Columbia River near the Port of Benton barge slip. Although bald eagles may perch and feed within the project area, it is not

likely that temporary displacement from the project area during construction would measurably impact bald eagles. The nearest known nest is 7 mi. away, well outside the recommended standoff distance of 660 ft. With no nest disturbance or destruction, construction activities would have no effect or take (to include disturbance) of either bald or golden eagles that would require consultation with the USFWS pursuant to the BGEPA.

Other aquatic wildlife, such as amphibians, turtles, and aquatic mammals would only be exposed to noise generated under Alternative 2 construction activities if they were in the close vicinity to impact or vibratory pile driving activities. Disturbance associated with normal construction activities would result in animals distancing themselves from the construction site before on-land pile driving begins. These animals are expected to most likely respond by increasing distance from construction noise sources, or not respond at all. As discussed above, impacts on individual animals, if any, are expected to be minor and limited. No long-term consequences to individuals are expected. If animals are present, they may be exposed to in-air noise from pile driving, but they would be expected to avoid the area around active impact and vibratory pile driving construction activities.

The Navy has determined that noise generated by construction activities at the Port of Benton barge slip modification area would have no significant impacts on biological resources. This conclusion is based on the following:

- The Navy anticipates that the majority of the sound would attenuate through the ground before reaching the water, and that impacts on aquatic species would be minor in terms of impact and of temporary duration.
- The planned equipment use would produce noise levels greater than those typically occurring during recreation boating nearby and offloading operations at the Port of Benton barge slip modification area. However, none are expected to reach levels injurious to aquatic and terrestrial species.
- The scheduling of in-water construction activities would avoid seasonal migrations of fish and other wildlife (with the exception of wintering bull trout, steelhead, and stream-type Chinook).

Potential Impacts on ESA-Listed Species. The Navy has determined that the construction activities under Alternative 2 may affect the Chinook salmon (Upper Columbia River Spring-Run ESU), steelhead (Upper Columbia River DPS and Middle Columbia River DPS), and bull trout (Columbia River DPS). Sound produced under Alternative 2, however, would not likely disturb ESA-listed fish species because the highest noise-generating construction activities (sheet pile installation using a vibratory hammer, pipe pile installation using an impact hammer) would all occur on land. Most sound from pile driving activities would attenuate through the ground prior to reaching the water. To further avoid impacts to peak migrations of ESA-listed fish, in-water construction activities are scheduled to occur in winter months when salmonids are not migrating through the portion of the Columbia River of upper Lake Wallula. The Navy anticipates that in-water construction activities would occur between December 15 and February 28. The final in-water work window for any modifications of the Port of Benton barge slip would be determined during consultation with NMFS and USFWS, and in conformance with applicable WAC provisions for minimizing impacts on salmonid migrations. Salmonids, if any, would be expected to occur in only very low numbers. Further, most sound from pile driving activities would attenuate through the ground prior to reaching the water. Therefore, the Navy anticipates that potential adverse effects resulting from construction activities would be discountable (unlikely to occur) and insignificant (not measurable). Construction activities may affect Steelhead Snake River Basin DPS and Chinook salmon

Snake River Spring/Fall Run ESU if these salmon do not enter the Snake River and continue up the Columbia River. To date, there are no indications that these salmon would reach the Port of Benton barge slip project area; therefore, the Navy has determined that construction activities at the barge slip would have no effect on Steelhead Snake River Basin DPS and Chinook salmon Snake River Spring/Fall Run ESU.

Potential Impacts on EFH. The Navy has determined that the noise generated during construction activities under Alternative 2 may affect Chinook and coho salmon water column EFH. As described above, construction noise would not likely disturb these species or prey items because the highest noise-generating construction activities (sheet pile installation using a vibratory hammer, pipe pile installation using an impact hammer) would all occur on land and most sound from pile driving activities would attenuate through the ground prior to reaching the water. To further avoid impacts on EFH, in-water construction activities are scheduled to occur in winter months when salmonids are not migrating through the portion of the Columbia River of upper Lake Wallula. Therefore, the Navy anticipates that potential adverse effects to water column EFH within the Columbia River resulting from construction activities are expected to be very minor in severity, short term in duration, and limited in spatial extent.

3.5.3.3.5 Road Modifications Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site

The route between the Port of Benton barge slip and Trench 94 at the DOE Hanford Site would require improvements such as cutting or filling to reduce the vertical curve, filling dips in the road, paving medians, filling low sides or cutting high sides to reduce side slope, and filling road shoulders to improve intersections (see Section 2.3.3.7 [Road Improvements Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site]), for a description of the affected environment for biological resources).

Ground Disturbance

Based on the literature review for potential biological resources within the area subject to impacts, the Navy determined that the majority of these ground disturbing activities would take place on the existing roads, road margins, and the non-vegetated road-side berms. These processes could result in damage to areas adjacent to the project area from heavy machinery use. Heavy equipment can crush vegetation and compact soils, potentially damaging plant roots. Bare, disturbed, and compacted soils are vulnerable to weed invasion through natural dispersal (e.g., wind-blown seeds) or man-made dispersal (e.g., vehicles and machinery moving from site to site). However, if the activities are to remain within the existing road prism, no adverse impacts are anticipated. Road improvements would include best management practices pursuant to the DOE Hanford Site Biological Resources Management Plan and construction policies in DOE (2017b). At a minimum, proposed road improvement actions would avoid the undisturbed habitats adjacent to the project area, while keeping vehicles and heavy machinery within the non-vegetated road prism at all times, including the staging of materials, equipment, and machinery. To reduce the potential of invasive species introduction and establishment at the DOE Hanford Site, all vehicles and equipment used for construction would use cleaning stations prior to and after daily work activities.

After review of the *Bald Eagle Management Plan for the Hanford Site* (DOE, 2017a), the Navy has determined that land transport improvements would not impact bald eagles because the distance to known and historic nest sites is beyond the effects of the project. As discussed in Section 3.5.2.4.3 (Land

Transport Route from the Port of Benton Barge Slip to Final Disposal Location at the Department of Energy Hanford Site), bald eagles are known to winter along the Columbia River on the DOE Hanford Site, but no eagle nest has been reported near the barge slip. In summary, potential impacts on biological resources associated with road improvement actions under Alternative 2 would have minimal impacts on biological resources.

3.5.3.3.6 Installation of a Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

As stated in Section 2.3.3.8 (Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site), the rail system installation in Trench 94 at the DOE Hanford Site would be the same as described for Alternative 1. The DOE and Navy 1996 EIS determined that the placement of 220 reactor compartment packages (including the four reactor compartment packages from ex-Enterprise under Alternative 2) would have no significant impacts on biological resources (Navy & DOE, 1996). Because limited excavation activities would be required to install additional rail components within Trench 94 at the DOE Hanford Site (previously disturbed areas), the Navy concludes that this project component would have no significant impacts on biological resources and no effect on ESA-listed species.

3.5.3.3.7 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip

The four reactor compartment packages of Alternative 2 would be transported by a barge capable of handling the larger dual reactor compartment packages via the transport route from PSNS & IMF to the Port of Benton barge slip at Richland, Washington, similar to Alternative 1. As with Alternative 1, the Navy has concluded that barge transport, a normal maritime transport activity, from PSNS & IMF would have minimal impacts on biological resources.

Appendix H (ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes) includes a list of ESA-listed species that may potentially occur along the barge transport route. Because the routine nature of this activity would not significantly contribute to baseline maritime or river transportation, the Navy has determined that barge transport under Alternative 2 would have no effect on these species.

3.5.3.3.8 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

From the Port of Benton barge slip at Richland, Washington, the dual reactor compartment packages would be loaded onto a multiple-wheel, high-capacity transporter capable of handling the larger dual reactor compartment packages for transfer to Trench 94 on the DOE Hanford Site. As with Alternative 1, the Navy has concluded that the potential for impacts on biological resources are minimal. There are no ESA-listed species within the vicinity of the land transport route.

3.5.3.4 Alternative 3 (Preferred Alternative): Commercial Dismantlement

As described in Section 2.3.4 (Alternative 3 [Preferred Alternative] – Commercial Dismantlement), implementation of Alternative 3 (Preferred Alternative) would consider commercial contractors and port facilities for ship dismantlement and recycling activities. Dismantlement of ex-Enterprise at an authorized commercial (non-Navy) ship dismantlement facility includes cutting apart the eight reactor plants into segments for packaging into several hundred small containers that meet Department of Transportation requirements for subsequent disposal at either a DOE and/or authorized commercial low

level radioactive waste. Figure 3.5-4 shows the conceptual framework for analyzing potential impacts resulting from Alternative 3 (Preferred Alternative).

3.5.3.4.1 Tow ex-Enterprise from Newport News, Virginia to Commercial Dismantlement Facility

Initial transport of ex-Enterprise under Alternative 3 (Preferred Alternative) would be as described under Alternative 1, where ex-Enterprise would be towed from its current location at Newport News Shipbuilding in Newport News, Virginia, to one of three commercial locations for partial dismantlement: commercial dismantlement facilities in the Hampton Roads Metropolitan Area, Virginia; the Port of Brownsville, Texas; or the Port of Mobile, Alabama. The analysis and conclusions for initial transport under Alternative 3 (Preferred Alternative) are the same as for Alternative 1 (see Section 3.5.3.2.1 [Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility]). In summary, the Navy has determined that initial transport of ex-Enterprise would have minimal impacts on biological resources.

Potential Impacts on ESA-Listed Species. The potential effects of initial transport to ESA-listed species were analyzed for each destination port, as well as for the implementation of in-water hull cleaning mitigation measures at the current mooring location at Newport News Shipbuilding. Paralleling the analysis under Alternative 1, in-water hull cleaning may affect Atlantic sturgeon, green sea turtle, Kemp's ridley sea turtle, and leatherback sea turtle. In-water hull cleaning may affect Atlantic sturgeon critical habitat where that cleaning would occur in the waters of Hampton Roads Metropolitan Area, Virginia. Ship and tow line strike and ship noise may affect the shortnose sturgeon, Atlantic sturgeon, Gulf sturgeon, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, hawksbill sea turtle, loggerhead sea turtle, and West Indian manatee. The Navy has determined that Alternative 3 (Preferred Alternative) would have no impact on the Alabama sturgeon or the Alabama red-bellied turtle. The Navy has determined that stressors on ESA-listed species associated with towing ex-Enterprise to a commercial dismantlement facility are discountable (unlikely to occur). The Navy would, to the maximum extent practicable, conduct in-water hull cleaning from November 1 through February 28 in order to reduce potential effects to adult Atlantic sturgeon and sea turtles. If this schedule is achieved, hull cleaning would not affect any sea turtle species, and the potential effects to Atlantic sturgeon and their critical habitat would be discountable.

The Navy has consulted with both NMFS and USFWS pursuant to section 7(a)(2) of the ESA for Alternative 3 (Preferred Alternative). Agency documentation is provided in Appendix D (Consultation Correspondence). The 2019 NMFS Programmatic Biological Opinion determined that the towing of inactive ships may affect, but would not likely adversely affect, numerous ESA-listed marine mammals, fishes, and sea turtles along the tow routes to the Port of Brownsville and shipyard facilities at the Hampton Roads Metropolitan Area, Virginia (see Appendix H [ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes]).

Potential Impacts on EFH. As described above under Alternatives 1 and 2, in-water hull cleaning typically occurs over a long period of time (i.e., weeks to months), and biofouling material would be released slowly over time, allowing it to disperse within the environment. Under Alternative 3 (Preferred Alternative), in-water hull cleaning would only occur at Hampton Roads Metropolitan Area if ex-Enterprise was towed to the Port of Mobile or Port of Brownsville. Although in-water hull cleaning can impact levels of DO, turbidity, nitrate, organic debris and dissolved metals in the water column, monitoring studies have shown these conditions to be temporary, decreasing rapidly to ambient concentrations after cessation of the cleaning activity (NMFS, 2019). Therefore, the Navy has determined that hull cleaning activities may adversely affect water and substrate quality and biogenic

habitats that serve as EFH and HAPC. However, these impacts are expected to be very minor in severity, short term in duration, and limited in spatial extent. The Navy has consulted with NMFS pursuant to the Magnuson-Stevens Fishery Conservation and Management Act for Alternative 3 (Preferred Alternative). Agency documentation is provided in Appendix D (Consultation Correspondence).

3.5.3.4.2 Complete Dismantlement of ex-Enterprise at Commercial Dismantlement Facility

Complete dismantlement would occur in either Brownsville, Texas; Mobile, Alabama, or the Hampton Roads Metropolitan Area, Virginia. Procedures may vary slightly among facilities; however, the framework for assessing impacts are common to all locations. Because the Navy's dismantling contracts require that the dismantling facility obtain all applicable environmental permits prior to commencing the dismantling project, and because of the anticipated low density of marine organisms in the immediate vicinity of this activity, the Navy has determined that the impacts on biological resources resulting from potential water quality degradation are minimal. As for potential impacts of sound introduced in the marine environment during complete dismantlement activities, noise from dismantlement activities would likely be detectable to marine organisms if they were in close proximity to the ship dismantlement facility. However, due to the nature of the required activities, ship dismantlement would occur at highly industrialized locations, with baseline noise conditions elevated well above typical background levels. Therefore, it is unlikely that dismantlement activities associated with the Proposed Action would greatly increase underwater noise levels above baseline levels at these high traffic, industrialized ports. Therefore, the Navy has determined that the potential impacts on biological resources are minimal under Alternative 3 (Preferred Alternative).

Potential Impacts on ESA-Listed Species. Ship dismantling companies that are awarded contracts to tow and dismantle inactive ships are responsible for all work associated with the removal and proper disposal of hazardous materials. Contractors must comply with all applicable federal, state, and local environmental laws and regulations during the processing, use, or disposal of any material under an awarded contract. Shipbreaking companies must submit an Environmental Compliance Plan as part of the bid process. Bidders must demonstrate how the shipbreaking facility would ensure safe and environmentally sound management of all hazardous materials and wastes removed from a ship recycled at the facility, including information for asbestos, Polychlorinated Biphenyls (PCBs), fuels and oils, bilge/ballast water, heavy metals, paints and coatings, waste water/sludge, ozone depleting substances, and other potential hazardous materials. In addition, bidders must certify and/or verify that the dismantling facility has developed, implemented, and maintains a Spill Prevention, Control and Countermeasures Plan and a Stormwater Pollution Prevention Plan. The bidder must also reveal any Notices of Violations, fines or proposed fines, convictions or citations associated with environmental compliance, and whether the bidder has been the subject of any judicial or administrative proceeding related to the violation of any applicable law related to environmental compliance. Based on the requirements for environmental compliance related to the shipbreaking process described above, and the low anticipated density of ESA-listed species in the immediate vicinity of these activities, NMFS made a determination in the 2019 Programmatic Biological Opinion that the potential for effects to ESA-listed species and critical habitats associated with commercial ship breaking (or dismantling) activities is extremely unlikely to occur and thus would be discountable.

3.5.4 Mitigation

This section identifies potential mitigation measures that are not included as part of standard operating procedures or permit requirements specified in Section 3.5.1.3 (Best Management Practices).

The Navy identified the following potential mitigation actions associated with the Proposed Action and alternatives:

- If the Navy selects any of the action alternatives (Alternatives 1, 2, or 3), hull cleaning of ex-Enterprise would be required for the initial transport of ex-Enterprise to commercial dismantlement facilities outside of the Hampton Roads Metropolitan Area. The Navy would implement this measure to reduce the potential for non-indigenous aquatic organisms to be introduced to the Port of Mobile or the Port of Brownsville. Potential impacts of hull cleaning are analyzed under each alternative in Section 3.5.3 (Environmental Consequences).
- If the Navy selects Alternative 2, the Navy would include habitat improvement measures at the Port of Benton barge slip modification area within the Columbia River channel for the benefit of juvenile salmonids. As part of the Proposed Action, the Navy would replace the south jetty with favorable gravel substrate. The expectation is to improve habitat for migrating juvenile salmon. The project would add approximately 7,000 square feet of benthic food production and enhance instream habitat availability.

3.5.5 Summary of Impacts and Conclusions

Table 3.5-2 summarizes the potential impacts of the alternatives on biological resources.

Table 3.5-2: Summary of Impacts and Conclusions on Biological Resources

Potential Impacts on Biological Resources	Alternatives			
	No Action	1	2	3
In-water hull cleaning		◑	◑	◑
Ship strike and tow line strike		◑	◑	◑
Ship noise		○	○	○
Ship strike (heavy-lift ship)		○	○	
Construction-related water quality impacts (Port of Benton Barge Slip)			◑	
Ground disturbance (road modification between Port of Benton barge slip and Trench 94 at the DoE Hanford Site)			○	

Notes: ◑ = Some impact but reduced as a result of project design changes, implementation of current or proposed management practices, monitoring, or mitigation; ○ = minimal impact; Blank = no impact/not applicable

3.6 Air Quality

This section of the Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) describes air quality concerns associated with the Proposed Action. Congress passed the Clean Air Act (CAA) in 1970 and its amendments in 1977 and 1990 to improve air quality and reduce air pollution, which set regulatory limits on air pollutants and helped to ensure basic health and environmental protection from air pollution.

Air pollution damages the health of people, plants, animals, and water bodies as well as the exteriors of buildings, monuments, and statues. It also creates haze or smog that reduces visibility and interferes with aviation.

Air quality is defined by ambient concentrations of specific air pollutants the United States (U.S.) Environmental Protection Agency (EPA) determined may affect the health or welfare of the public and/or environment. The six major pollutants of concern are called "criteria pollutants": carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone, particulate matter (PM) consisting of dust particles less than or equal to 10 microns in diameter (PM_{10}) plus fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb).

The CAA required the EPA to establish National Ambient Air Quality Standards (NAAQS) for these criteria pollutants. These standards set specific concentration limits for criteria pollutants in the outdoor air. The concentration limits were developed because the criteria pollutants are common in outdoor air, considered harmful to public health and the environment, and come from numerous and diverse sources. The concentration limits are designed to aid in protecting public health and the environment. Areas with air pollution problems typically have one or more criteria pollutants consistently present at levels that exceed the NAAQS. These areas are designated as nonattainment for the standards. If the air quality in a geographic area meets or is cleaner than the national standard, it is called an attainment area (designated "attainment/unclassifiable"). Maintenance areas are those previously designated as a nonattainment area and subsequently redesignated to attainment.

Criteria air pollutants are classified as either primary or secondary pollutants based on how they are formed in the atmosphere. Primary air pollutants are emitted directly into the atmosphere from the source of the pollutant. Examples of primary pollutants are the smoke produced by burning wood and volatile organic compounds emitted by industrial solvents. Secondary air pollutants are those formed through atmospheric chemical reactions that usually involve primary air pollutants (or pollutant precursors) and normal constituents of the atmosphere. Ozone is a secondary pollutant that is formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors (volatile organic compounds, nitrogen oxides, and suspended PM_{10}).

Some criteria air pollutants are a combination of primary and secondary pollutants. Particulate matter, including PM_{10} and $PM_{2.5}$, are generated as primary pollutants by various mechanical processes (e.g., abrasion, erosion, mixing, or atomization) or combustion processes. They are generated as secondary pollutants through chemical reactions or through the condensation of gaseous pollutants into fine aerosols.

CO emissions are primarily due to burning of fossil fuel in cars, trucks, and other vehicles or machinery. NO_2 is also primarily released in the air from the burning of fuel in cars, trucks and buses, power plants, and off-road equipment. Sources of lead emissions vary from one area to another. At the national level, major sources of lead in the air are ore and metals processing and piston-engine aircraft operating on leaded aviation fuel. Other sources are waste incinerators, utilities, and lead-acid battery manufacturers.

The highest air concentrations of lead are usually found near lead smelters. The largest source of SO_2 in the atmosphere is the burning of fossil fuels by power plants and other industrial facilities.

In addition to the 6 criteria pollutants, the EPA currently designates 188 substances as hazardous air pollutants under the federal CAA. Hazardous air pollutants are air pollutants known or suspected to cause cancer or other serious health effects, or adverse environmental and ecological effects (EPA, 2016a). NAAQS are not established for these pollutants; however, the EPA has developed rules and control standards that limit emissions of hazardous air pollutants from specific stationary (National Emissions Standards for Hazardous Air Pollutants) and mobile sources (Mobile Source Air Toxics). These emissions are typically one or more orders of magnitude smaller than concurrent emissions of criteria air pollutants.

Ambient air quality is reported as the atmospheric concentrations of specific air pollutants at a particular time and location. The units of measure are expressed as a mass per unit volume (e.g., micrograms per cubic meter [$\mu g/m^3$] of air) or as a volume fraction (e.g., parts per million by volume). The ambient air pollutant concentrations measured at a particular location are determined by the pollutant emissions rate, local meteorology, and atmospheric chemistry. Wind speed and direction, the vertical temperature gradient of the atmosphere, and precipitation patterns affect the dispersal, dilution, and removal of air pollutant emissions from the atmosphere.

This section discusses hazardous air pollutants in relation to the prevalence of the sources emitting these pollutants during activities identified in this EIS/OEIS. Mobile sources operating as a result of the Proposed Action would be functioning over a wide dispersal area, are transient in nature, and are only a minor fraction of the criteria pollutants emissions. As such, the Proposed Action is not anticipated to produce levels of hazardous air pollutants that would indicate need for further review. For these reasons, hazardous air pollutants are not further evaluated in the analysis.

Activities conducted as part of the Proposed Action would involve mobile sources using fossil fuel combustion as a source of power, which results in generation of Greenhouse Gas emissions. Greenhouse Gas emissions are discussed further in Section 3.6.4 (Environmental Consequences).

3.6.1 Air Quality Standards

The current NAAQSs for criteria pollutants are presented in Table 3.6-1. Areas that exceed a standard are in "nonattainment" for that pollutant, while areas that meet a standard are in "attainment" for that pollutant. An area may simultaneously be in nonattainment for some pollutants and in attainment for others. Areas that achieve attainment, after having been in nonattainment, are reclassified as maintenance areas and are required to develop maintenance plans to demonstrate how the area would continue to meet federal air quality standards. Nonattainment areas for some criteria pollutants are further classified as shown below, depending upon the severity of their air quality problem, to facilitate their management:

- ozone—marginal, moderate, serious, severe, and extreme
- carbon monoxide—moderate and serious
- particulate matter—moderate and serious

States, through their air quality management agencies, are required under the CAA to prepare a State Implementation Plan (SIP) to demonstrate how the nonattainment and maintenance areas would achieve and maintain the NAAQS (Table 3.6-1). If the state fails to develop an adequate plan to achieve and maintain the NAAQS, or a SIP revision is not approved by EPA, the EPA would impose a Federal

Implementation Plan. In addition to the NAAQS, individual states are able to develop their own air quality standards that are more stringent than the federal standards.

Table 3.6-1: National Ambient Air Quality Standards

Pollutant		*Primary/ Secondary*	*Averaging Time*	*Level*	*Form*
Carbon monoxide		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead		primary and secondary	Rolling 3-month period	0.15 $\mu g/m^3$ (Note 1)	Not to be exceeded
Nitrogen dioxide		primary	1 hour	100 parts per billion (ppb)	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (Note 2)	Annual mean
Ozone		primary and secondary	8 hours	0.070 ppm (Note 3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (particulate matter)	$PM_{2.5}$	primary	1 year	12.0 $\mu g/m^3$	Annual mean, averaged over 3 years
		secondary	1 year	15.0 $\mu g/m^3$	Annual mean, averaged over 3 years
		primary and secondary	24 hours	35 $\mu g/m^3$	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur dioxide		primary	1 hour	75 ppb (Note 4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Note 1: In areas designated nonattainment for the lead standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 micrograms per cubic meter as a calendar quarter average) also remain in effect.
Note 2: The level of the annual nitrogen dioxide standard is 0.053 parts per million. It is shown here in terms of parts per billion for the purposes of clearer comparison to the 1-hour standard level.
Note 3: Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) ozone standards additionally remain in effect in some areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O3 standards.
Note 4: The previous sulfur dioxide standards (0.14 parts per million 24-hour and 0.03 parts per million annual) would additionally remain in effect in certain areas: (1) any area for which it is not yet one year since the effective date of designation under the current (2010) standards, and (2) any area for which implementation plans providing for attainment of the current (2010) standard have not been submitted and approved and which is designated nonattainment under the previous sulfur dioxide standards or is not meeting the requirements of a State Implementation Plan (SIP) call under the previous sulfur dioxide standards (40 Code of Federal Regulations Part 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.
Notes: PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, ppm = parts per million, $\mu g/m^3$ = micrograms per cubic meter.
Source: EPA (2016b), last updated January 7, 2016.

States may also choose to adopt the Federal Implementation Plan as an alternative to developing their own SIP. Regardless of whether EPA has approved a SIP, federal entities have to comply with all federal, state, and local requirements respecting control and abatement of air pollution.

3.6.2 Methodology

3.6.2.1 Region of Influence

The Study Area for this EIS/OEIS includes offshore and land areas of a number of states, including areas within or over state waters and international waters. These include Newport News, Virginia; the tow route; dismantlement locations; barge route; and land transport routes to waste facilities, as well as land areas several miles adjacent to these areas. State waters extend from the shoreline to 3 nautical miles (nm) from Maine to the east coast of Florida, Alabama, Mississippi, and Louisiana, and to 9 nm for Texas and the Gulf coast of Florida (43 United States Code Section 1301 et seq.*)*. A coastal state exercises sovereignty over its state waters, the air space above it, and the seabed and subsoil beneath it. Some activities of the Proposed Action would occur in state waters and primarily involve shipping and towing on Washington and Oregon state waters and at pier. However, when towing in international waters, most of the Study Area is substantially offshore, beyond state boundaries where attainment status is unclassified and NAAQS do not apply. NAAQS attainment status of adjacent onshore areas would be considered in determining whether appropriate controls for air pollution sources in the adjacent offshore state waters is warranted. Further discussion of the attainment status of the Study Area is provided in Section 3.6.3 (Affected Environment).

Identifying the Region of Influence (ROI) for air quality requires knowledge of the type of pollutant, emission rates of the pollutant source, proximity to other emission sources, and local and regional meteorology. For photochemical pollutants (i.e., made or changed by exposure to sunlight) such as ozone, the impact area may extend much farther (e.g., miles) downwind. The maximum effect of precursors on ozone levels tends to occur several hours after the time of emission during periods of high solar load (i.e., sunlight) and may occur many miles from the source. Ozone and ozone precursors transported from other regions can also combine with local emissions to produce high local ozone concentrations. Therefore, the ROI for air quality includes Newport News, Virginia, the tow route, dismantlement locations, barge route, and land transport routes to waste facilities, as well as land areas several miles adjacent to these areas. These land areas may, from time to time, be downwind from emission sources associated with the Proposed Action. The ROI includes the Air Quality Control Regions (AQCRs) established by the EPA for air quality planning purposes (40 Code of Regulations [CFR] Part 81) that cover the Hampton Roads Metropolitan Area, Virginia; Bremerton and Richland, Washington; and the Department of Energy (DOE) Hanford Site, Washington; Brownsville and Andrews, Texas; Mobile, Alabama; Clive, Utah; and Aiken, South Carolina. Details about each AQCR are presented in Section 3.6.3 (Affected Environment).

Within attainment areas, the U.S. Department of the Navy (Navy) is required to ensure that air quality does not significantly deteriorate as a result of air emissions associated with activities conducted under the Proposed Action.

In contrast, for nonattainment areas, a major source is defined based on the classification of the area under the CAA. Further discussion of major source threshold for nonattainment areas is provided in the following sections under Section 3.6.2.3.1 (General Conformity Evaluation).

3.6.2.2 Approach to Analysis

The air quality impact evaluation requires three separate analysis categories: (1) the CAA General Conformity Analysis; (2) an analysis under the National Environmental Policy Act (NEPA); and (3) an analysis under Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*. The air emissions emitted by federal actions identified under this EIS/OEIS include stationary source emissions from infrastructure improvements and mobile source emissions from construction equipment, land transport, and marine vessel activities within the Study Area. The generated air emissions would be evaluated in one or more of the three identified analysis categories based on the geographical and spatial locations where emissions occur and CAA air quality status (nonattainment, maintenance or attainment) of those respective locations, as well as pollutants emitted, type of emission source and levels of emissions.

Impacts of air pollutants emitted by towing and barging activities in the Pacific Ocean, Atlantic Ocean, Gulf of Mexico, bays, and inland locations in the United States and some state waters (0–3 nm; 0–9 nm for Texas, and the Gulf Coast of Florida) would be evaluated under the CAA General Conformity Rule for only those areas designated as nonattainment or maintenance and only for nonattainment or maintenance criteria pollutants. Impacts of criteria pollutants, hazardous air pollutants and greenhouse gases emitted inland out to 12 nm from this federal action would be evaluated under NEPA. Air pollutants emitted as result of federal action beyond 12 nm would be evaluated under EO 12114. Air pollutants emitted in Texas could travel into Mexico, where the CAA and EO 12114 do not apply. NEPA could apply, since "NEPA law directs federal agencies to analyze the effects of proposed actions to the extent they are reasonably foreseeable consequences of the proposed action, regardless of where those impacts might occur" (CEQ, 1997). However, the analysis for partial and complete dismantlement in 3.6.4 (Environmental Consequences) concludes that any impacts on air quality would be temporary, minor, and localized. Therefore, significant impacts on air quality in Mexico are not anticipated, and potential air quality impacts in Mexico are not evaluated further.

Air impacts due to transportation of non-radiological waste would be similar between alternatives and are within existing normal commercial and public shipyard compliant operations. Therefore, this section analyzes air impacts associated with transportation of radiological waste only.

3.6.2.3 Regulatory Framework

3.6.2.3.1 General Conformity Evaluation

Section 176(c)(1) of the CAA, commonly known as the General Conformity Rule, requires federal agencies to ensure that their actions conform to applicable implementation plans for achieving and maintaining the NAAQS for criteria pollutants for nonattainment and maintenance areas. Federal actions are required to conform with the approved SIP for those areas of the United States designated as nonattainment or maintenance areas for any criteria air pollutants under the CAA (40 CFR Parts 51 and 93 subpart B). The purpose of the General Conformity Rule is to ensure that applicable federal activities do not cause or contribute to new violations of the NAAQS, do not worsen existing violations of the NAAQS, and attainment of the NAAQS is not delayed.

A conformity evaluation must be completed for every applicable Navy action that generates emissions to determine and document whether a Proposed Action complies with the General Conformity Rule.

The General Conformity analysis is separate and distinct from the NEPA analysis. General Conformity is concerned with ensuring that non-permitted projects conform to the SIP. The EIS/OEIS analysis is

concerned with whether an activity significantly affects the human environment. The two analyses are related in that an air impact that violates a SIP is probably "significant."

The first step in the Conformity evaluation is a Conformity Applicability Analysis, which involves calculating the non-exempt direct and indirect emissions associated with the action. If there is no current activity (the Proposed Action is completely new), then the sum of the non-exempt direct and indirect emissions equals the net change in emissions (the current level would be zero). If the action is a change from a current level of emissions, then future emissions are evaluated against the current level, defined as the "current environmental baseline conditions." The net change, then, is the difference between the emissions associated with the action and the current environmental baseline emissions. The net change may be positive, negative, or zero. The emissions thresholds that trigger a Conformity Determination are called *de minimis* levels. The *de minimis* levels for nonattainment and maintenance pollutants under the General Conformity Rule are shown in Table 3.6-2. The net change calculated for the direct and indirect emissions are compared to the *de minimis* levels published in the Conformity Rule. If the net change in emissions does not exceed *de minimis* thresholds, then a General Conformity Determination is not required, and the emissions are presumed to conform to the SIP. If the net change in emissions equal or exceed the *de minimis* threshold values, a General Conformity Determination must be prepared to demonstrate conformity with the approved SIP.

Table 3.6-2: *de minimis* Thresholds

Pollutant	***Nonattainment or Maintenance Area Type***	***de minimis Threshold (TPY)***
Ozone (VOC or NO_X)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO_X)	Marginal and moderate nonattainment inside an ozone transport region	100
	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone transport region	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
CO, SO_2 and NO_2	All nonattainment and maintenance	100
PM_{10}	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
$PM_{2.5}$*	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
Lead (Pb)	All nonattainment and maintenance	25

Notes: CO = carbon monoxide, NO_X = nitrogen oxides, NO_2 = nitrogen dioxide, Pb = lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_2 = sulfur dioxide, TPY = tons per year, VOC = volatile organic compounds. * = There are four main $PM_{2.5}$ precursor pollutants (sulfur dioxide [SO_2], nitrogen oxides [NO_x], volatile organic compounds (VOC), and ammonia [NH_3]).
Source: 40 CFR Parts 93.153(b)(1-2)

If NEPA documentation is prepared for an action, the determination that the Proposed Action is not subject to the General Conformity Rule can be described in that documentation and a signed Record of

Non-Applicability (RONA) for nonattainment areas included in an appendix. Otherwise, no additional documentation is required.

3.6.2.3.2 National Environmental Policy Act

Analysis of health-based air quality impacts under NEPA includes estimates of criteria air pollutants, hazardous air pollutants and greenhouse gases occurring as result of a federal action occurring onshore out to the U.S. territorial sea limits (within 12 nm) for all construction or transport activities or those that involve vessels in U.S. territorial seas. In determining the total direct and indirect emissions caused by the action, agencies must project the future emissions in the area with the action versus the future emissions without the action, which NEPA entitles "the Baseline Condition/Affected Environment." The total direct and indirect emissions consider all emission increases and decreases that are reasonably foreseeable and are possibly controllable through a continuing program responsibility of an agency to affect emissions.

For nonattainment and maintenance criteria pollutants, the conformity *de minimis* levels are useful as NEPA analysis screening thresholds to determine significance. For these pollutants, the General Conformity *de minimis* thresholds are identical to "major source" thresholds applicable to new stationary sources under the federal CAA. As such, they represent reasoned decisions under two regulatory programs as quantities that represent thresholds of increased concern. The thresholds are lowered as the air quality of a nonattainment or maintenance area worsens. For example, the threshold for an ozone precursor is 10 tons per year (TPY) in an extreme nonattainment area, but 100 TPY in a moderate nonattainment area.

The Prevention of Significant Deterioration (PSD) Program was adopted in the CAA under 40 CFR Part 52.21. The PSD Program applies to major stationary sources of air pollutants located in attainment areas, requiring that a source demonstrate that it does not significantly deteriorate the air quality in attainment areas. Under PSD, a "major source" is defined as a facility that emits equal to or greater than 250 tons of a criteria pollutant or regulated precursor. As such, in attainment areas, the major emitting facility threshold of 250 TPY of a pollutant is the threshold of increased concern; therefore, this threshold is also a suitable screening threshold. In NEPA terms, the foregoing means that the thresholds serve as screening level thresholds of significance. That is, where emissions of a pollutant are below the threshold for a nonattainment, attainment or maintenance area, as applicable, they would not be significant—absent compounding factors, such as proximity of sensitive receptors. Where those emissions exceed the applicable threshold discussed above, they demand a harder look at factors such as region of dispersal. It should be noted that the thresholds are conservative in that they are designed to apply to stationary sources. However, the Navy is applying them to sources that may be diffused and dispersed. It should also be noted that by increasing and decreasing with the air quality of a region, these thresholds consider other activities in the region in the past and present. As such they are measures of cumulative impacts.

3.6.2.3.3 Executive Order 12114 Evaluation

The analysis of health-based air quality impacts under EO 12114 includes emission estimates covering all Federal actions outlined under this EIS/OEIS that occur beyond U.S. territorial seas (greater than 12 nm). The EO 12114 air quality evaluation would use the federal CAA "major source" threshold of 250 TPY emissions level as a screening level threshold of significance as described under Section 3.6.2.3.2 (National Environmental Policy Act).

3.6.2.4 Best Management Practices

The Navy is committed to improving energy security and environmental stewardship by reducing reliance on fossil fuels. The Navy is actively developing and participating in energy, environmental, and climate change initiatives that would increase use of alternative energy and reduce emissions of greenhouse gases. The Navy has adopted an energy, environmental, and climate change goal to reduce non-tactical petroleum use; ensure environmentally sound acquisition practices; and ensure environmentally compliant operations for ships, submarines, aircraft, and facilities operated by the Navy. Examples of Navy-wide greenhouse gas reduction projects include energy-efficient construction, thermal and photovoltaic solar systems, geothermal power plants, and the generation of electricity with wind energy. The Navy continues to promote and install new renewable energy projects.

3.6.2.5 Greenhouse Gases

The EPA specifically identified carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride as greenhouse gases (EPA, 2009b) (74 *Federal Register* 66496). Carbon dioxide, methane, and nitrous oxide occur naturally in the atmosphere. These gases influence global climate by trapping heat in the atmosphere that would otherwise escape to space. The heating effect of these gases is considered the probable cause of the global warming observed over the last 50 years (EPA, 2009a). Global warming and climate change affect many aspects of the environment. Not all effects of greenhouse gases are related to climate. For example, elevated concentrations of carbon dioxide can lead to ocean acidification and can stimulate terrestrial plant growth, while methane emissions can contribute to higher ozone levels.

To estimate global warming potential, the United States quantifies greenhouse gas emissions using the 100-year timeframe values established in the *Intergovernmental Panel on Climate Change Fifth Assessment Report* (Intergovernmental Panel on Climate Change, 2014), in accordance with United Nations Framework Convention on Climate Change reporting procedures (United Nations Framework Convention on Climate Change, 2013). The dominant greenhouse gas emitted is carbon dioxide, mostly from fossil fuel combustion (85.4 percent) (EPA, 2015). Weighted by global warming potential, methane is the second-largest component of emissions, followed by nitrous oxide. Global warming potential-weighted emissions are presented in terms of equivalent emissions of carbon dioxide, using units of metric ton. The Proposed Action is anticipated to release greenhouse gases into the atmosphere. These emissions are quantified primarily using methods elaborated upon in the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2018* (EPA, 2020a) for the Proposed Action, and estimates are presented at the end of the discussion for each alternative under Section 3.6.4 (Environmental Consequences). A comparison of greenhouse gas emissions for each alternative, including No Action Alternative, is provided as required the CEQ Final Guidance on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change (CEQ, 2016).

3.6.2.6 Analysis Framework

The air quality impact evaluation requires three separate analyses: the CAA General Conformity Analysis, air analysis under the NEPA, and air analysis under EO 12114. The CAA General Conformity Analysis considers only those criteria air pollutants for which the areas of concern are designated as nonattainment or maintenance, are emitted within 0–3 nm, and are not excluded by rule 40 CFR Part 93 subpart B. Air analysis under the NEPA considers all criteria air pollutants, hazardous air pollutants, and greenhouse gases in both attainment and nonattainment areas within 12 nm. This analysis includes all emissions resulted from the proposed federal action even if the action was exempted under the CAA General Conformity Rule. Air analysis under EO 12114 considers all criteria air pollutants, hazardous air

pollutants, and greenhouse gases in both attainment and nonattainment areas, including all emissions analyzed for the federal action that occur beyond 12 nm.

For this EIS/OEIS, the Navy calculated criteria air pollutants and greenhouse gas emissions under each alternative. For the Proposed Action, hazardous air pollutants are generated, in addition to criteria air pollutants, by combustion of fuels. Fugitive volatile and semivolatile petroleum compounds also may be emitted whenever mechanical devices are used. For these source types, hazardous air pollutant emissions are typically one or more orders of magnitude smaller than concurrent emissions of criteria air pollutants and only become a concern when large amounts of fuel or other materials are consumed during a single activity or in one location. For the Proposed Action, emissions of hazardous air pollutants are intermittent and dispersed over a vast area. Only small quantities of hazardous air pollutants are expected to be emitted with very low potential exposure and health risk. A quantitative evaluation of hazardous air pollutant emissions is therefore not warranted and was not conducted.

Emission factors and schedules for operations were used to calculate total values of each emission type that would be emitted under each alternative. An emission factor represents the mass of a pollutant released into the atmosphere by a given source over a specified period of time. Emission factors can vary considerably depending on type of source, time of day, and schedule of operation. Criteria air pollutants are reported in tons, while greenhouse gases are reported in metric tons per the CAA. The air quality analysis was carried out to calculate amounts of criteria air pollutants and greenhouse gas emissions resulting from the towing of ex-Enterprise to a commercial dismantlement facility (Alternatives 1, 2, and 3); shipment of the propulsion space section from a commercial dismantlement facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF), and reactor compartment package transit from PSNS & IMF to the DOE Hanford Site (Alternatives 1 and 2 [the reactor compartment packaging alternatives]); Port of Benton barge slip modifications and road improvements (Alternative 2); the DOE Hanford Site rail system installation for reactor compartment packages (the reactor compartment packaging alternatives); and land transport routes to waste facilities (Alternative 3, Preferred Alternative). The results of these analyses were then compared to *de minimis* levels to ensure that the project meets the CAA General Conformity Rule requirements. Appendix I (Air Quality Calculations and Record of Non-Applicability) contains a summary of the air quality calculations.

3.6.2.6.1 Emission Sources

Criteria air pollutants are generated by the combustion of fuel by surface vessels and on-road/off-road vehicles and equipment involved in construction or transportation as described in Chapter 2 (Description of Proposed Action and Alternatives). The emissions from these mobile sources depend on combustion of fuel, and emissions are estimated using information provided by the Navy and other reputable, sanctioned sources. Emissions sources and the approach used to estimate emissions under the reactor compartment packaging alternatives are based, wherever possible, on information from Navy subject matter experts and established activity requirements. These data were used to estimate the numbers and types of surface ships and vessels. Emissions were assessed to identify any possibility for the magnitude of Proposed Action emissions to result in a violation of one or more NAAQS. The pollutants for which calculations are made include exhaust total hydrocarbons, carbon monoxide, nitrogen oxides, particulate matter, sulfur dioxide, carbon dioxide, and lead.

The NEPA analysis includes a separate section for a CAA General Conformity Applicability Analysis to support a determination pursuant to the General Conformity Rule (40 CFR Part 93, subpart B). This analysis focuses on activities that could impact nonattainment or maintenance areas within the ROI. As noted above, the Study Area lies partly within or adjacent to some air quality designated areas. To

evaluate whether a General Conformity Determination is required, air pollutant emissions associated with the Proposed Action within the applicable designated nonattainment or maintenance areas are estimated, based on the distribution of ground-based mobile source activity as well as mobile source activities in state waters. The proposed activities within this portion of the Study Area are then compared to the General Conformity Rule *de minimis* thresholds.

3.6.2.6.2 Emission Estimates

3.6.2.6.2.1 Vessel Activities

The methods for estimating ship emissions involve evaluating the type of activity, generating the average steaming hours for ships in each area: within state waters, beyond state waters, and beyond territorial seas. Vessel emissions from river and ocean tug boats and heavy-lift ships were calculated using the *Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emission Inventories Draft Report* (EPA, 2020b) for the propulsion and onboard generation systems. Data from the EPA methodology included emission factors for each type of propulsion and type of onboard generator by ship type, as well as the fuel used. Lead emissions were estimated using the EPA speciation ratio relative to PM_{10} (SNC-Lavalin Environment, 2012). To determine the emissions from vessel activities, the number of vessels was multiplied by the number of one-way trips per transport package multiplied by the total number of packages. This value was then multiplied by the number of hours spent in each range from shore, 0–3 nm, 3–12 nm, 0–9 nm (Texas), 9–12 nm (Texas) and >12 nm. Finally, this value was multiplied by each criteria pollutant's emission factors as calculated in Appendix I (Air Quality Calculations and Record of Non-Applicability). One-way trips were analyzed for commercial tugboats, anticipating that they would be used for other non-project related purposes on their return trips. Return trips for tugboats that would be used to return the Navy barge to PSNS & IMF were analyzed.

3.6.2.6.2.2 Construction Activities

Emissions factors for construction activities (Port of Benton barge slip modifications and transport road improvements) were developed using the EPA Motor Vehicle Emission Simulator (MOVES), version 2014. The Nonroad module of MOVES 2014 was used for anticipated off-road vehicles and equipment. Lead emissions were calculated as a fraction of PM_{10}, based on specification profiles used in the California Air Resources Board (CARB) modeling (CARB, 2021). Emission factors from the EPA MOVES are in grams/operating hour, which were then converted to pounds/operating hour. The following formula was used to determine the total emissions for each piece of equipment:

$$E\ (total\ weight\ emitted) = F\ x\ H\ x\ D\ x\ Q$$

E = Emissions
F = Emissions Factor (lb/hr)
H = Quantity of Hours Operating per Day
D = Quantity of Days Operating
Q = Quantity of Equipment Used

3.6.2.6.2.3 Vehicle Transport Activities

The methods for estimating emissions from vehicle transport of reactor plant components from commercial dismantlement facilities to disposal facilities was similar to construction activities, except emission factors were developed using the On-Road module of MOVES 2014. Lead emissions were calculated as a fraction of PM_{10}, based on specification profiles used in the CARB modeling (CARB, 2021). For a conservative estimate of emissions from vehicle transport, the longest land transport route (2,461 miles [mi.] via highway) was selected, as that would represent the highest level of emissions. At an average speed of 50 miles per hour (mph) and approximately 10 hours of driving per day, a single

transport could travel approximately 500 mi. a day. This results in an average trip duration of five days, traveling 10 hours per day. One-way trips were analyzed for commercial vehicles, anticipating that they would be used for other non-project related purposes on their return trips.

3.6.2.6.2.4 Radiological Emissions

Radiological emissions are addressed in Section 3.1 (Public and Occupational Health and Safety). As such, they are not further discussed in this chapter.

3.6.3 Affected Environment

3.6.3.1 Washington

Some of the pollutant-emitting activities that would result from the Proposed Action would occur in Washington state, as described below. There are no designated areas for lead in Washington state.

3.6.3.1.1 Puget Sound Naval Shipyard & Intermediate Maintenance Facility, Washington

Construction of reactor compartment packages would occur at PSNS & IMF. PSNS & IMF is located in Kitsap County, which is under the jurisdiction of the Puget Sound Clean Air Agency (PSCAA) (King, Kitsap, Pierce and Snohomish counties). Currently, all counties managed by the PSCAA are in attainment for all criteria air pollutants, except the Kent-Seattle-Tacoma PM_{10} maintenance area and the Tacoma-Pierce County $PM_{2.5}$ maintenance area (EPA, 2021f). The 20-year maintenance period for this PM_{10} maintenance area ended on May 14, 2021 (Washington State Department of Ecology, 2021). There would be no transit through these areas for this project.

3.6.3.1.2 Department of Energy Hanford Site and the Port of Benton Barge Slip, Washington

Reactor compartment packages constructed at PSNS & IMF would be transported by barge to the Port of Benton barge slip in Richland, Washington, where each package would then be loaded onto a multiple-wheel, high-capacity transporter and hauled to Trench 94 at the DOE Hanford Site near Richland, Washington. Most of the DOE Hanford Site is within the South-Central Washington Intrastate Air Quality Control Region No. 230, but a small portion of the site is in the Eastern Washington-Northern Idaho Interstate Air Quality Control Region No. 62. All of the areas within Hanford and its surrounding counties are designated as in attainment with NAAQS for criteria air pollutants (40 CFR Part 81.348). PM concentrations can reach relatively high levels in eastern Washington state because of extreme natural events such as dust storms and large brush fires (Navy & DOE, 2012). Dust storms are treated as uncontrollable natural events under EPA policy (EPA, 1996). Accordingly, the air quality impact of such storms can be disregarded in determining whether an area is in attainment for atmospheric particulates.

3.6.3.1.3 Washington Transport Routes

Transport routes within or offshore of the state of Washington include the Pacific Ocean, the Strait of Juan de Fuca and Puget Sound for the transit of the propulsion space section and reactor compartment packages, and the Columbia River for the towing of the reactor compartment packages to the Port of Benton barge slip. The only land route is from the barge slip to Trench 94 at the DOE Hanford Site, the final disposal location for the reactor compartment packages. These routes pass through many counties and clean air agency jurisdictions. The vast majority of these regions are in attainment for all criteria pollutants. However, immediately east of the Columbia River within the area managed by the Department of Ecology, Eastern Regional Office, the Wallula region is currently designated as a maintenance area of PM_{10}. While several jurisdictions near the transport routes currently have maintenance plans (Spokane, Tacoma, Thurston County, and Yakima), the transport routes do not pass through these areas.

3.6.3.2 Virginia

The initial transport phase of the Proposed Action involves towing ex-Enterprise from its current location at Newport News Shipbuilding to one of the three commercial dismantlement locations. In Newport News, Virginia, long-term waterborne protective storage and dismantlement facilities are located within the EPA Hampton Roads AQCR. This region is part of the Hampton Roads Intrastate AQCR No. 223. The Hampton Roads Intrastate AQCR includes the counties of Isle Wright, James, Southampton, and York, as well as the cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg. Currently, all counties and cities in AQCR No. 223 are designated as maintenance for the 1997 8-hour ozone NAAQS and attainment for all other criteria air pollutants, including lead NAAQSs (EPA, 2021e).

3.6.3.3 Texas

Dismantlement in Brownsville, Texas, would occur at a facility located in Cameron County, within the EPA Brownsville-Laredo AQCR No. 213. The Brownsville-Laredo Intrastate AQCR includes the counties of Cameron, Hidalgo, Jim Hogg, Starr, Webb, Willacy, and Zapata. Currently, all counties in AQCR No. 213 are in attainment for all criteria air pollutants (EPA, 2021c).

Disposal of low-level radioactive waste (LLRW) packages could occur at the Waste Control Specialists, LLC site in Andrews, Texas. This site is a part of the Midland-Odessa-San Angelo AQCR No. 218. The Midland-Odessa-San Angelo AQCR consists of 30 counties, including Andrews County. Currently, all counties in AQCR No. 218 are in attainment for all criteria air pollutants (EPA, 2021c).

Collin County and Frisco areas in Texas are the only maintenance areas for lead. The transport routes do not pass through these areas. However, the proposed action may also impact Chambers, Fort Bend, and Harris Counties due to vehicle transit routes. These counties are designated nonattainment for the ozone NAAQS. Impacts of air pollutants emitted by the proposed activities in Mexico is not evaluated since CAA and EO 12114 do not apply. NEPA could apply; however, significant impacts on air quality in Mexico are not anticipated.

3.6.3.4 Alabama

Dismantlement in Mobile, Alabama, would occur at facilities located in Mobile County, which is within the EPA Mobile-Pensacola-Panama City-Southern Mississippi AQCR No. 5. The Mobile-Pensacola-Panama City-Southern Mississippi Interstate AQCR includes three counties in Alabama, 10 counties in Florida, and 37 counties in Mississippi. Currently, all counties in AQCR No. 5 are in attainment for all criteria air pollutants (EPA, 2021a). Pike County, Alabama, is the only nonattainment area for lead in Alabama. The transport route does not pass through this area.

3.6.3.5 South Carolina

Waste disposal in South Carolina would occur at the DOE-Savannah River Site in Aiken, located in Aiken County, in western South Carolina. This county is in attainment for all criteria pollutants (EPA, 2021b).

3.6.3.6 Utah

Waste disposal in Utah would occur at EnergySolutions in Clive, Utah, located in the West Desert of Utah approximately 75 mi. west of Salt Lake City. Clive is an unincorporated community in Tooele County, Utah. Tooele county is in nonattainment with the 2015 8-Hour Ozone standard, 2006 $PM_{2.5}$ standard, and 1971 Sulfur Dioxide NAAQS (EPA, 2021d).

3.6.3.7 Transport Routes Between Commercial Dismantlement Facilities and Disposal Facilities

Alternative 3 (Preferred Alternative) involves the transport of the radioactive materials from the commercial dismantlement facility to one of three potential waste disposal facilities. Nonattainment areas and maintenance areas that could be transited through are listed in Table 3.6-3. Potential vehicle transit routes are provided for information only. This activity is performed by private contractors; therefore, the emissions are not subject to analysis in this Final EIS/OEIS.

Table 3.6-3: Nonattainment and Maintenance Areas Along Vehicle Transit Routes

Pollutant	County	Area Name	Attainment Status	*de minimis* Threshold (TPY)
8-Hour Ozone	Davis County	Northern Wasatch Front, Utah	Marginal	NOx: 100 VOC: 100
	Salt Lake County	Northern Wasatch Front, Utah	Marginal	NOx: 100 VOC: 100
	Tooele County	Northern Wasatch Front, Utah	Marginal	NOx: 100 VOC: 100
	Utah County	Southern Wasatch Front, Utah	Marginal	NOx: 100 VOC: 100
	Weber County	Northern Wasatch Front, Utah	Marginal	NOx: 100 VOC: 100
	Fort Bend County	Houston-Galveston-Brazoria, Texas	Serious	NOx: 50 VOC: 50
	Harris County	Houston-Galveston-Brazoria, Texas	Serious	NOx: 50 VOC: 50
	Chambers County	Houston-Galveston-Brazoria, Texas	Serious	NOx: 50 VOC: 50
Carbon Monoxide	Salt Lake County	Salt Lake City, Utah	Maintenance	100
	Utah County	Provo, Utah	Maintenance	100
PM_{10}	Salt Lake County	Salt Lake City, Utah	Maintenance	100
	Utah County	Provo, Utah	Maintenance	100
$PM_{2.5}$	Box Elder County	Salt Lake City, Utah	Serious	70
	Davis County	Salt Lake City, Utah	Serious	70
	Salt Lake County	Salt Lake City, Utah	Serious	70
	Tooele County	Salt Lake City, Utah	Serious	70
	Utah County	Provo, Utah	Serious	70
	Weber County	Salt Lake City, Utah	Serious	70
Sulfur Dioxide	Salt Lake County	Salt Lake Co, Utah	Primary, Secondary	100
	Tooele County	Tooele Co, Utah	Primary, Secondary	100

Notes: PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, TPY = tons per year, VOC = volatile organic compounds, NOx = nitrogen oxides. (EPA, 2021b, 2021c, 2021d)

3.6.4 Environmental Consequences

3.6.4.1 No Action Alternative

As described in Chapter 2 (Description of Proposed Action and Alternatives), under the No Action Alternative, ex-Enterprise would not be towed, dismantled, or disposed of, but rather remain in waterborne storage for an indefinite time period at its current location in Newport News Shipbuilding in Newport News, Virginia. The vessel would undergo periodic maintenance to ensure that storage

continues in a safe and environmentally acceptable manner. Air emissions associated with periodic maintenance are expected to be minimal and covered under any existing facility air permits. No other long-term increases in emissions would occur, as no new stationary sources would be constructed. Therefore, no significant air quality impacts would occur under the No Action Alternative.

3.6.4.2 Alternative 1: Single Reactor Compartment Packages

3.6.4.2.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

As described in Chapter 2 (Description of Proposed Action and Alternatives), ex-Enterprise would be towed from its current berthing location at Newport News Shipbuilding in Newport News, Virginia, to one of three commercial dismantlement locations in Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama, for partial dismantlement of ex-Enterprise. Although three potential routes to commercial dismantlement facility are possible, the longest route (from Newport News Shipbuilding in Newport News, Virginia, to Brownsville, Texas) was selected for a conservative analysis of criteria pollutants emissions. Shorter routes are anticipated to have a smaller potential impact. A portion of Alternative 1 of the Proposed Action involves towing ex-Enterprise from its current location at Newport News Shipbuilding to one of the three commercial locations for partial or complete dismantlement. Vessels performing this action would transit through the Hampton Roads AQCR No. 223, which is a Maintenance Area for the 1997 8-hour Ozone NAAQS. As a result, Proposed Action emissions were evaluated to assess compliance with the General Conformity Rule *de minimis* thresholds for Oxides of Nitrogen (NO_x) and Volatile Organic Compounds (VOC) in Section 3.6.4.2.7 (General Conformity Under Alternative 1). The towing operation would result in a minimal and temporary increase of marine vessel emissions (Table 3.6-4).

Table 3.6-4: Estimated Criteria Pollutant Emissions Produced Under Alternative 1 from Transport of ex-Enterprise to Commercial Dismantlement Facility

Region	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
0–3 nautical miles (nm)	0.12	0.49	0.01	0.002	0.02	0.017	2.62E-06
3–12 nm	0.08	0.31	0.01	0.002	0.01	0.01	1.69E-06
0–9 nm (Texas)	0.04	0.16	0.003	0.001	0.006	0.006	8.52E-07
9–12 nm (Texas)	0.1	0.06	0.001	0.000	0.002	0.002	3.07E-07
0–12 nm	0.19	0.80	0.01	0.004	0.03	0.03	4.31E-06
>12 nm	7.80	32.43	0.57	0.16	1.16	1.13	1.75E-04
Total	8.33	34.25	0.60	0.17	1.23	1.20	1.85E-04

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds). [2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC. [3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).
Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds. Individual values may not add up exactly to total values due to rounding.

No long-term increases in emission would occur, as no new stationary sources would be constructed.

3.6.4.2.2 Partial Dismantlement at Commercial Dismantlement Facility

Once at the commercial dismantlement location, the selected contractor would dispose of ex-Enterprise by partially dismantling and recycling it using established processes and techniques. The aircraft carrier dismantling contracts include a clause that requires the contractor to comply with all applicable federal,

state, and local environmental, occupational safety and health laws and regulations. The dismantling/recycling would occur at an existing industrial facility that is capable of the operation with current operational credentials and permitting that would allow them to conduct the dismantling based on established processes and techniques. Activities associated with dismantling/recycling of ex-Enterprise are expected to be similar to current and ongoing activities at the existing industrial facility.

Ship recycling activities can generate air pollutants that are regulated by the CAA. If a ship recycling facility emits regulated amounts of air pollutants, it must obtain the appropriate operating or preconstruction permit and comply with all emissions requirements set forth in that permit. Specifically, torch cutting may generate large amounts of fumes and some or all of the following materials as particulates: manganese, nickel, chromium, iron, aluminum, asbestos, and lead. It may also initiate small fires when oil or sludge is ignited by the torch. These fires are usually short-lived but may generate some intense black smoke. The cutting torches themselves can generate oxides of nitrogen and sulfur, and the process of combustion produces carbon dioxide and carbon monoxide. In spite of these releases, air pollutants from metal cutting are not likely to have a major air quality impact (EPA, 2000).

In general, ship recycling activities could result in temporary minor, localized impacts on air quality. However, ship dismantling activities that comply with applicable rules and regulations would not significantly impact air quality.

3.6.4.2.3 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility

The propulsion space section, which contains the eight reactor plants, would be separated from the rest of ex-Enterprise at the commercial dismantlement facility and transported to PSNS & IMF in Washington for processing and disposal.

The heavy-lift ship would leave the commercial dismantlement facility, navigate around the southern tip of South America, and transit north to the U.S. West Coast, continuing up the coast to northwestern Washington and into the Strait of Juan de Fuca, then south through Puget Sound, ultimately arriving at PSNS & IMF (Figure 2-5). While the heavy-lift ship transit would be to the central basin of Puget Sound and the propulsion space section would be brought into port by tugboat, calculations are based as if the heavy-lift ship would transit to PSNS & IMF as a conservative analysis for air emissions.

Although there are three potential routes from the commercial dismantlement facility to PSNS & IMF, the longest route (from the commercial dismantlement facility in Brownsville, Texas to PSNS & IMF) was selected for analysis of criteria pollutants emissions. Shorter routes are anticipated to have a smaller potential impact. Of the approximately 23,646 nm transit, 143 nm are estimated to occur between shore and 12 nm. Of that, approximately, 50 nm would occur between 0 and 3 nm. Most of the distance within 3 nm of shore occurs during transit through the Strait of Juan de Fuca into PSNS & IMF. The distance between 3 and 12 nm occurs as the heavy lift ship leaves port into the Gulf of Mexico, within a portion of the waters as it transits between Florida and the Bahamas, and during the portion of the journey in the Strait of Juan de Fuca before it gets to the Port Angeles region. In Texas, the heavy-lift ship would transit only 10 nm within 9 nm of shore and only 4 nm between 9 and 12 nm as the vessel departs from Brownsville and travels into the Gulf of Mexico. These distances were estimated based on Figure 2-5. The remainder of the transit would be outside 12 nm from shore, along typical shipping lanes in international waters. Air emissions from this activity of the transit are shown in Table 3.6-5. The distances assumed within 3 nm of shore represent the “worst case” scenario heavy-lift ship activities occurring near the shore.

Table 3.6-5: Estimated Criteria Pollutant Emissions Produced Under Alternative 1 from Heavy-Lift Transit

Region	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
0–3 nautical miles (nm)	0.21	2.33	0.09	0.01	0.03	0.03	4.45E-07
3–12 nm	0.39	4.33	0.16	0.01	0.06	0.05	8.27E-07
0–9 nm (Texas)	0.04	0.42	0.016	0.001	0.006	0.005	8.10E-08
9–12 nm (Texas)	0.01	0.15	0.006	0.000	0.002	0.002	2.92E-08
0–12 nm	0.60	6.67	0.25	0.019	0.09	0.08	1.27E-06
>12 nm	99.07	1,095.49	41.42	3.17	14.93	13.74	2.09E-04
Total	99.67	1,102.16	41.67	3.19	15.02	13.82	2.10E-04

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds.

Individual values may not add up exactly to total values due to rounding.

3.6.4.2.4 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages (No In-Water Work)

Reactor compartment package construction would occur at PSNS & IMF, within 3 nm from shore (Figure 2-4). This work is expected to be performed within the available resources of the shipyard (e.g., manpower, facilities). As described in the *Final Environmental Assessment on the Disposal of Decommissioned, Defueled Naval Reactor Plants from USS Enterprise (CVN 65)* (Navy & DOE, 2012), hereinafter referred to as the 2012 EA, all PSNS & IMF work is conducted per PSNS & IMF Air Quality Permit, which incorporates all EPA, Washington state, and regional air pollution authority (PSCAA) requirements applicable to shipyard operations. As discussed in the 2012 EA (Navy & DOE, 2012), the volume of metal to be cut and processed—the primary source of emissions during reactor compartment package preparation—is less (for ex-Enterprise over the six to eight years' time period through which the work would be concentrated) than historic peak workloads at PSNS & IMF, when up to 10 submarines per year underwent reactor compartment disposal and remnant hull recycle. In addition, increased efficiency in the metal cutting processes—such as the increased use of mechanical saws instead of cutting torches—reduces air emissions for the same volume of metal cut/processed as compared to the past. Ex-Enterprise reactor compartment package construction would not be expected to result in a significant degradation of air quality in the areas surrounding PSNS & IMF.

3.6.4.2.5 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

PSNS & IMF would use a concrete rail support system to place the reactor compartment packages in Trench 94 at the DOE Hanford site. Additional rail structures would be added within Trench 94 at the DOE Hanford site to support the single reactor compartment packages, requiring limited excavation of the trench floor. Construction for Trench 94 rail installation would involve the use of diesel-powered

heavy equipment for limited excavation and site preparation and cleanup. Temporary air quality impacts are expected, but overall emissions would be minimal (Table 3.6-6).

Additionally, during the excavation work, the contractor would enforce the following actions to control fugitive dust:

- use water suppressants
- minimize activities during periods of high winds
- use covered chutes, covered containers, or collection control equipment when handling, transferring, and/or storing dusty material
- keep paved surfaces clean to minimize re-entrainment of dust into the air
- restrict access or limit vehicle speeds on unpaved areas to 15 mph
- limit the amount excavated at any one time, as needed

3.6.4.2.6 Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility by Barge to the Port of Benton Barge Slip and by Multiple-Wheel, High-Capacity Transporters to Trench 94 of Department of Energy Hanford Site

Once the reactor compartment packages are ready, each would be transported by barge to the Port of Benton barge slip via the Columbia River and from the barge slip via multiple-wheel, high-capacity transporter to the waste facility at Trench 94 at the DOE Hanford Site. Total duration of transport from PSNS & IMF to Trench 94 at the DOE Hanford Site is approximately eight weeks over a one-and-a-half year period. The transport route for the ex-Enterprise reactor compartment packages would be the same as that used for the current submarine and cruiser reactor compartment packages and has been used for numerous packages with minimal associated air impacts (Navy & DOE, 1996, 2012). Alternative 1 does not propose to change the methodologies or compliance with any applicable federal, state, and local environmental and occupational safety and health laws and regulations. Air emissions from this activity of the transit are shown in Table 3.6-6.

Table 3.6-6: Estimated Total Criteria Pollutant Emissions Produced Under Alternative 1 from Transport of Reactor Compartment Packages to the DOE Hanford Site

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
0–3 nautical miles (nm)							
Shipment via ocean tug from PSNS & IMF to Vancouver, Washington	7.79	32.41	0.57	0.16	1.16	1.129	1.75E-04
Shipment via river tug from Vancouver, Washington, to Port of Benton barge slip	4.40	14.98	0.23	0.10	0.65[4]	0.632	9.77E-05
Install rail system for Reactor Compartment Packages in Trench 94 at the DOE Hanford Site	0.0580	0.0069	0.0003	4.98E-05	0.0002	0.0002	1.52E-09
Land transport via multiple-wheel, high-capacity transporters from Port of Benton barge slip to Trench 94 at the DOE Hanford Site	0.37	1.61	0.12	0.00	0.04	0.04	1.67E-06
TOTAL 0–3 nm	12.62	49.01	0.92	0.26	1.86	1.80	2.74E-04
3–12 nm							
Shipment via ocean tug from PSNS & IMF to Vancouver, Washington	1.04	4.31	0.08	0.02	0.15	0.15	2.32E-05
TOTAL 3–12 nm	1.04	4.31	0.08	0.02	0.15	0.15	2.32E-05
0–12 nm							
Transport of Reactor Compartment Packages to Trench 94 at the DOE Hanford Site (including rail system installation)	13.66	53.32	1.00	0.28	2.01	1.95	2.97E-04
TOTAL 0–12 nm	13.66	53.32	1.00	0.28	2.01	1.95	2.97E-04
>12 nm							
Shipment via ocean tug from PSNS & IMF to Vancouver, Washington	3.58	14.88	0.26	0.07	0.53	0.52	8.01E-05
TOTAL >12 nm	3.58	14.88	0.26	0.07	0.53	0.52	8.01E-05

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds, DOE = Department of Energy, PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility.

Emissions evaluated under General Conformity (those occurring within the Wallula region PM_{10} maintenance area) are included in the total PM_{10} emissions. See Table 3.6-8. Individual values may not add up exactly to total values due to rounding.

3.6.4.2.7 General Conformity Under Alternative 1

As majority of pollutants emitted from the transit activities in the Study Area under Alternative 1 will occur more than 12 nm offshore, and natural atmospheric mixing would substantially disperse pollutants. Impacts of all the air pollutants (criteria air pollutants, hazardous air pollutants, and greenhouse gases) emitted beyond 12 nm limits would be evaluated under EO 12114. The same air pollutants emitted (all criteria air pollutants, hazardous air pollutants and greenhouse gases) which occur inland out to the 12 nm limits would be evaluated under NEPA.

However, some pollutants from the proposed federal actions that will be emitted inland to U.S. State Waters boundaries (0–3 nm; 0–9 nm for Texas, and the Gulf Coast of Florida) could be carried ashore by winds impacting areas that are designated by the CAA as being either nonattainment or maintenance. Such designated nonattainment or maintenance areas would be evaluated under the CAA General Conformity Rule for only those criteria air pollutants (and precursors) that have identified as being either/or a nonattainment or maintenance pollutant(s) for those designated areas.

The net emissions [Net emissions = Total Emissions (Direct + Indirect) minus (No Action)] associated with the Proposed Action are compared to the General Conformity *de minimis* thresholds for nonattainment/maintenance areas to make a conformity determination. Table 3.6-7 and 3.6-8 present the estimated air emissions subject to General Conformity under Alternative 1. The only relevant emissions are those that occur within the Hampton Roads AQCR, Virginia, which is a maintenance area for the 1997 8-hour ozone and the Wallula, Washington region, which is a maintenance area for PM_{10}.

As discussed in Section 3.6.3.2 (Virginia), the Hampton Roads AQCR, Virginia, is a maintenance area for the 1997 8-hour ozone NAAQS. In this area, emissions associated with the Proposed Action would result from towing the ex-Enterprise from its current location at Newport News Shipbuilding to one of the three commercial locations for partial dismantlement. As shown in Table 3.6-7, air pollutant emissions due to this activity under Alternative 1 would not result in violations of federal air quality standards because they would be well below the applicable *de minimis* levels. A signed RONA has been prepared and presented in Appendix I (Air Quality Calculations and Record of Non-Applicability) to document this conformity determination.

As discussed in Section 3.6.3.1.3 (Washington Transport Routes), the Wallula, Washington region is a maintenance area for PM_{10} under the NAAQS. In this area, emissions associated with the Proposed Action would result from towing the barge with the reactor compartment package to the Port of Benton barge slip. With an anticipated barge transit speed of 8 mph, the barge would travel 12 mi. through this maintenance area in approximately 1.5 hours per vessel per package and contribute an extremely low level of PM_{10} or other criteria pollutants. As shown in Table 3.6-8, air pollutant emissions under Alternative 1 would not result in violations of federal air quality standards because they would be well below the applicable *de minimis* levels. A signed RONA has been prepared and presented in Appendix I (Air Quality Calculations and Record of Non-Applicability) to document this conformity determination.

Table 3.6-7: Estimated Annual Emissions Produced Between 0 and 3 nm of Shore Under Alternative 1 – Hampton Roads AQCR, Virginia, Ozone Maintenance Area

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
0–3 nautical miles (nm)							
Tow of ex-Enterprise to Commercial Dismantlement Facility	N/A	0.49	0.01	N/A	N/A	N/A	N/A
Nonattainment/Maintenance de minimis Levels	N/A	100	100	N/A	N/A	N/A	N/A
Exceeds de minimis Level?	N/A	No	No	N/A	N/A	N/A	N/A

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds.

Individual values may not add up exactly to total values due to rounding.

Table 3.6-8: Estimated Annual Emissions Produced Between 0 and 3 nm of Shore Under Alternative 1 – Wallula, Washington, PM_{10} Maintenance Area

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
0–3 nautical miles (nm)							
River Tugs through Wallula PM_{10} Maintenance Area	N/A	N/A	N/A	N/A	0.03	N/A	N/A
Nonattainment/Maintenance de minimis Levels	N/A	N/A	N/A	N/A	100	N/A	N/A
Exceeds de minimis Level?	N/A	N/A	N/A	N/A	No	N/A	N/A

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds.

Individual values may not add up exactly to total values due to rounding.

3.6.4.2.7.1 National Environmental Policy Act Impacts from Criteria Pollutants Under Alternative 1 for 0–12 Nautical Miles from Shore

Table 3.6-9 presents the total estimated emission results under Alternative 1 within 12 nm of the coastline. Pollutants emitted in the Study Area under Alternative 1 could be carried ashore by winds. However, the majority of transit activities would occur more than 12 nm offshore, and natural mixing would substantially disperse pollutants before they reach the coastal land mass. When using the PSD major emitting facility numbers as screening thresholds, any relevant increases would be well below the thresholds. In addition, the total quantity of criteria pollutants is very small in relation to the vastness of the Study Area (Figure 2-5 and 2-6). Therefore, no significant impacts on air quality would occur as a result of criteria pollutants emissions from activities beyond territorial activities.

Table 3.6-9: Estimated Annual Criteria Pollutant Emissions Produced Between 0 and 12 nm from Shore Under Alternative 1

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
Tow of ex-Enterprise to Commercial Dismantlement Facility	0.19	0.80	0.01	0.004	0.03	0.03	4.31E-06
Heavy-Lift ship from Commercial Dismantlement Facility to PSNS & IMF	0.60	6.67	0.25	0.019	0.09	0.08	1.27E-06
Shipment via ocean tug from PSNS & IMF to Vancouver, Washington	8.83	36.72	0.65	0.18	1.32	1.28	1.98E-04
Shipment via river tug from Vancouver, Washington, to Port of Benton barge slip	4.40	14.98	0.23	0.10	0.65[4]	0.632	9.77E-05
Install rail system for Reactor Compartment Packages in Trench 94 at the DOE Hanford Site	0.0580	0.0069	0.0003	4.98E-05	0.0002	0.0002	1.52E-09
Land transport via multiple-wheel, high-capacity transporters from Port of Benton barge slip to Trench 94 at the DOE Hanford Site	0.37	1.61	0.12	0.00	0.04	0.04	1.67E-06
TOTAL	14.45	60.78	1.27	0.30	2.13	2.06	3.03E-04
PSD Major Source Threshold	**250**	**250**	**250**	**250**	**250**	**250**	**250**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds, DOE = Department of Energy, PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility.

Emissions evaluated under General Conformity (those occurring within the Wallula region PM_{10} maintenance area) are included in the total PM_{10} emissions. See Table 3.6-8. Individual values may not add up exactly to total values due to rounding.

3.6.4.2.7.2 Executive Order 12114 Impacts from Criteria Pollutants Under Alternative 1 Greater than 12 nm from Shore

The majority of transit activities would occur more than 12 nm offshore, and natural mixing would substantially disperse pollutants before they reach the coastal land mass.

Table 3.6-10 presents the total estimated emission results under Alternative 1 beyond 12 nm within the Study Area and includes all emissions generated, regardless of proximity to the coastline. When using

the PSD major emitting facility numbers as screening thresholds, any relevant increases, with the exception of NO_x, would be well below the thresholds. It should be noted that these emissions are estimated to occur beyond 12 nm over the entire transit from around the southern tip of South America, north to the U.S. West Coast, continuing up the coast to northwestern Washington and into the Strait of Juan de Fuca, then south through Puget Sound, ultimately arriving at PSNS & IMF, a distance of over 23,000 miles. The total quantity of criteria pollutants in any one location is very small in relation to the vastness of the Study Area. Therefore, no significant impacts on air quality are anticipated to occur as a result of criteria pollutants emissions from activities beyond territorial activities.

Table 3.6-10: Estimated Annual Criteria Pollutant Emissions Produced Greater than 12 nm from Shore Under Alternative 1

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
Tow of ex-Enterprise to Commercial Dismantlement Facility	7.80	32.43	0.57	0.16	1.16	1.13	1.75E-04
Heavy-Lift ship from Commercial Dismantlement Facility to PSNS & IMF	99.07	1,095.49	41.42	3.17	14.93	13.74	2.09E-04
Shipment via ocean tug from PSNS & IMF to Vancouver, Washington	3.58	14.88	0.26	0.07	0.53	0.52	8.01E-05
TOTAL	110.44	1142.80	42.26	3.41	16.63	15.39	4.64E-04
PSD Major Source Threshold	**250**	**250**	**250**	**250**	**250**	**250**	**250**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).
[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.
[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)
Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds, DOE = Department of Energy, PSD = Prevention of Significant Deterioration, PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility.
Individual values may not add up exactly to total values due to rounding.

3.6.4.2.8 Greenhouse Gases

Under Alternative 1, emissions have been compared with the nationwide greenhouse gas inventory carbon dioxide equivalent (CO_2e) emissions for potential significance (Table 3.6-11). Estimated greenhouse gas emission increases associated with operations due to implementation of Alternatives 1 would be less than 0.001 percent of greenhouse gas inventory of 6,667 million metric tons of CO_2e.

Table 3.6-11: Estimated Annual Greenhouse Gas Emissions Under Alternative 1

Emissions of CO_2e (Metric Tons per Year)	
Alternative 1 Greenhouse Gas Emissions	55,534
National Greenhouse Gas Emissions	6,667,000,000
Percent of National Emissions	0.000833%

Note: CO_2e = carbon dioxide equivalent

3.6.4.3 Alternative 2: Dual Reactor Compartment Packages

Under Alternative 2, all components of the activity (towing, dismantlement, relocation of the propulsion space section, preparation of the reactor compartment disposal packages, and transport to waste facility) are similar to those under Alternative 1. Because Alternative 2 proposes the construction of four reactor compartment packages instead of eight single ones, the Port of Benton barge slip would require modifications to its barge slip as well as improvements to the road between the barge slip and Trench 94 at the DOE Hanford Site to facilitate the passage of the larger dual reactor compartment packages. There would also be a reduction in transits between PSNS & IMF and Trench 94 at the DOE Hanford Site (from 8 to 4), which would reduce the air emissions from transit activities.

3.6.4.3.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

As described above, the ex-Enterprise would be towed from its current berthing location at Newport News Shipbuilding, to one of three commercial dismantlement facilities. This towing activity is the same as under Alternative 1. The towing operation would result in a minimal and temporary increase of marine vessel emissions (see Table 3.6-4). No long-term increases in emission would occur, as no new stationary sources would be constructed.

3.6.4.3.2 Partial Dismantlement at Commercial Dismantlement Facility

As with Alternative 1, once at a dismantlement location, the selected contractor would dispose of ex-Enterprise by partially dismantling and recycling it according to established processes and techniques. Ship recycling activities could result in temporary minor, localized impacts on air quality. However, ship dismantling activities that comply with applicable rules and regulations would not significantly impact air quality under Alternative 2.

3.6.4.3.3 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility

The shipment of the propulsion space section would occur as described in Alternative 1 (Section 3.6.4.2.3). Air emissions from this activity of the transit would be the same as Alternative 1, and are shown in Table 3.6-5.

3.6.4.3.4 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Four Dual Reactor Compartment Packages (No In-Water Work)

Reactor compartment package preparation would occur at PSNS & IMF. Unlike Alternative 1, Alternative 2 would prepare and ship four dual reactor compartment packages to the Port of Benton barge slip by barge and from there to the DOE Hanford Site by multiple-wheel, high-capacity transporters.

3.6.4.3.5 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

Installation of rail system for Reactor Compartment Packages in Trench 94 at the DOE Hanford Site would occur as described in Alternative 1. Air emissions from this activity of the transit are shown in Table 3.6-12.

3.6.4.3.6 Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility by Barge to the Port of Benton Barge Slip and by Multiple-Wheel, High-Capacity Transporter to Trench 94 of Department of Energy Hanford Site

The transport route for the ex-Enterprise reactor compartment packages would be the same as that used for Alternative 1, only with a reduced number of shipments when compared with Alternative 1. For Alternative 2, total duration of transport from PSNS & IMF to Trench 94 at the DOE Hanford Site is

expected to be four to six weeks over a 1.5-year period. Alternative 2 does not propose to change the methodologies or compliance with any applicable federal, state, and local environmental, occupational safety and health laws and regulations. Therefore, preparation and shipment of the reactor compartment packages under Alternative 2 would have minimal effects on air quality.

Table 3.6-12: Estimated Total Criteria Pollutant Emissions Produced Under Alternative 2 from Transport of Reactor Compartment Packages to the DOE Hanford Site

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
0–3 nautical miles (nm)							
Shipment via ocean tug from PSNS & IMF to Vancouver, Washington	3.90	16.20	0.29	0.08	0.58	0.564	8.73E-05
Shipment via river tug to Port of Benton barge slip	2.20	7.49	0.11	0.05	0.33[4]	0.316	4.89E-05
Construction Activities (rail system installation, barge slip modifications, and transport route improvements)	0.35	0.69	0.11	0.00	0.04	0.04	3.66E-07
Land transport from Port of Benton barge slip to Trench 94 at the DOE Hanford Site	0.18	0.80	0.06	0.00	0.02	0.02	8.37E-07
TOTAL 0–3 nm	6.63	25.19	0.57	0.13	0.96	0.94	1.37E-04
3–12 nm							
Shipment via ocean tug from PSNS & IMF to Vancouver, Washington	0.52	2.16	0.04	0.01	0.08	0.08	1.16E-05
TOTAL 3–12 nm	0.52	2.16	0.04	0.01	0.08	0.08	1.16E-05
0–12 nm							
Transport of Reactor Compartment Packages to Trench 94 at the DOE Hanford Site (including construction activities)	7.15	27.34	0.61	0.14	1.04	1.01	1.49E-04
TOTAL 0–12 nm	7.15	27.34	0.61	0.14	1.04	1.01	1.49E-04
>12 nm							
Shipment via ocean tug from PSNS & IMF to Vancouver, Washington	1.79	7.44	0.13	0.04	0.27	0.26	4.01E-05
TOTAL >12 nm	1.79	7.44	0.13	0.04	0.27	0.26	4.01E-05

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: (1) CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds, DOE = Department of Energy, PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility. Emissions evaluated under General Conformity (those occurring within the Wallula region PM_{10} maintenance area) are included in the total PM_{10} emissions. See Table 3.6-15. Individual values may not add up exactly to total values due to rounding. Construction emissions are shown separately in Table 3.6-13.

3.6.4.3.7 Port of Benton Barge Slip Modifications

Alternative 2 would require modifications to the existing Port of Benton barge slip on the west shoreline of the Columbia River in Richland, Washington. The barge slip would be modified to accommodate the

larger barge needed for dual reactor compartment packages. Construction for the barge slip modifications would involve the use of diesel-powered heavy equipment for limited excavation, delivery or removal of materials, driving steel piles, concrete mixing, and backfilling of excavated areas. Temporary air quality impacts are expected, but overall emissions would be minimal (Table 3.6-13).

3.6.4.3.8 Road Improvements Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site

Additionally, the Navy may require upgrades at 11 locations on the transport route to support dual reactor compartment packages.

The proposed upgrades to the route include the following activities:

- cutting and/or filling to reduce the vertical curve
- filling dips in road
- paving medians
- filling low sides and/or cutting high sides to reduce side slope
- filling road shoulders to improve transitions (intersections)

Construction for the road upgrades would involve the use of diesel-powered heavy equipment for limited excavation, delivery of materials, backfilling of excavated areas, and paving of the roadway. Temporary air quality impacts are expected, but overall emissions would be minimal (Table 3.6-13). Additionally, during barge slip or road improvement work, the contractor would enforce the following actions to control fugitive dust:

- use water suppressants
- minimize activities during periods of high winds
- use covered chutes, covered containers, or collection control equipment when handling, transferring, and/or storing dusty material
- keep paved surfaces clean to minimize re-entrainment of dust into the air
- restrict access or limit vehicle speeds on unpaved areas to 15 mph
- limit the amount graded at any one time

Table 3.6-13: Estimated Criteria Pollutant Emissions Produced Under Alternative 2 from Construction Activities

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
Install rail system for Reactor Compartment Packages in Trench 94 at the DOE Hanford Site	0.0580	0.0069	0.0003	4.98E-05	0.0002	0.0002	1.52E-09
Port of Benton barge slip modifications	0.06	0.14	0.02	0.00	0.01	0.01	7.95E-08
Improvements to Transport Route	0.23	0.54	0.09	0.00	0.03	0.03	2.85E-07
Total Emissions	0.35	0.72	0.11	0.00	0.04	0.04	3.88E-07

Table 3.6-13: Estimated Criteria Pollutant Emissions Produced Under Alternative 2 from Construction Activities (continued)

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).
[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.
[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)
Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds, DOE = Department of Energy.
Individual values may not add up exactly to total values due to rounding.

3.6.4.3.9 General Conformity Under Alternative 2

Transit activities between the port locations and 3 nm offshore would potentially generate emissions that could impact air quality within the air basin. These emissions are expected to be less than those generated under Alternative 1, since under Alternative 2 four fewer transits of the reactor compartment packages would occur. Table 3.6-14 and Table 3.6-15 present the estimated nearshore emissions under Alternative 2. For General Conformity purposes, the only relevant emissions are those that occur within the Hampton Roads AQCR, Virginia, which is a maintenance area for the 1997 8-hour ozone and the Wallula, Washington region, which is a maintenance area for PM_{10}. Air pollutant emissions under Alternative 2 would not result in violations of federal air quality standards, because they would not have a measurable impact on air quality in land areas. Emissions are below the applicable *de minimis* levels. A Conformity Determination is not required, and a signed RONA has been prepared and presented in Appendix I (Air Quality Calculations and Record of Non-Applicability).

As with Alternative 1, and as shown in Table 3.6-14, emissions in the Hampton Roads AQCR, Virginia, that result from towing the ex-Enterprise from its current location at Newport News Shipbuilding to one of the three commercial locations for partial dismantlement would not result in violations of federal air quality standards because they would be well below the applicable *de minimis* levels. A signed RONA has been prepared and presented in Appendix I (Air Quality Calculations and Record of Non-Applicability) to document this conformity determination.

As with Alternative 1, emissions in the Wallula PM_{10} maintenance area are expected to be minimal due to the short time the tugboats and barge are transiting this region. In this area, emissions associated with the Proposed Action would result from towing the barge with the reactor compartment package to the Port of Benton barge slip. With an anticipated barge transit speed of 8 mph, the barge would pass 12 mi. through this maintenance area in approximately 1.5 hours per vessel per package and contribute an extremely low level of PM_{10} or other criteria pollutants. As shown in Table 3.6-15, air pollutant emissions under Alternative 2 would not result in violations of federal air quality standards because they would be well below the applicable *de minimis* levels. A signed RONA has been prepared and presented in Appendix I (Air Quality Calculations and Record of Non-Applicability) to document this conformity determination.

Table 3.6-14: Estimated Annual Emissions Produced Between 0 and 3 nm of Shore Under Alternative 2 – Hampton Roads AQCR, Virginia, Ozone Maintenance Area

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
0–3 nautical miles (nm)							
Tow of ex-Enterprise to Commercial Dismantlement Facility	N/A	0.49	0.01	N/A	N/A	N/A	N/A
Nonattainment/Maintenance de minimis Levels	N/A	100	100	N/A	N/A	N/A	N/A
Exceeds de minimis Level?	N/A	No	No	N/A	N/A	N/A	N/A

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: (1) CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds.

Individual values may not add up exactly to total values due to rounding.

Table 3.6-15: Estimated Annual Emissions Produced Between 0 and 3 nm of Shore Under Alternative 2 – Wallula, Washington, PM_{10} Maintenance Area

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
0–3 nautical miles (nm)							
River Tugs through Wallula PM_{10} Maintenance Area	N/A	N/A	N/A	N/A	0.02	N/A	N/A
Nonattainment/Maintenance de minimis Levels	N/A	N/A	N/A	N/A	100	N/A	N/A
Exceeds de minimis Level?	N/A	N/A	N/A	N/A	No	N/A	N/A

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds.

Individual values may not add up exactly to total values due to rounding.

3.6.4.3.9.1 National Environmental Policy Act Impacts from Criteria Pollutants Under Alternative 2 for 0–12 Nautical Miles from Shore

Table 3.6-16 presents the total estimated emission results under Alternative 2 within the Study Area and are similar to Alternative 1. When using the PSD major emitting facility numbers as screening thresholds, any relevant increases would be well below the thresholds. In addition, the total quantity of criteria pollutants is very small in relation to the vastness of the Study Area. Therefore, no significant impacts on air quality would occur as a result of criteria pollutants emissions from activities beyond territorial activities.

Table 3.6-16: Estimated Annual Criteria Pollutant Emissions Produced Between 0 and 12 nm from Shore Under Alternative 2

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
Tow of ex-Enterprise to Commercial Dismantlement Facility	0.19	0.80	0.01	0.004	0.03	0.03	4.31E-06
Heavy-Lift ship from Commercial Dismantlement Facility to PSNS & IMF	0.60	6.67	0.25	0.019	0.09	0.08	1.27E-06
Shipment via ocean tug from PSNS & IMF to Vancouver, Washington	4.41	18.36	0.33	0.09	0.66	0.64	9.89E-05
Shipment via river tug to Port of Benton barge slip	2.20	7.49	0.11	0.05	0.33[4]	0.316	4.89E-05
Construction Activities (rail system installation, barge slip modifications, and transport route improvements)	0.35	0.69	0.11	0.00	0.04	0.04	3.66E-07
Land transport from Port of Benton barge slip to Trench 94 at the DOE Hanford Site	0.18	0.80	0.06	0.00	0.02	0.02	8.37E-07
TOTAL	7.94	34.81	0.88	0.17	1.16	1.12	1.55E-04
PSD Major Source Threshold	**250**	**250**	**250**	**250**	**250**	**250**	**250**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds, DOE = Department of Energy, PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility.

Emissions evaluated under General Conformity (those occurring within the Wallula region PM_{10} maintenance area) are included in the total PM_{10} emissions. See Table 3.6-15. Individual values may not add up exactly to total values due to rounding.

3.6.4.3.9.2 Executive Order 12114 Impacts from Criteria Pollutants Under Alternative 2 Greater than 12 Nautical Miles from Shore

Table 3.6-17 presents the total estimated emission results under Alternative 2 beyond 12 nm within the Study Area and is similar to Alternative 1, except for the shipment via ocean tug from PSNS & IMF to Vancouver, Washington. Emissions estimated from that activity are approximately half the emissions estimated under Alternative 1 due to half as many transits. It should be noted that these emissions are estimated to occur beyond 12 nm over the entire transit from around the southern tip of South America, north to the U.S. West Coast, continuing up the coast to northwestern Washington and into the Strait of Juan de Fuca, then south through Puget Sound, ultimately arriving at PSNS & IMF, a distance of over 23,000 miles. The total quantity of criteria pollutants in any one location is very small in relation to the vastness of the Study Area. Therefore, no significant impacts on air quality are anticipated to occur as a result of criteria pollutants emissions from activities beyond territorial activities.

Table 3.6-17: Estimated Annual Criteria Pollutant Emissions Produced Greater than 12 nm from Shore Under Alternative 2

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
Tow of ex-Enterprise to Commercial Dismantlement Facility	7.80	32.43	0.57	0.16	1.16	1.13	1.75E-04
Heavy-Lift ship from Commercial Dismantlement Facility to PSNS & IMF	99.07	1,095.49	41.42	3.17	14.93	13.74	2.09E-04
Shipment via ocean tug from PSNS & IMF to Vancouver, Washington	1.79	7.44	0.13	0.04	0.27	0.26	4.01E-05
TOTAL	**108.66**	**1,135.36**	**42.12**	**3.37**	**16.37**	**15.13**	**4.24E-04**
PSD Major Source Threshold	**250**	**250**	**250**	**250**	**250**	**250**	**250**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).
[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.
[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)
Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds, DOE = Department of Energy, PSD = Prevention of Significant Deterioration, PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility.
Individual values may not add up exactly to total values due to rounding.

3.6.4.3.10 Greenhouse Gases

Estimated greenhouse gas emission increases associated with operations due to implementation of Alternative 2 would be less than 0.001 percent of greenhouse gas inventory of 6,667 million metric tons of CO_2e (Table 3.6-18).

Table 3.6-18: Estimated Annual Greenhouse Gas Emissions Under Alternative 2

Emissions of CO_2e (Metric Tons per Year)	
Alternative 2 Greenhouse Gas Emissions	53,143
National Greenhouse Gas Emissions	6,667,000,000
Percent of National Emissions	0.000797%

Note: CO_2e = carbon dioxide equivalent.

3.6.4.4 Alternative 3 (Preferred Alternative): Commercial Dismantlement

Alternative 3 (Preferred Alternative) would include the towing of ex-Enterprise from its current location at Newport News Shipbuilding in Newport News, Virginia, to one of three commercial dismantlement facilities for dismantlement and disposal. Alternative 3 (Preferred Alternative) does not require federal construction activities, thus construction-related air emissions would not occur under Alternative 3 (Preferred Alternative).

3.6.4.4.1 Complete Dismantlement of ex-Enterprise

Once at the commercial dismantlement location, the selected contractor would dispose of ex-Enterprise by dismantling and recycling it using established processes and techniques. The aircraft carrier dismantling contracts include a clause that requires the contractor to comply with all applicable federal, state, and local environmental, occupational safety and health laws and regulations. The dismantling/recycling would occur at an existing industrial facility that is capable of the operation. It is anticipated that dismantlement emissions would be covered under an existing stationary source permit

issued through New Source Review permitting process and, as such, would be exempted from being considered a direct or indirect emission under General Conformity Applicability Analysis.

Ship recycling activities can generate air pollutants that are regulated by the CAA. If a ship recycling facility emits regulated amounts of air pollutants, it must obtain the appropriate operating or preconstruction permit and comply with all emissions requirements set forth in that permit. Specifically, torch cutting may generate large amounts of fumes and some or all of the following materials as particulates: manganese, nickel, chromium, iron, aluminum, asbestos, and lead. It may also initiate small fires when oil or sludge is ignited by the torch. These fires are usually short-lived but may generate some intense black smoke. The cutting torches themselves can generate oxides of nitrogen and sulfur, and the process of combustion produces carbon dioxide and carbon monoxide. In spite of these releases, air pollutants from metal cutting are not likely to have a major air quality impact (EPA, 2000).

In general, ship recycling activities could result in temporary minor, localized impacts on air quality. However, ship dismantling activities that comply with applicable rules and regulations would not significantly impact air quality.

3.6.4.4.2 Transport Low-Level Radioactive Waste from Commercial Dismantlement Facility to Approved Wasted Facility

Alternative 3 (Preferred Alternative) would involve the dismantlement and recycling of ex-Enterprise at the commercial dismantlement facility and the transport of the LLRW from the commercial dismantlement facility to one of three authorized waste facility locations. There are three commercial dismantlement facility locations in Virginia, Texas, and Alabama and three authorized disposal facility locations in Texas, Utah, and South Carolina (see Section 2.3.4, Alternative 3 [Preferred Alternative] – Commercial Dismantlement). The longest route was chosen to provide the most conservative analysis and air quality estimates. The route via semi-truck from commercial dismantlement facility in Brownsville, Texas to the waste facility in Clive, Utah, is the longest route at approximately 2,461 mi. As a conservative estimate, the total number of transits by semi-truck would be equal to the estimated maximum number of container express boxes for LLRW associated with the reactor plants, or 440 transits. Temporary air quality impacts are expected, but would be spread out over a large geographic area, minimizing impacts on any one area along the transport route (Table 3.6-19).

Table 3.6-19: Estimated Total Criteria Pollutant Emissions Produced Under Alternative 3 (Preferred Alternative)

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
Tow of ex-Enterprise to Commercial Dismantlement Facility	7.99	33.23	0.59	0.17	1.19	1.16	1.79E-04
Transport Low-Level Radioactive Waste from Commercial Dismantlement Facility to Approved Waste Facility	189.82	2.45	1.71	0.014	0.12	0.12	5.14E-06
Total	197.81	35.68	2.30	0.18	1.32	1.28	1.84E-04

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds.

Individual values may not add up exactly to total values due to rounding.

3.6.4.4.3 General Conformity Under Alternative 3 (Preferred Alternative)

It is anticipated that dismantlement emissions would be covered under an existing stationary source permit issued through the New Source Review permitting process and, as such, would be exempt from being considered a direct or indirect emission under General Conformity Applicability Analysis. Transit activities between the commercial dismantlement facilities and the disposal facilities would potentially generate emissions which could impact air quality within numerous air basins, as described in Section 3.6.3 (Affected Environment). Table 3.6-20 presents the estimated nearshore emissions under Alternative 3 (Preferred Alternative). Air pollutant emissions under Alternative 3 (Preferred Alternative) would not result in violations of federal air quality standards because they would not have a measurable impact on air quality in land areas.

Towing the ex-Enterprise from its current location at Newport News Shipbuilding to one of the three commercial locations for dismantlement would result in emissions within the Hampton Roads AQCR, Virginia, which is a maintenance area for the 1997 8-hour ozone NAAQS. As shown in Table 3.6-20, air pollutant emissions due to this activity under Alternative 3 (Preferred Alternative) would not result in violations of federal air quality standards because they would be well below the applicable *de minimis* levels.

Truck waste transport for the Alternative 3 (Preferred Alternative) is a contracted action. Therefore, General Conformity analysis is not applicable for this portion of Alternative 3. Nonattainment areas and maintenance areas on the transport routes between commercial dismantlement facilities and disposal facilities are provided for information only (see Table 3.6-3).

As shown below, emissions are below the applicable *de minimis* levels, including those in nonattainment or maintenance areas. A Conformity Determination is not required, and a RONA has been prepared and presented in Appendix I (Air Quality Calculations and Record of Non-Applicability).

Table 3.6-20: Estimated Annual Emissions Produced Between 0 and 3 nm of Shore Under Alternative 3 (Preferred Alternative) – Hampton Roads AQCR, Virginia, Ozone Maintenance Area

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
0–3 nautical miles (nm)							
Tow of ex-Enterprise to Commercial Dismantlement Facility	N/A	0.49	0.01	N/A	N/A	N/A	N/A
Nonattainment/Maintenance de minimis Levels	N/A	100	100	N/A	N/A	N/A	N/A
Exceeds de minimis Level?	N/A	No	No	N/A	N/A	N/A	N/A

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: CO = carbon monoxide, NOX = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SOX = sulfur oxides, VOC = volatile organic compounds.

Individual values may not add up exactly to total values due to rounding.

3.6.4.4.3.1 National Environmental Policy Act Impacts from Criteria Pollutants Under Alternative 3 (Preferred Alternative) for 0–12 Nautical Miles from Shore

Table 3.6-21 presents the total estimated emission results under Alternative 3 (Preferred Alternative) within 12 nm. Pollutants emitted in the Study Area under Alternative 3 (Preferred Alternative) could be carried ashore by winds. When using the PSD major emitting facility numbers as screening thresholds, any relevant increases would be well below the thresholds. In addition, the total quantity of criteria pollutants is very small in relation to the vastness of the Study Area. Therefore, no significant impacts on air quality would occur as a result of criteria air pollutant emissions from activities beyond territorial activities.

Table 3.6-21: Estimated Annual Criteria Pollutant Emissions Produced Between 0 and 12 nm from Shore Under Alternative 3 (Preferred Alternative)

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
0–3 nautical miles (nm) Emissions	189.94	2.94	1.72	0.017	0.14	0.14	7.77E-06
3–12 nm Emissions	0.08	0.31	0.01	0.00	0.01	0.01	1.69E-06
TOTAL	190.01	3.25	1.73	0.02	0.15	0.15	9.45E-06
PSD Major Source Threshold	**250**	**250**	**250**	**250**	**250**	**250**	**250**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)

Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds, PSD = Prevention of Significant Deterioration.

Individual values may not add up exactly to total values due to rounding.

3.6.4.4.3.2 Executive Order 12114 Impacts from Criteria Pollutants Under Alternative 3 (Preferred Alternative) Greater than 12 Nautical Miles from Shore

Table 3.6-22 presents the total estimated emission results under Alternative 3 (Preferred Alternative) beyond 12 nm within the Study Area. When using the PSD major emitting facility numbers as screening thresholds, any relevant increases would be well below the thresholds. The total quantity of criteria pollutants in any one location is very small in relation to the vastness of the Study Area. Therefore, minimal impacts on air quality as a result of criteria pollutants emissions from activities beyond territorial activities would occur.

Table 3.6-22: Estimated Annual Criteria Pollutant Emissions Produced Greater than 12 nm from Shore Under Alternative 3 (Preferred Alternative)

Criteria Pollutant	Annual Criteria Pollutant[1] Emissions (tons per year)						
	CO	NO_x[2, 3]	VOC[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb
Initial Transport of ex-Enterprise	7.80	32.43	0.57	0.16	1.16	1.13	1.75E-04
TOTAL	7.80	32.43	0.57	0.16	1.16	1.13	1.75E-04
PSD Major Source Threshold	**250**	**250**	**250**	**250**	**250**	**250**	**250**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).
[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.
[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2)
Notes: CO = carbon monoxide, NO_X = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter SO_X = sulfur oxides, VOC = volatile organic compounds, PSD = Prevention of Significant Deterioration.
Individual values may not add up exactly to total values due to rounding.

3.6.4.4.4 Greenhouse Gases

Under Alternative 3 (Preferred Alternative), emissions have been compared with the nationwide greenhouse gas inventory CO_2e emissions for potential significance (Table 3.6-23). Estimated greenhouse gas emissions increases associated with operations due to implementation of Alternative 3 (Preferred Alternative) would be less than 0.0001 percent of greenhouse gas inventory of 6,667 million metric tons of CO_2e.

Table 3.6-23: Estimated Annual Greenhouse Gas Emissions Under Alternative 3 (Preferred Alternative)

Emissions of CO_2e (Metric Tons per Year)	
Alternative 3 Greenhouse Gas Emissions	3,854
National Greenhouse Gas Emissions	6,667,000,000
Percent of National Emissions	0.000058%

Note: CO_2e = carbon dioxide equivalent.

Implementation of all components of Alternative 3 (Preferred Alternative) would not result in significant impacts on air quality.

3.6.5 Comparison of Greenhouse Gas Emissions for Each Alternative

Table 3.6-24 compares the Greenhouse Gas Emissions for each alternative.

Table 3.6-24: Comparison of Greenhouse Gas Emissions Under Each Alternative

Alternative	Emissions of CO_2e (Metric Tons per Year)
No Action Alternative	Negligible
Alternative 1	55,534
Alternative 2	53,143
Alternative 3 (Preferred Alternative)	3,854

3.6.6 Mitigation

All activities would comply with all applicable federal, state, and local environmental, occupational safety and health laws and regulations. If reasonably foreseeable impacts are determined to result, mitigation measures beyond best management practices would be developed and implemented. No mitigation measures are required under any of the alternatives, including the No Action Alternative, because no impacts are reasonably foreseeable.

3.6.7 Summary of Impacts and Conclusions

Table 3.6-25 summarizes the impacts of the alternatives on air quality.

Table 3.6-25: Summary of Impacts and Conclusions on Air Quality

Potential Impacts on Air Quality	Alternatives			
	No Action	1	2	3
Impacts from long-term storage				
Impacts from towing, or transport by vessel		O	O	O
Impact of transport by land		O	O	O
Impacts from Port of Benton barge slip and road improvement work			O	
Impacts of installing rail system for Reactor Compartment Packages in Trench 94 at the DOE Hanford Site		O	O	

Notes: O = Minimal impact, Blank = No impact/Not applicable, DOE = Department of Energy.

3.7 Cultural Resources

This section of the Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) reviews cultural resources to assess the potential impacts of the Proposed Action and alternatives. Cultural resources is a term that encompasses prehistoric and historic archaeological sites; historic buildings, structures, and districts; and physical entities and human-made or natural features important to a culture, a subculture, or a community for traditional, religious, or other reasons. Cultural resources can be divided into three major categories:

- Archaeological resources include prehistoric and historic locations or sites where human activity measurably altered the earth or left deposits of physical remains. Archaeological resources can have a surface component, a subsurface component, or both. Shipwrecks and submerged aircraft wreck sites are also considered archaeological sites.
- Architectural resources are elements of the built environment and include standing buildings, structures, dams, bridges, landscapes, and other built environment resources of historic, engineering, or aesthetic significance.
- Traditional Cultural Properties (TCPs) include properties associated with cultural practices or beliefs of a living community that are rooted in the history of that community and are important in maintaining the continuing cultural identity of the community.

3.7.1 Methodology

3.7.1.1 Region of Influence

The Proposed Action, described in Section 2.1 (Proposed Action), is to dispose of ex-Enterprise, including its defueled reactor plants. It includes three action alternatives and one No Action Alternative. Disposal includes the dismantling and recycling of the non-radioactive remnant hull sections at a government or authorized commercial facility and removing and packaging reactor plant components for transportation and disposal as low-level radioactive waste (LLRW) to an authorized radioactive waste facility or facilities. The areas reviewed for cultural resources include locations in Mobile, Alabama; Brownsville, Texas; Hampton Roads Metropolitan Area, Virginia; and Richland, Washington. These locations contain port and shipyard facilities that may support the storage of ex-Enterprise; the complete dismantlement at commercial ship dismantlement facilities; the Port of Benton barge slip; the transport route through Pacific Northwest National Laboratory (PNNL) site and the Department of Energy (DOE) Hanford Site; and Trench 94, the DOE LLRW burial facility located at the DOE Hanford Site.

There are other components of the Proposed Action and alternatives, including waste transportation routes, ship towing routes, propulsion space section shipping routes via heavy-lift ship, partial dismantlement at commercial ship dismantlement facilities, pier-side work (no in-water work) and dry dock work at Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF), and LLRW storage at commercial disposal sites that are not included in the Region of Influence (ROI) for cultural resources.

3.7.1.2 Regulatory Framework

Cultural resources are governed by federal laws and regulations, including, but not limited to, the National Historic Preservation Act (NHPA) of 1966 as amended, the Archaeological Resources Protection Act (ARPA) of 1979 as amended, the American Indian Religious Freedom Act (AIRFA) of 1978 as amended, the Native American Graves Protection and Repatriation Act of 1990, and Executive Order (EO) 13007, *Indian Sacred Sites*.

3.7.1.2.1 National Historic Preservation Act

The NHPA of 1966, as amended (54 United States Code [U.S.C.] Section 300101 et seq.), and Section 106 implementing regulations (36 Code of Federal Regulations [CFR] Part 800) establish national policy and procedures for addressing effects on historic properties caused by federal actions. NHPA also sets federal policy for historic preservation, which includes identification, evaluation, recordation, documentation, curation, acquisition, protection, management, rehabilitation, restoration, stabilization, maintenance, research, interpretation, and conservation of objects, sites, buildings, structures, and districts that are historically and culturally significant. The act establishes the National Register of Historic Places (NRHP) and National Historic Landmarks Programs, and establishes the Advisory Council on Historic Preservation (ACHP) as an independent federal agency. The 1980 and 1992 amendments to the NHPA direct the Secretary of the Interior to establish guidelines for curation of artifacts, national significant properties, documentation for these properties, and the preservation of federally owned historic sites.

3.7.1.2.1.1 Section 106 of the National Historic Preservation Act

Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties. Historic properties may include prehistoric or historic districts, sites, buildings, structures, or objects that are included in, or eligible for inclusion in, the NRHP. The federal agency, in consultation with the relevant State Historic Preservation Officer (SHPO) and other consulting parties, must consider methods that would avoid, minimize, or mitigate any adverse effects that such undertaking would cause on properties that are listed in the NRHP, or that are determined to be eligible for listing. Section 106 of the NHPA also requires that agencies consult with any Indian tribe or other living community that attaches religious or cultural significance to historic properties that may be affected by the undertaking. Whenever the lead agency determines that the proposed undertaking could adversely affect historic properties, the ACHP shall be given the opportunity to participate in Section 106 consultation.

The Department of Interior, through the National Park Service, established distinct criteria for determining whether a property is eligible for listing in the NRHP. In order to be eligible for the NRHP, a property must meet the criteria for evaluation in at least one area of significance as defined by Secretary of the Interior Standards for Evaluation (36 CFR Part 60):

- associated with events that have made a significant contribution to the broad patterns of American history; or
- associated with the lives of persons significant in our past; or
- embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant or distinguishable entity whose components may lack individual distinction; or
- have yielded, or may likely yield, information important in prehistory or history

Under Section 106 of the NHPA, actions that either directly or indirectly alter any of the characteristics that qualify a property for eligibility for listing in the NRHP "in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association" (36 CFR Part 800.5[a][1]) constitute an adverse effect on the historic property. Federal agencies are required to consider and consult on measures to avoid, minimize, and mitigate adverse effects on historic properties.

3.7.1.2.2 Archaeological Resources Protection Act

ARPA of 1979, as amended (16 U.S.C. Sections 470aa–470mm), provides for the protection of archaeological resources on public lands and Indian lands. ARPA regulates archaeological investigation on public lands and the enforcement of penalties against those who loot or vandalize archaeological resources. The statute requires federal agencies to protect information about the locations and nature of these resources and stipulates that federal agencies notify any Indian tribe which may consider the site as having religious or cultural importance if the issuance of a permit may result in harm to, or destruction of, any Indian tribal religious or cultural site on public lands (32 CFR Part 229.7(a)).

3.7.1.2.3 American Indian Religious Freedom Act

AIRFA of 1978, as amended (42 U.S.C. Section 1996), provides protection of American Indian religious practices. AIRFA establishes the policy of the federal government "to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including, but not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites."

3.7.1.2.4 Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (25 U.S.C. Sections 3001–3013) provides for the disposition and repatriation of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony. Federal agencies are required to consult with Indian tribes whenever planned activities on federal or tribal lands encounter, or are expected to encounter, these cultural items, or when such items are inadvertently discovered on federal or tribal lands.

3.7.1.2.5 Executive Order 13007 – Indian Sacred Sites

EO 13007, *Indian Sacred Sites* (61 Federal Register 26771-26772 [1996]), addresses the accommodation of sacred sites in order to protect and preserve Indian religious practice. EO 13007 directs federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sites. This EO also directs federal agencies, where appropriate, to maintain the confidentiality of sacred sites.

3.7.1.3 Best Management Practices

Cultural Resource Management Plans are developed by federal agencies to establish guidance for the identification, evaluation, recordation, curation, and management of archaeological sites, built environment resources, and TCPs as individual entities or as contributing properties within an archaeological or historic district. The plans specify methods of consultation with affected tribes and Tribal Historic Preservation Officers, government agencies, and interested parties, and include strategies for the management, preservation and/or curation of representative properties, heritage assets, archives, and objects. These plans are routinely updated to ensure they comply with federal laws and regulations, EOs, Department of Defense policy, and U.S. Department of the Navy (Navy) policy.

Management of cultural resources within the DOE Hanford Site follows the *Hanford Cultural Resources Management Plan*, maintained by the DOE Richland Operations Office (DOE/RL-98-10; (DOE, 2003)). Management of cultural and biological resources within the PNNL site follow the *Pacific Northwest Site Office (PNSO) Cultural and Biological Resources Management Plan*, maintained by the DOE PNSO (DOE/PNSO-PLAN-09; (DOE, 2021)).

3.7.1.4 Approach to Analysis

Cultural resources were reviewed for the components of the Proposed Action and alternatives that contain port and shipyard facilities that may support the storage of ex-Enterprise in Newport News Shipbuilding, in Newport News, Virginia; the complete dismantlement at commercial ship dismantlement facilities in Mobile, Alabama; Brownsville, Texas; or Hampton Roads Metropolitan Area, Virginia; and the Port of Benton barge slip, the transport route through PNNL site and the DOE Hanford Site, and Trench 94 at the DOE Hanford Site in Richland, Washington. Cultural resource identification efforts for these study areas were conducted through archival research of existing databases and previous cultural resources investigations, and an assessment of the cultural setting for these four locations.

3.7.1.5 National Historic Preservation Act Section 106 Consultation

As described in Section 3.7.1.2.1 (National Historic Preservation Act), the regulations implementing Section 106 of the NHPA specify a consultation process to assist in the identification of historic properties that may be affected by a federal action and require federal agencies to consider the effects of their actions on identified historic properties.

Disposition of ex-Enterprise as an historic vessel is covered by a Program Comment, a Section 106 program alternative for compliance with the NHPA, the procedures of which are described in Section 3.7.2.1 (Ex-Enterprise [CVN 65]).

Section 106 review of the Proposed Action and alternatives, as documented in this EIS/OEIS, confirms that Alternative 3 (Preferred Alternative) does not involve activities of the type that have the potential to cause effects on historic properties. If the preferred alternative is chosen, there are no further obligations under Section 106 or 36 CFR Part 800. If another action alternative is chosen, additional Section 106 of the NHPA reviews will be necessary.

3.7.2 Affected Environment

3.7.2.1 Ex-Enterprise (CVN 65)

The first nuclear-powered aircraft carrier in the world, USS Enterprise, was commissioned in November 1961 and completed 25 deployments during 51 years of service. The ship is more than 1,000 feet (ft.) in length, close to 250 ft. wide, and could reach speeds of more than 30 knots (Naval History and Heritage Command, 2015, 2019). The Navy inactivated USS Enterprise on December 1, 2012, and stored it at Newport News Shipbuilding; in 2014, one of the anchors was transferred to USS ABRAHAM LINCOLN (Lendon, 2014). USS Enterprise was decommissioned and struck from the Naval Vessel Register on February 3, 2017.

The Navy, in considering listing a historic vessel, prepares a Determination of Eligibility or Determination of Ineligibility document for listing in the NRHP, and consults with the appropriate SHPO. Navy vessels that meet one or more of the criteria for evaluation in at least one area of significance as defined by Secretary of the Interior Standards for Evaluation (36 CFR Part 60), and that continue to possess integrity of (as appropriate) design, materials, workmanship, feeling and/or association, are eligible for listing in the NRHP.

Ex-Enterprise meets the criteria to be eligible for listing in the NRHP according to a Naval Ship Historical Evaluation (Final Determination initiated May 1, 2012, finalized July 11, 2012) prepared by the Naval History and Heritage Command ships history division. Support for its eligibility included the following elements: that ex-Enterprise was the first nuclear-powered aircraft carrier in the world, its impressive

50-year combat history, and the acts of heroism taken by several pilots and aircrew who were stationed on the ship.

On March 5, 2010, the ACHP issued a final Program Comment for the Department of the Navy for the Disposition of Historic Vessels (75 Federal Register 12246). The Program Comment sets forth requirements for the Navy to satisfy its Section 106 obligations through a streamlined process to determine the NRHP eligibility of vessels and to resolve adverse effects that may result from their disposition. The Program Comment requires the following steps for vessels found eligible for listing in the NRHP upon decommissioning:

- Annotate the vessel's entry in the Naval Vessel Register to reflect listing eligibility and include the basis for eligibility (the public can access the Naval Vessel Register at http://www.nvr.navy.mil); and
- Make available a documentation package consisting of historically significant records such as command operation reports, war diaries, and deck logs, as they are submitted (the public will be able to access the documentation package at the Naval History and Heritage Command; unclassified command operation reports will be available at http://www.history.navy.mil).

For decommissioned vessels determined to be eligible for listing in the NRHP whose method of final disposition is other than donation, the following steps are taken:

- Give priority to compiling histories of these eligible vessels when preparing entries in the Dictionary of American Naval Fighting Ships;
- Retain and, depending on classification, provide public access to historical documentation from NRHP-eligible vessels such as command operation reports, war diaries, and ship deck logs at the Naval History and Heritage Command (deck logs that are more than 30 years old are transferred to the National Archives and Records Administration [NARA] for permanent retention);
- In addition to the standard curatorial items removed from the vessel upon decommissioning in accordance with required Navy policy, including citations, correspondence of significant historical value, ship histories, paintings, ship silver services, and photographs selected to best display the physical characteristics of the vessel, the Navy would make the vessel available to the Navy Curator and eligible nonprofit organizations for removal of additional equipment, parts of the vessel, etc., that contribute to the historical significance of the vessel. Items removed by the Navy Curator will be maintained and considered for loan to qualified U.S. non-profit organizations in accordance with 10 U.S.C. 2572, 4575; and
- Within three years of designating a NRHP-eligible vessel for final disposition, deposit with the NARA documentation consisting of archivally stable media of the following items:
  - A Booklet of General Plans; and
  - The last report of the Board of Inspection and Survey describing the material condition of the vessel.

Note that accessibility to the public will depend on the document's classification and NARA's policies (see 75 Federal Register 12248).

Actions taken specific to ex-Enterprise include:

- CVN 65's Determination of Eligibility was provided to the National Conference of State Historic Preservation Officers, Historic Naval Ships Association, and the USS Enterprise Association by

Naval Sea Systems Command Project Manager, Ships 333 letter SER 333/072 of May 16, 2012. The Determination of Eligibility was posted for a 60-day public comment period that expired on July 11, 2012. No comments were received by any stakeholder or member of the public. That document can now be found here: https://www.navsea.navy.mil/Portals/103/Documents/TeamShips/SEA21/InactiveShips/Historic/2012/ENTERPRISE_CVN65_FINAL_DOE11Jul2012.pdf

- Historically significant records, publicly available, can be found at the Naval History and Heritage Command website here: https://www.history.navy.mil/browse-by-topic/ships/aircraft-carriers/enterprise.html
- A history of the vessel can be found in the Dictionary of American Naval Fighting Ships here: https://www.history.navy.mil/research/histories/ship-histories/danfs/e/enterprise-cvan-65-viii-2001-2017.html
- Items were removed from the ship and procured by the Navy Curator. These items are maintained by the Naval Heritage and History Command Curator Branch and are considered for loan to qualified U.S. non-profit organizations in accordance with 10 U.S.C. 2572, 4575. For more detailed information, please contact the Curator Branch at (202) 433-2220 or email nhhc_curator@us.navy.mil.

Under the Program Comment, the Navy is required to "within three years of designating a NRHP-eligible vessel for final disposition, deposit with NARA…a. A Booklet of General Plans; and b. The last report of the Board of Inspection and Survey describing the material condition of the vessel." The vessel will be designated for final disposition after completion of the EIS/OEIS Record of Decision and when the Navy awards a contract for disposition of the ship. That contract is currently expected to be awarded in 2025.

Upon designating final disposition, the Navy will deposit the required materials with NARA, fulfilling the remaining requirements of the Program Comment, and thereby satisfying Navy's responsibilities under Section 106 of the NHPA to take into account the effect of the Proposed Action on the NRHP-eligible ex-Enterprise.

3.7.2.2 Washington

The study area considered for cultural resources review within Washington includes the Port of Benton barge slip; a 164 ft. (50-meter) buffer along the approximately 25-mile (mi.) transport route through the PNNL site (managed by the PNSO within DOE Office of Science) and the DOE Hanford Site (managed by the DOE Richland Operations Office); and Trench 94, the DOE LLRW burial facility located at the DOE Hanford Site (Figure 3.7-1).



Figure 3.7-1: Washington Cultural Resources Study Area

3.7.2.2.1 Cultural Setting

Native Americans have occupied the lands in and around the study area for thousands of years (Relander, 1956; Walker JR., 1998). Archaeological sites identified on the DOE Hanford Site date back at least 8,000 years and are usually found along the banks of the Columbia River. Inland locations that are well-watered also show evidence of concentrated human activity, with seasonal use of arid lowlands for hunting and other resource procurement activities (Chatters, 1982; Greene, 1975; Leonhardy & Rice, 1970; Rice, 1980; DOE, 2003; Woody, 2003).

Members of the Lewis and Clark expedition were the first Euro-Americans to pass near the study area, between 1804 and 1806 during their exploration of the Columbia and Snake River Valleys. The expedition and other Euro-American explorers travelling down the Columbia River seeking fur and gold likely encountered the Wanapum Indians, who inhabited villages and fishing camps along the mid-Columbia River Basin. Neighboring groups, such as the Yakama, Umatilla, Cayuse, Walla Walla, Palus, Nez Perce, and the Middle Columbia Salish, also frequented the area to trade, gather resources, and conduct other activities. The descendants of these early inhabitants include members of three federally recognized tribes: the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and the Nez Perce Tribe, as well as one non-federally recognized tribe, the Wanapum of Priest Rapids (Wanapum).

Cattle ranchers moved into the Richland area in the 1880s, and homesteaders began appearing on the banks of the Columbia River in the 1890s (DOE, 2003). The construction of large-scale hydroelectric dams and irrigation systems in the early 20th century brought many additional farmers to the inland portions of the area. Electric power was brought to the region by 1908, when a 100 mi. electric transmission line was constructed from Wenatchee to Kennewick. This power came from the Hanford Irrigation and Power Company plant at Coyote Rapids, upriver from the study area. Water for the irrigation system was also pumped at the Coyote Rapids plant. In 1913, a branch line of the Chicago, Milwaukee, St. Paul, and Pacific Railroad was completed across the DOE Hanford Site (DOE, 2003).

During World War II, the federal government identified Hanford as an ideal place for plutonium production for the manufacturing of nuclear bombs—remote, away from densely populated areas, and with access to abundant water and electricity. In 1943, under the authority of the War Powers Act, the federal government acquired 625 square miles of land for the Manhattan Project (Harvey, 2000; Parker, 1986). The DOE Hanford Site was divided into areas that specialized in plutonium production processes. Uranium fuel elements were fabricated and jacketed in the 300 Area. In the 100 Areas, reactors radiated the uranium fuel elements to produce plutonium. Uranium was chemically dissolved and separated into plutonium and other products in the 200 Areas. The 600 Area provided support facilities for the entire area (Harvey, 2000). Richland Village, later known as the town of Richland, was established for the Hanford Engineering Works employees and families.

During the initial years of the Cold War the government sought to further develop its nuclear weapons program. Five new reactors were added during this time, and various buildings were constructed, including those that housed research and development laboratories, maintenance and craft shops, administrative facilities, waste management, and environmental science research laboratories. The Hanford Construction Camp was established east of the 200 East Area to house construction workers.

However, decreased demand for radioactive materials resulted in the downsizing of the plutonium mission by the mid-1960s. At the end of the Cold War, in 1987, the last of Hanford's nine reactors was shut down (Harvey, 2000).

After the Cold War, the DOE Hanford Site shifted to a mission of environmental restoration and remediation. This has resulted in the decommissioning, decontamination, and demolition of many of the facilities built for the Manhattan Project and Cold War. Some buildings, however, have been repurposed for scientific use and reclamation activities. In 1996, DOE established a Historic Buildings Task Group to identify and evaluate buildings and structures for the Hanford Site Manhattan Project and Cold War Era Historic District (DOE, 1997a). Recently, DOE has also entered into an agreement with the National Park Service to include portions of the DOE Hanford Site in the Manhattan Project National Historical Park. At the same time, a treatment plan was developed for the management of the historic district cultural resources.

3.7.2.2.2 Cultural Resources Within the Study Area

The review of the Washington SHPO and Navy cultural resources records indicate that several cultural resources are located within the study area. The transport route intersects the Hanford Site Plant Railroad (45BN1107) in three places, the Hanford Irrigation Ditch (45BN309) in three places, and the Richland Irrigation Ditch Lateral 4 (45BN1125) in one place; all three resources are eligible for listing in the NRHP. In addition, 19 archaeological sites or isolates are located within the study area along the haul road. Most remain unevaluated or are not eligible for listing on the NRHP, with the exception of the Tsulim Site (45BN412), a NRHP-eligible pre-contact butchering site containing mammal bone fragments, fire-cracked rock, and stone tools, dating between 1600 and 2000 years before present. The haul road also passes near 45BN1142 (a potentially NRHP-eligible site consisting of a historic debris scatter with artifacts dating to early 1940s), and through the Hanford Construction Camp (45BN0308) and the edge of the Gable Mountain Archaeological District (45DT-102; potentially NRHP-eligible). The Hanford Construction Camp is a NRHP-eligible Historic District; the Hanford Irrigation Ditch (45BN309) is a contributing component of the district.

The study area is also situated almost entirely within the Hanford Site Manhattan Project and Cold War Era Historic District. While none of the NRHP-eligible contributing buildings are located within the study area, the Hanford Site Plant Railroad, discussed above, is documented as a contributing property to the Hanford Site Manhattan Project and Cold War Era Historic District (DOE, 1997b).

Local tribes have identified several places of cultural significance on the DOE Hanford Site and PNNL site landscapes, and recent tribal TCP studies and consultation undertaken between DOE (Richland Operations Office and PNSO) and the Yakama Nation, the CTUIR, the Nez Perce Tribe, and the Wanapum have identified several TCPs that are likely to be within the study area, as documented in recent Environmental Assessments (EAs). TCPs documented as eligible for listing in the NRHP in *the Proposed Conveyance of Land at the DOE Hanford Site EA* include the Yakama Nation TCP, the First Foods Gathering Areas TCP, Óykala ayn wéetes TCP, and the Shu Wipa TCP (DOE, 2015). In addition, the transport route intersects an ethnographic trail considered to be a contributing element of the NRHP-eligible Wooded Island Archaeological District (45DT-31), as identified in the *Proposed Conveyance of Land at the DOE Hanford Site* (DOE, 2015). The Shu Wipa TCP was also documented in the *Pacific Northwest National Laboratory Richland Campus Future Development EA* (hereafter referred to as the 2017 EA) (DOE, 2017). As noted in the 2017 EA, “Shu Wipa is of cultural and historic importance to the Wanapum for traditional fishing, gathering, and ceremonial purposes” (DOE, 2017). Further, the CTUIR identified the Šúuwipa TCP in the 2017 EA; this area was used for materials and medicine gathering and as a traditional fishing area. The Yakama Nation, who indicated that they hold cultural significance to the area and the cultural material within it, also identified a TCP (DOE, 2017).

The study area also passes through the Preservation Designated Area (PDA), an area set aside by DOE for the preservation of sensitive cultural resources and managed for protection of cultural and biological resources (DOE, 2015, 2017). The PDA is considered an area of cultural significance to area tribes and has been identified as a sacred site under EO 13007 by the CTUIR and the Nez Perce Tribe.

The Port of Benton barge slip is situated within the boundary of the Hanford South Archaeological District (45DT-39). The district is composed of 50 prehistoric archaeological sites that are distributed along 11 mi. of the Columbia River; none of the recorded resources are located in the Port of Benton barge slip area. The Port of Benton barge slip area was surveyed by the U.S. Army Corps of Engineers (USACE) for cultural resources in 2016 for future barge slip infrastructure modifications (USACE, 2016). The 2016 survey resulted in negative findings for cultural material, with the exception of modern materials above and below the cut-bank. Subsurface testing conducted in the barge slip area in 2005 and 2013 has shown there are no subsurface cultural resources present at the barge slip (USACE, 2016). The built environment resources associated with the barge slip are of relatively modern origin; the Port of Benton was established in 1958 to help economic and industrial development for North Richland and Prosser. In 1965 the Port began construction of a dock, and in 1972 construction of the current slip was initiated (USACE, 2016). There are no known NRHP-eligible built environment properties associated with the barge slip.

3.7.2.3 Virginia

The study area considered for cultural resources review within Virginia consists of an approximately 933-acre area on the southwest side of Newport News near the confluence of the James River and the Chesapeake Bay, within the Hampton Roads Metropolitan Area, Virginia (Figure 3.7-2).

3.7.2.3.1 Cultural Setting

Recent research suggests that Virginia has been occupied by Native Americans for at least 17,000 years—the Cactus Hill site in the southern portion of the state produced a 17,000-year-old radiocarbon date and is considered to be a stone tool manufacturing site (Egloff & Woodward, 2006). These indigenous people likely lived in small groups and camped along the streams that flowed through the grasslands and pine and fir forests of the time. At the end of the Paleoindian Period, around 10,000 years ago, the inhabitants of the area were forced to adapt to a new warmer and drier climate as large game either went extinct or moved north. During the following Archaic Period (5,000–10,000 years ago), small, semi-sedentary villages were built along the rich floodplains of southern Virginia. Around this time, craft specialization and class ranking began to appear (Egloff & Woodward, 2006; Funk, 1978).

The subsequent Woodland Period (3,200 to 400 years ago) is marked by the appearance of clay pottery in the archaeological record. Gradually over the last 3,000 years, complex social, economic, and political structures evolved. Permanent villages were built along riverbanks and supported by short-term hunting and gathering trips; a wide range of pottery forms, stone and bone tools, and beads and pendants were produced; and an elaborate burial ritual evolved where the deceased were buried in ossuaries after flesh decomposition (Egloff & Woodward, 2006; Tuck, 1978).

By the time British colonists arrived in what would become Jamestown in 1607, the Powhatan Paramount Chief of the Pamunkey Tribe ruled more than 32 sub-chiefdoms in more than 150 villages in the region (Feest, 1978).



Figure 3.7-2: Virginia Cultural Resources Study Area

In the late 16th century, the first explorers in the region encountered two tribes that inhabited territories in the area: the Chesapeake Tribe occupied the Elizabeth River and Virginia Beach areas, and the Kecoughtan Tribe occupied the south end of the James-York Peninsula. Both tribes disappeared early from the historic record (Feest, 1978). Skicóak, the main village of the Chesapeake, was located near the town of Norfolk. Historical accounts suggest that the Chesapeake, who were described as a small group of 335 people, may have been decimated by the early 17th century—the last mention of the Chesapeake occurred in 1627 (Feest, 1978; Mook, 1944). Kecoughtan, the main village of the Kecoughtan Tribe, was situated 6 mi. east of what is now downtown Newport News. By the time the first English settlers had arrived in 1607, Powhatan had taken over the village and repopulated it with a small community of loyal subjects. The Kecoughtan Tribe is no longer mentioned in the historic literature after 1610, likely due to Powhatan's supplanting of the village (Feest, 1978).

No current federally or non-federally recognized tribes claim Chesapeake or Kecoughtan ancestry, though the federally recognized Pamunkey Indian Tribe of Virginia is descended from those Native Americans who once formed the Powhatan Confederacy. The federally recognized Nansemond Indian Nation continue to inhabit the Nansemond River drainage directly west of the Elizabeth River (Feest, 1978).

The point at Newport News was initially named Point Hope by Captain John Smith when the Jamestown colonists first sailed up the James River in 1607. The earliest reference to the area as Newport News is located in a letter written from Jamestown in November 1619, when those living in Kecoughtan had the opportunity to "choose their divident along the banke of the great river betweene Kequohtan and Newportes Newes" (Hatch, 2009). Two years later, Englishman Daniel Gookin was given a land grant of roughly 1,300 acres west of Newport News to develop a plantation. By 1633, Newport News had become an established watering point for ingoing and outgoing vessels to Jamestown; however, the area remained predominantly rural through the 19th century (Hatch, 2009; Reid & McCartney, 1990).

In 1880, Newport News was selected as the Atlantic terminus of the growing U.S. railroad system by Collis P. Huntington (Hiden, 1947). Huntington selected Newport News because of its protected deep water port—he envisioned a terminal for coal export in exchange for foreign commodities (Hiden, 1947; Odom, 1967). The Chesapeake Dry Dock and Construction Company was established in 1886 by Huntington's company for the purpose of repairing and maintaining ships involved in the coal trade, and the first shipyard officially opened in 1889, with the first dry dock, Dry Dock #1, constructed at this time. The city of Newport News was incorporated in 1896; by 1900, it boasted one passenger pier, two pleasure piers, four covered piers, eight open freight piers, and three coaling piers (Reid & McCartney, 1990).

In 1890, manufacture of ships was added to the mission of Chesapeake Dry Dock, and the shipyard was renamed Newport News Shipyard and Dry Dock Company. The first Navy ship built in the shipyard was the gunboat USS *Nashville* (PG-7) in 1897, and the shipyard has built over 800 ships since, for both Navy and non-military customers (Newswanger, 2011).

Newport News Shipyard continued to expand. In the early 1900s, a housing development was constructed northeast of the shipyard (The North End Historic District) to accommodate workers (Reid & McCartney, 1990). In addition, new structures were built during this period, including Dry Dock #2; a boiler; and pattern, machine, pipefitting, and paint shops. During World War I, the federal government used Newport News as an embarkation station for troops and supplies. The shipyard also ramped up work to supply the Navy with ships, and Dry Dock #3 was built during this time. Several additional

residential developments were built nearby to house the influx of workers, including the Hilton Village, a residential development north of the city, and the Riverside Apartments on Washington Avenue (Reid & McCartney, 1990). After World War I, the shipyard diversified into the manufacture of locomotives, heavy machinery, water turbines, and other equipment. During World War II, Newport News served again as an embarkation station, and the shipyard employed over 31,000 workers, built 49 ships for the Navy, and retrofit 1,500 naval vessels (Reid & McCartney, 1990). When Tenneco, Inc. purchased Newport News Shipyard in 1968, a new North Yard was constructed on 150 acres of landfill. The yard features a 900-ton gantry crane, a 1,600-foot dry dock, and an 11-acre production facility (Maritime Reporter, 1986). Today, the shipyard is known as Newport News Shipbuilding and occupies 500 acres along the James River (Maritime Reporter, 1986).

3.7.2.3.2 Cultural Resources Within the Study Area

A review of the online Virginia Cultural Resources Information System managed by the Virginia State Department of Historic Resources was conducted for the study area within Virginia, with additional data provided by Naval Facilities Engineering Command, Mid-Atlantic cultural resources staff.

The review indicates that two cultural resources are known to exist within the study area: Newport News Shipyard and Dry Dock Company (121-0051) and the Shipyard Office Building (121-0233). These two properties were recorded in a 1990 architectural survey of historic downtown Newport News. At the time, Newport News Shipbuilding did not give access to the team nor provide information on any specific properties within the historic site (Reid & McCartney, 1990). Recognizing that the shipyard contains some of the oldest buildings and structures in the city, a draft NRHP nomination for a grouping of the oldest buildings between 39th and 42nd Streets was prepared, but the process was never completed (Reid & McCartney, 1990). This grouping contains Dry Dock #1 (constructed in 1889), the Engineering and Administration Building, machine and joiner shops, pattern shop, foundry, and other buildings. Dry Dock #2, built in the late 1890s, is also one of the oldest historic structures in the shipyard. The Newport News Shipyard and Dry Dock Company site is currently unevaluated for listing on the NRHP.

Newport News Shipbuilding acquired property between 33rd and 36th Streets west of Washington Avenue sometime after World War I. At the time, these streets contained residential and commercial buildings, several of which are listed in the Virginia Cultural Resources Information System However, within this portion of the study area, the Shipyard Office Building (121-0233) at 3301 West Avenue still stands, but it is currently unevaluated for listing on the NRHP.

No archaeological sites or sunken cultural resources are known to exist within the study area, and it is unlikely that intact archaeological sites would be found, as historic maps and records show that the 1969 addition of the northern yard was built almost entirely on fill, and much of the waterfront area on the south end was also built on fill (Coch, 1971). No TCPs are known to exist within the study area, nor have any historic districts been formally documented within the study area.

3.7.2.4 Texas

The study area considered for cultural resources review within Texas includes the Brownsville Ship Channel and dismantling facilities located within the Port of Brownsville, which is in a manmade inlet southwest of South Padre Island. The study area covers an area of approximately 661 acres, within which multiple facilities capable of ship dismantlement work are situated (Figure 3.7-3).



Figure 3.7-3: Texas Cultural Resources Study Area

3.7.2.4.1 Cultural Setting

Southern Texas is one of the least archaeologically known areas in the state (Black, 1989; Campbell, 1983; Hester, 1989). This is likely due to the limited archaeological research conducted in the Brownsville area; jurisdictional issues associated with the international border; and the early displacement, assimilation, and death by contagious diseases of indigenous peoples who had a history and cultural knowledge of the area (Hester, 1989). The oldest evidence of human habitation in the Rio Grande delta dates back to approximately 3,000 years ago, when the delta stabilized (Hester, 1989). The earliest sites are shell middens located on lomas adjacent to inland waterways and suggest an adaptation to the coastal estuary environment (Black, 1989).

The distinct "Brownsville Complex" appeared approximately 800 years ago and consisted of a sophisticated shell-working industry. The Complex is linked to numerous cemeteries in the region; these cemeteries are typically located in clay dunes or along the Rio Grande, usually located within higher areas due to the threat of flooding (Perttula et al., 2010). Open sites are often located near resacas (i.e., meandering channels of the Rio Grande delta), in aeolian depressions, and along the Rio Grande Channel—the variety of site types and distribution across the landscape suggest a high mobility. The subsistence patterns typically focused on marine species of shellfish and fish (Black, 1989).

The Brownsville Complex continued into the historic era and may be represented by the Coahuiltecans, who occupied the Gulf Coast from the Edwards Plateau in southern Texas south into Mexico. Coahuiltecan is at first a language group, centered around Coahuila in Northern Mexico; however, the term has also been applied to people who lived in the lower Rio Grande area. What is known about these people comes from historic records—early accounts suggest that at least 34 groups inhabited the Rio Grande delta and the surrounding area. Some of the groups ranged south of the Rio Grande Channel and are known to have spoken Cotoname, a Coahuiltecan dialect (Campbell, 1983; Salinas, 1990). Recent research, however, suggests that not all Coahuiltecans were Coahuiltecan-speakers; the richness and diversity of resources in the Rio Grande delta likely drew people from other regions as well (Salinas, 1990).

Most of the groups living in the delta shared a similar adaptation. They were highly mobile hunter gatherers who lived in autonomous groups (Hester, 1989). These groups as ethnically distinct entities slowly disappear from the historic record and are no longer mentioned after 1900. Their disappearance is likely attributed to warfare, epidemics, and gradual assimilation into Spanish society (Salinas, 1990). Recently, however, descendants of the Carrizo and Comecrudo, two groups that once inhabited the Rio Grande delta, have joined together to form the non-federally recognized Carrizo/Comecrudo Tribe of Texas (Carrizo/Comecrudo Tribe, n.d.).

The Lipan Apache, who were related to the Kiowa and Mescalero Apache, arrived in Texas from eastern New Mexico sometime between 1750 and 1850 after being pushed south by the Comanche (Hester, 1989). Continued war with the Comanche and the onslaught of American settlers caused the Lipan to splinter into different bands scattered across southern Texas and northern Mexico at the periphery of the Comanche range. When Texas was annexed by the United States in 1845, the government began establishing reservations for the Apache and Comanche, first on the Brazos River. In 1867, the Treaty of Medicine Lodge Creek established a reservation for most remaining Comanches, Kiowas, and Kiowa Apache in southwestern Oklahoma (Lipscomb, 2019). This group is the federally recognized Comanche Nation. In 1903, some members of the Lipan Apache Big Water band were forced onto the Mescalero Apache Reservation in New Mexico, a federally recognized tribe today. About the same time, the Lipan Apache Sun Otter band established an enclave in San Antonio on the site of an ancestral camp. This

group, along with surviving members of the Little Breech Cloth and Tall Grass bands, have merged to form the Lipan Apache Tribe of Texas. This tribe is recognized by the state of Texas and is seeking federal recognition (Lipan Apache Tribe of Texas, n.d.).

Alvarez de Peneda, a Spanish Conquistador and cartographer, was the first European to visit Padre and Brazos Islands, located at the east end of the Brownsville Ship Channel. A few years later, Spanish Captain Francisco Garay named the sandbar that separated the islands Brazos Santiago Pass. In 1770, a small settlement was established at Point Isabel, which is located on the mainland side of the inland waterway. Shortly after this, a port was established on the north end of Brazos Island. Both ports were active early on, though the shallow Pass often caused difficulties for ship passage (Fox, 1989; Hoyt et al., 1991).

In 1845, the Republic of Texas was annexed into the United States precipitating the Mexican-American War. The following year, U.S. General Zachary Taylor established Fort Brown on the north side of the Rio Grande River in anticipation of forthcoming war. After the United States won the Mexican-American War and the border stabilized, Charles Stillman, a wealthy New York merchant, bought nearly 4,700 acres surrounding Fort Brown and established the town of Brownsville, anticipating the growth of a new metropolis to serve American interests (Kearney & Knopp, 1991). Americans began moving to the Brownsville area to grow cotton and citrus, and to establish new businesses (Hoyt et al., 1991; Rhodes, 2019). The economy of the area, and thus the prosperity of the businesses, was highly dependent on the ability to ship goods in and out of the area. Brownsville prospered early on when Port Isabel was an active port and goods were transported by steamboat up the Rio Grande River. However, the Brownsville economy slowly declined when the newly constructed Mexican National Railroad bypassed the area. In 1904, the St. Louis, Brownsville, and Mexican Railroad between Brownsville and the deep-water port of Aransas, 200 mi. north, was constructed, causing the economy to improve again. The high cost of transport from Aransas motivated Brownsville businessmen to seek a way to construct a local deep-water port (Hoyt et al., 1991).

The USACE had developed plans for a deep-water harbor at Brazos Santiago as early as 1854. The Rivers and Harbors Act of 1881 outlined a plan to construct parallel jetties to protect the pass and establish a deep-water harbor at Port Isabel. The southern jetty completed in 1883 was washed out shortly thereafter. This essentially put the project on hold for 20 years, until it was discovered in 1904 that funds remained from the project. The USACE used these funds to dredge a channel from Brazos Santiago Pass across Laguna Madres to Point Isabel. This channel was built to accommodate light steamers crossing the bar at Brazos Santiago; unfortunately, the new harbor was rendered useless when the steamer Luzon sank (Hoyt et al., 1991).

In the second decade of the 20th century, the efforts of the Brownsville Waterways Association pushed Congress to approve a project to dredge a channel through the pass. Dredging began inside and outside the harbor, and two jetties were constructed in 1927 (Hoyt et al., 1991). The Rivers and Harbors Act of 1930 authorized construction of the current 19 mi. long Brownsville Ship Channel, which extends from Brazos Santiago Pass on the east to within 5 mi. of Brownsville on the west. This new channel cut through a mix of terrestrial and lake habitats, and was dredged to a depth of 25 ft. and a width of 100 ft. at the bottom and 250 ft. at the surface. Much of the dredged material was deposited along the northern bank of the channel. Shortly after completion of the channel, two docks and two warehouses were constructed at the new Brownsville port (Hoyt et al., 1991).

The Port of Brownsville opened on May 16, 1936, and improvements to the channel have occurred over the years until its depth reached 36 ft. The Water Resources Bill of 1986 authorized further dredging to a depth of 42 ft., and the USACE is currently working to further deepen the channel to 52 ft. (Hoyt et al., 1991; USACE, 2014; Valley Business Report, 2019).

The Brownsville study area experienced no development until five ship salvage companies were established between 1971 and 1976. Over the years, these salvage yards have changed hands and undergone various improvements including the installation of slips, filling and levelling, construction of bulkheads, moorings, and installation of underground utilities. Today, three salvage companies are present within the study area, flanking the north and south sides of the Brownsville Channel: SteelCoast Company, LLC, and All Star Metals, LLC on the north side of the channel; and EMR International Shipbreaking Limited, LLC on the southwest side of the channel.

3.7.2.4.2 Cultural Resources Within the Study Area

A review of the Texas Historical Commission Online Atlas of Cultural Resources was conducted for this review, which indicated that no cultural resources have been documented in the study area. Most archaeological sites in the delta are located on lomas, or the natural levees that flank resacas. An s-shaped resaca crosses through the center of the study area, flanked by the Loma de la Madriguera; as such, there is the potential for buried archaeological sites to occur underneath fill and spoil materials. No TCPs, sunken cultural resources, or shipwrecks are known to exist within the study area.

Additional information was provided by the Texas Historical Commission for Final EIS/OEIS (Appendix C [Public Comments and Responses]). The Port of Brownsville, also known as the Brownsville Ship Channel, was recommended eligible for listing in the NRHP in 2013. The historic district includes the ship channel and its associated buildings, roads, and railroads. Constructed to connect Brownsville to the Gulf of Mexico, the Port of Brownsville is significant at the local and state level under Criterion A in the area of Commerce for its role in developing and expanding the economy of the Lower Rio Grande Valley with a period of significance that extends from the time of its construction in 1936 to the 1980s.

3.7.2.5 Alabama

The study area considered for cultural resources review within Alabama is located where the Mobile River empties into Mobile Bay and the Gulf of Mexico and consists of a 437-acre area that encompasses public, deep-water terminals and commercial facilities capable of ship dismantlement work (Figure 3.7-4).



Figure 3.7-4: Alabama Cultural Resources Study Area

3.7.2.5.1 Cultural Setting

The earliest human occupation of Alabama occurred approximately 15,000 years ago; however, the earliest evidence of humans in the Mobile Bay area occurs around 7,000 to 8,000 years ago (Brose et al., 1983; Halligan et al., 2016; Mistovich & Knight, 1983; Wilson, 1983). Earlier sites may be buried or destroyed as a result of sea level rise (Wilson, 1983). Around 10,500 years ago with warming climates, the ice age megafauna disappeared, and people adopted a more generalized hunter-forager subsistence strategy (Hoksbergen, 2011). During the Archaic period (approximately 10,500 to about 3,000 years ago) people retained a nomadic lifestyle, but technology and procurement strategies became more sophisticated, and long-distance exchange networks were established. When sea levels began to stabilize near the end of the Archaic period, indigenous Americans established base camps in the upper and lower parts of Mobile Bay to harvest oysters (Meredith, 2015).

The following Woodland Period (3,000 to 1,000 years ago) is characterized by increasing population growth and complexity. Horticulture was widely adopted, as was the manufacture of pottery and the use of bow and arrow technology. Complex death and burial ceremonies were also adopted (Hoksbergen, 2011). The Hopewell Ceremonial Complex, characterized by large geometric earthworks and conical mounds, developed in the Ohio River Valley during the end of the Middle Woodland Period, and is represented in the northern Alabama region as the Copena Mortuary Complex (Dumas, 2015).

Prehistoric culture throughout the southeast underwent a radical shift around 1,000 years ago as the Mississippian culture, originating in the Mississippi River Valley, spread eastward. An identifying feature of the Mississippian culture is the appearance of large, rectangular flat-topped platform mounds. These mounds served as the platforms for temples and other important buildings and were often arranged around an open plaza (Willey, 1966). A regional variant of the Mississippian culture was the Pensacola Culture, which arose in the Gulf Plain area and stretched from Pensacola, Florida, to Biloxi, Mississippi, including the Mobile River valley (Brown, 2017).

Native Americans living in Alabama during the early historic period were the Choctaw, who occupied the territory west of Mobile near the Alabama-Mississippi border; the Chickasaw, who lived north of them; and the Creek, who occupied northern and eastern Alabama. All were descended from the Mississippian people. With the Treaty of Cusseta, the Creeks gave up their territory in Alabama and were forcibly removed to Indian Territory in Oklahoma in 1836. A small group evaded capture, remaining in Alabama. The descendants of this group joined together and established the Poarch Band of Creek Indians, headquartered in Atmore, the only federally recognized tribe in Alabama (Hahn, 2015). The Choctaw ceded all their lands in the Treaty of Dancing Rabbit Creek and were removed to Oklahoma in 1831. A few thousand remained in Mississippi and Alabama, and their descendants formed the Mississippi and MOWA Bands of the Choctaw Indians. The MOWA are recognized by the state of Alabama and are seeking federal recognition (O'Brien, 2017). After signing a treaty with the federal government, the Chickasaw were removed to Oklahoma Territory in 1838, after purchasing the western half of the Choctaw reservation (O'Brien, 2019).

The Mabila Tribe occupied the Mobile delta and bay area at the time of European contact and were close allies of the French. The Mabila were likely affiliated with the Pensacola Temple Mound Culture (Brown, 2017). In the early 1700s, other displaced tribes from Florida and Mississippi moved to the Mobile delta seeking protection from the French. When Mobile came under British control in 1763, many of the local Indians left the area, either moving west into Spanish territory or joining the Choctaw (Brown, 2001).

The Spanish began exploring the Gulf of Mexico in the early 16th century, and likely sailed into Mobile Bay; however, Hernando de Soto is the first explorer to offer a definitive account of the area (Galloway, 1995). In 1701, the French built Fort Louis de la Louisiane and established a small colony at Twenty-seven Mile Bluff, 27 mi. upriver from Mobile Bay (Thomason, 2001). Toward the end of the first decade, however, it became clear that this inland delta location was not ideal, and a decision was made in 1711 to build a new fort downriver at the head of Mobile Bay, where Mobile exists today, and move the fledgling French settlement to that location (Waselkov, 2000).

This was an improvement, as it made communicating with other colonies much easier and was closer to the growing port on Dauphin Island. Over the next decade, however, Port Dauphin suffered multiple misfortunes, and in 1719, the settlement was abandoned. In 1723, the French began construction of a new 11-acre stone fort in the shape of a four-pointed star. Named Fort Condé in honor of Louis Henri de Bourbon, Duke of Bourbon, Prince of Condé, this fort was able to house more than 200 men (Kirkland, 2017). The new town of Mobile and Fort Condé served as the capital of French Louisiana until 1763 (Mistovich & Knight, 1983; Waselkov, 1990).

At the conclusion of the Seven Year's War in 1763, the English took control of Fort Conde and renamed it Fort Charlotte, after the new wife of George III. In 1780, Mobile changed hands again when Spain defeated the English and claimed the territory east of the Mississippi River (Kirkland, 2016). Following the war of 1812, Mobile came under the jurisdiction of the United States, first as part of the Mississippi Territory, and then as part of the newly created state of Alabama in 1819. During this time, it rapidly became an international port, when hundreds of settlers purchased tracts of land. During the Antebellum period, Mobile became the major exporting center for Alabama to markets in the northeast and Europe (Kirkland, 2016). As businesses began to flourish in the 1820s, Mobile began to expand south; Fort Charlotte was demolished in 1823 to make way for newly platted streets. The bricks and other debris from the fort were deposited in the marshy waterfront along Water Street (Seacat & Maygarden, 2011).

At 10 ft. deep, Mobile Bay had always been too shallow for deep draft ships to enter. As early as the 1850s, the USACE developed plans to create a ship channel to allow larger ships to enter the port. From 1870 on, the USACE created, deepened, and widened the channel to its current depth of 45 ft. In the late 1800s, the cotton trade gradually declined, while shipbuilding and importing fruit from Latin America became the main drivers of the local economy (Kirkland, 2020; Mistovich & Knight, 1983). By 1904, three railroad tracks extended through the city, with spurs to many of the waterfront industries (Sanborn Map Company, 1904).

The Alabama Dry Dock Company and Shipbuilding (ADDSCO) was established in 1916 and became one of the largest employers in the city at the time (Kirkland, 2020). Residential expansion occurred south of downtown during the 1920s, to house waterfront industrial workers (Seacat & Maygarden, 2011). ADDSCO was located on the north end of Pinto Island and ultimately expanded to include the entire west side of Pinto Island. A ferry transported ADDSCO workers from downtown Mobile to Pinto Island. During World War II, ADDSCO increased its workforce tenfold, and the city's overall waterfront workforce exceeded 89,000. During this time, the company added new dry docks, constructed 20 Liberty Ships and 102 oil tankers, and retrofit 2,800 vessels for combat. After the war ended, the company laid off all but 2,000 workers, though it continued to repair ships until it received a Navy contract in 1967 to produce rescue ships (Kirkland, 2015). Downtown residential neighborhoods declined in population after World War II, as people moved to other sections of the city.

Today, two major shipyards in the study area are Alabama Shipyard LLC, located on the north half of Pinto Island, and Modern American Recycling Services (MARS), located on the west side of the Mobile River channel. ADDSCO shipyard facilities that once occupied the shore at the south end of Pinto Island are gone, and the shoreline area appears unused, except for the Pinto Island Port facility at the far south, outside of the study area. The MARS facility occupies approximately three-quarters of the western waterfront portion of the study area, with Gulf Coast Vending Services and a vacant waterfront lot at the north end of the study area. MARS currently consists of several long buildings paralleling Water Street and a large open yard with a floating dry dock at the south end. The 1924 Sanborn map does not show these buildings, and the configuration of the shoreline is substantially different; this area has undergone major modification since the 1920s. Aerial imagery also reveals that most of the western Mobile shoreline is armored, but occasional pier timbers are seen at the edge of the channel. Directly south of the MARS facility is a large Mobile Port facility, with derricks on the Mobile and Pinto Island sides of the channel. Current aerial imagery of Alabama Shipyards, LLC property compared to the 1924 Sanborn maps shows some of the historic ADDSCO buildings remaining (Main Office, Warehouses No. 2 and 3, Service Building, Machine Shop, Carpenter Shop, and a building adjacent to the latter), five of the seven piers, and one of three floating dry docks (Sanborn Map Company, 1924).

3.7.2.5.2 Cultural Resources Within the Study Area

A review of the records on file at the Office of Archaeological Research at the University of Alabama indicate that one archaeological site (MB-552) has been documented in the study area. This site is located in the northwest corner of the study area and consists of buried structural remains, brick walls, foundations, floors, pits, postholes, and wooden remains dating from the 18th through the 20th centuries. The NRHP eligibility of the site has not been determined. No sunken cultural resources or TCPs are known to exist within the study area.

The historic ADDSCO shipyard on Pinto Island containing dry docks and other facilities dating back to World War I and buildings dating from World War II, comprise a historic district with 13 contributing properties (BAE Maritime Historic District). The district is NRHP eligible under Criteria A and C for its association with the shipbuilding industry in Mobile and the architectural styles of the buildings (DOT, 2014).

The Mobile Bay estuary and rivers also form a complex historical environment with a high potential for submerged cultural resources. Historic research has documented the presence of at least 137 historic shipwrecks near Mobile (Tidewater Atlantic Research, 2006). However, much of the study area currently contains fill soil, save for a strip of low-lying mucky peat (Lafitte Muck), which extends through the north central part of Pinto Island to the east (Soil Survey Staff, n.d.). Historic maps show that Pinto island and the Mobile shorelines are substantially altered from when they were first mapped over 100 years ago.

3.7.3 Environmental Consequences

3.7.3.1 No Action Alternative

Ex-Enterprise is currently located at Newport News Shipbuilding, a commercial facility in Newport News, Virginia. As described in Section 2.3.1 (No Action Alternative), under the No Action Alternative, ex-Enterprise would remain in waterborne storage at this location for an indefinite period of time. Because ex-Enterprise would not be moved from its current location, no impacts on cultural resources would occur under the No Action Alternative as the type of actions required to prepare and keep a ship in long-term storage in water would not impact any documented architectural resources. Additionally,

the study area in Virginia does not contain any archaeological sites or TCPs that would be impacted by the No Action Alternative.

3.7.3.2 Alternative 1: Single Reactor Compartment Packages

As described in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages), eight single reactor compartment packages would be constructed at PSNS & IMF in Bremerton for disposal at the DOE Hanford Site located within the study area. The reactor compartment packages would be transferred to Trench 94 via an approximately 25 mi. transport route from Port of Benton barge slip through the PNNL site and the DOE Hanford Site to Trench 94.

Under Alternative 1, a concrete rail support system would be used to place the reactor compartment packages in Trench 94 at the DOE Hanford Site. Additional rail structures would be added within Trench 94 to support the single reactor compartment packages, requiring limited excavation of the trench floor. The study area at Trench 94 does not contain any known archaeological resources that would be impacted as a result of the excavation activities and, due to the current depth of the trench floor, no impacts on unknown subsurface archaeological deposits from the installation of the rail structures are anticipated. Under Alternative 1, no modifications or improvements would be required to the barge slip or the transport route. Because the transport route would be utilized in its current condition, in accordance with the original design of the roadways and consistent with how the road is currently utilized, no impacts on cultural resources are expected to occur for the land transport of reactor compartment packages from Port of Benton barge slip to Trench 94 at the DOE Hanford Site under Alternative 1.

3.7.3.3 Alternative 2: Dual Reactor Compartment Packages

Under Alternative 2, the transfer of reactor compartment packages to Trench 94 would occur along the same approximately 25 mi. transport route from Port of Benton barge slip through the PNNL site and the DOE Hanford Site. However, as described in Section 2.3.3 (Alternative 2 – Dual Reactor Compartment Packages), infrastructure modifications to the Port of Benton barge slip and improvements to the transport route would be required because of the heavier weight and larger size of the four dual reactor compartment packages that would be transported to Trench 94 at the DOE Hanford Site.

As described in Section 2.3.3.6 (Port of Benton Barge Slip Modifications), infrastructure modifications to the Port of Benton barge slip involve widening and lengthening the barge slip (in-water work) and inland-only pile driving and concrete work. No archaeological resources have been identified within the land portion of the barge slip modification area, and subsurface testing efforts conducted at the barge slip have shown that subsurface cultural resources are unlikely. The slip itself was constructed in 1972 and has not yet been evaluated for NRHP-eligibility. The barge slip modifications necessary to support Alternative 2 have the potential to impact cultural resources if the barge slip were to be determined eligible for listing in the NRHP.

As described in Section 2.3.3.7 (Road Modifications between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site) and shown on Figure 2-16, proposed improvements to the transport route include several areas of cutting and filling to adjust side-slope transitions and reduce vertical curves at 11 locations to support dual reactor compartment packages that could weigh up to 3,304 tons and be carried by larger transporters. Road improvements within the 11 locations would also include activities such as paving medians and filling road shoulders to improve intersections. Under Alternative 2, the same cultural resources are within the transport route portion of the study area as

Alternative 1. As discussed in Section 3.7.3.2 (Alternative 1: Single Reactor Compartment Packages) above, no impacts on cultural resources are expected to occur for the land transport of reactor compartment packages from the barge slip to Trench 94 at the DOE Hanford Site outside of the improvement areas.

The Richland Irrigation Ditch (45BN1125) crosses the transport route at Location 2. At this location, road improvements would involve the placement of fill for the gradual vertical curve transition at the intersection with George Washington Way. While the fill is proposed to be placed only within the disturbed area of the roadways, potential impacts on the cultural resource could occur from temporary construction and staging activities.

At Location 7, the DOE Hanford Site Plant Railroad (45BN1107) crosses the transport route approximately 330 ft. (100 meters) south of the proposed road improvements. At this location, the filling in of a dip in the road and paving of the median is proposed, both of which would occur within the existing roadway. As such, no impacts on the railroad are expected from the fill and paving activities, but impacts from temporary construction and staging activities could occur.

Location 8 is within the boundaries of the Hanford Construction Camp (45BN0308); a NRHP-eligible Historic District. At Location 8, the adjustment of the side-slope transition is proposed by filling the southbound lanes of the transport route. The Hanford Irrigation Ditch (45BN309), a contributing component of the Historic District and a NRHP-eligible resource, intersects the road at Location 8, and unevaluated archaeological site 45BN1142, also associated with Historic District, is located within the study area near the improvement area. While the proposed fill and paving activities to adjust the side-slope transition at Location 8 are proposed to occur within the existing roadway, away from the known cultural resource locations, temporary construction and staging activities may potentially impact the resources.

At Location 9, an adjustment to the side-slope transition on both sides of the railroad crossing (Hanford Site Plant Railroad; 45BN1107) is proposed by either filling eastbound lanes or cutting westbound lanes, or by filling westbound lanes or cutting and paving eastbound lanes. The DOE Hanford Site Plant Railroad has been determined eligible for listing on the NRHP. While all cut and fill activities to improve the side-slope transition are proposed to occur within the road shoulder away from the railroad crossing, potential impacts on the railroad from transport route improvement activities may occur from temporary construction and staging activities.

In addition to the potential impacts on known cultural resources within the study area at Locations 2, 7, 8, and 9, impacts on unknown intact subsurface archaeological deposits may occur where proposed transport route improvements may involve cut or excavation activities at Locations 3, 4, 6, 9, and 11, or by the placement of fill material at Locations 1, 2, 4, 5, 8, 10, and 11. Potential impacts may also occur to the PDA and to TCPs that may be within the study area at the transport route improvement locations.

3.7.3.4 Alternative 3 (Preferred Alternative): Commercial Dismantlement

Under Alternative 3 (Preferred Alternative), the complete dismantling of ex-Enterprise would consist of removing mechanical, hydraulic, and/or electronic components that have potential market value for resale or reuse and then physically cutting the remainder of the hull to allow the recycling of metals and other material by sale to salvage yards or smelters. As described in Section 2.3.4 (Alternative 3 [Preferred Alternative] – Commercial Dismantlement), dismantlement would include cutting apart the eight reactor plants into segments for packaging into several hundred small containers that would fit

into typical shipping containers, and these would subsequently be disposed of at a DOE and/or authorized commercial low-level radioactive waste facility.

The complete dismantlement of ex-Enterprise would occur at a commercial ship dismantling facility located in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama. While the specific facility for commercial dismantlement has not been identified, dismantling would occur within the controlled industrial boundary of a commercial ship dismantling facility as part of an ongoing program, consistent with normal shipyard work. The Navy would place a contract to dismantle ex-Enterprise at a commercial facility, and the Navy envisions implementing the Nuclear Regulatory Commission (NRC) decommissioning process for radioactive material licensees described in the NRC Consolidated Decommissioning Guidance (NUREG-1757), with direct support from the NRC. Within the Hampton Roads Metropolitan Area study area, numerous government and commercial vessels have been constructed and/or deactivated at the five pier areas and in the four dry docks at Newport News Shipbuilding, and multiple dismantling facilities exist within the Brownsville and Mobile study areas capable of ship dismantlement work. The current commercial dismantlement facilities are capable of ship dismantlement work, and no commercial facility would need permanent infrastructure to accommodate the ex-Enterprise dismantlement. As such, the complete dismantlement of ex-Enterprise would not impact any of the known cultural resources within the study areas and involves no activities of the type that historic properties could be affected within Newport News Shipyard and Dry Dock Company site, Port of Brownsville Historic District, or the BAE Maritime Historic District within the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; and Mobile, Alabama study areas, respectively. While there is potential for unknown buried archaeological sites or submerged cultural resources, no infrastructure improvements to the selected facility are anticipated for the Proposed Action and alternatives, and the discovery of buried or submerged cultural resources is unlikely. As such, no impacts on subsurface or underwater archaeological sites are expected to occur under Alternative 3 (Preferred Alternative).

3.7.4 Mitigation

While ex-Enterprise is eligible for listing in the NRHP, when the Navy fulfills the remaining requirements of the Program Comment upon designating final disposition, the Navy will have met its responsibilities under Section 106 of the NHPA to take into account the effect of the Proposed Action on the NRHP-eligible ex-Enterprise. No further mitigation is required.

All ex-Enterprise disposal activities related to the Proposed Action and alternatives would comply with applicable federal, state, and local environmental and health laws and regulations, and existing cultural resources management plans. As no impacts on cultural resources are reasonably foreseeable under the No Action Alternative, Alternative 1, or Alternative 3 (Preferred Alternative), no mitigation measures are required. Under Alternative 2, potential impacts on known cultural resources related to transport route improvements between Port of Benton barge slip and Trench 94 at the DOE Hanford Site would be identified through consultation and additional Section 106 review, and minimized by the avoidance of documented archaeological resource locations during design of the transport route improvements at Locations 2, 7, 8, and 9. Potential impacts on cultural resources related to barge slip modifications would be identified through additional Section 106 review, including mitigation to resolve adverse effects. Impacts on unknown or buried intact archaeological sites within the proposed transport route improvement locations would be minimized by the presence of a qualified archaeological monitor meeting Secretary of the Interior Professional Qualifications Standards, as promulgated in 36 CFR Part 61 for all activities at the proposed transport route improvements. Additional mitigation measures

identified at the time of the Record of Decision would be described in that document should Alternative 2 be selected.

3.7.5 Summary of Impacts and Conclusions

Table 3.7-1 summarizes the potential impacts of the alternatives on cultural resources.

Table 3.7-1: Summary of Impacts and Conclusions on Cultural Resources

Potential Impacts on Cultural Resources	Alternatives			
	No Action	1	2	3
Impacts on surface archaeological resources			◑	
Impacts on subsurface archaeological resources			◑	
Impacts on submerged or sunken archaeological resources				
Impacts on architectural resources			◑	
Impacts on TCPs			◑	

Notes: ◑ = Potential impact but reduced as a result of project design changes, implementation of current or proposed best management practices, monitoring, or mitigation; Blank = no impact/not applicable;
TCP = Traditional Cultural Property

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3.8 Noise

This section of the Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) describes potential impacts related to noise as a result of the Proposed Action and alternatives. Types or sources of noise and the effects of noise on people and associated sensitive receptors in the human environment are discussed in this section. Noise in relation to biological resources, as well as how sound propagates in water, is discussed in Section 3.5 (Biological Resources).

Sound consists of minute vibrations that travel through a medium, such as air or water, and can be sensed by the human ear. Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels can cause hearing loss, the principal human response to noise is annoyance. Response to noise varies, depending on the type and characteristics of the noise, distance between the noise source and whoever hears it (the receptor), receptor sensitivity, and time of day. A noise sensitive receptor is defined as a land use where people involved in indoor or outdoor activities may be subject to stress or considerable interference from noise. Such locations or facilities often include residential dwellings, hospitals, nursing homes, educational facilities, and libraries.

3.8.1 Methodology

3.8.1.1 Region of Influence

The project Region of Influence (ROI) includes all areas where noise is generated by activities under all alternatives. However, identifying the ROI for each particular alternative requires knowledge of the type of noise-generating activity, noise levels of equipment, length of time the noise would be generated, and proximity to sensitive receptors. The ROI for the No Action Alternative includes Newport News, Virginia. The ROI for Alternatives 1 and 2 (the reactor compartment packaging alternatives) includes the following:

- the tow route from the current location of ex-Enterprise in Newport News, Virginia, to commercial dismantlement facilities in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama;
- the heavy-lift ship transit route from the commercial dismantlement facility to Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) and surrounding areas;
- the barge transit route from PSNS & IMF to the Port of Benton barge slip;
- the multiple-wheel, high-capacity transporter transit route from the barge slip to Trench 94 at the Department of Energy (DOE) Hanford Site; and
- Richland, Washington, and surrounding areas.

The ROI for Alternative 3 (Preferred Alternative) includes the following:

- the tow transit route from the current location of ex-Enterprise in Newport News, Virginia, to a commercial dismantlement facility at Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama;
- the commercial dismantlement facilities and surrounding areas;
- travel corridors to the potential waste facilities; and
- the potential waste facilities themselves.

3.8.1.2 Regulatory Framework

3.8.1.2.1 Noise Control Act

The Noise Control Act of 1972, as amended, directs all federal agencies to carry out programs within their jurisdiction in a manner that promotes an environment free from noise that jeopardizes health and welfare, to the fullest extent within agency authority.

3.8.1.2.2 Federal Interagency Committee on Urban Noise

The federal government suggests land-use compatibility criteria for different noise zones; however, land-use compatibility is regulated at the local level. Based on the guidelines in the Federal Interagency Committee on Urban Noise (1980), residential areas and schools are considered compatible where the Day-Night average sound level (DNL) is less than or equal to 65 A-weighted decibels (dBA). Outdoor recreational activities are compatible with noise levels less than or equal to 70 dBA. Parks are compatible with noise levels less than or equal to 75 dBA (Federal Interagency Committee on Urban Noise, 1980).

3.8.1.2.3 United States Environmental Protection Agency Noise Standards

The United States (U.S.) Environmental Protection Agency (EPA) determined a 24-hour exposure level of 70 decibels (dB) as the level of environmental noise at which no measurable hearing loss would be expected to occur over a lifetime (EPA, 1974). This exposure level is also the threshold for hearing loss avoidance.

3.8.1.2.4 Federal Highway Administration Noise Standards

Noise standards, regulations, and policies related to highway traffic noise have been adopted by the Federal Highway Administration. The administration's Roadway Construction Noise Model User's Guide provides a useful methodology to evaluate construction (including demolition) noise impacts and is used in this analysis (Federal Highway Administration, 2006).

3.8.1.2.5 U.S. Occupational Safety and Health Administration

29 Code of Federal Regulations contains the principal set of rules and regulations from the U.S. Occupational Safety and Health Administration issued by federal agencies regarding occupational noise exposure. Specifically, regulations and standards governing general industry are provided in 29 Code of Federal Regulations Part 1910.95.

3.8.1.2.6 Navy Safety and Occupational Health Program

The Navy Occupational Safety and Health Program addresses the maintenance of safe and healthful conditions in the workplace or the occupational environment. It applies to all Navy civilian and military personnel and operations ashore or afloat. Chief of Naval Operations Manual 5100.23D, the Navy Occupational Safety and Health Program Manual, is the basic Navy Safety and Occupational Health Program document used to carry out the program. It refers to both afloat and shore commands.

3.8.1.3 Best Management Practices

Naval Facilities Planning in the Noise Environment (Publication P-970) provides allowable noise levels and guidance for selecting a site for new facilities within the noise environment of military installations. The document also discusses noise reduction techniques to render marginally acceptable locations suitable for use (Naval Facilities Engineering Command, 1978).

3.8.1.4 Approach to Analysis

This EIS/OEIS evaluates the potential impacts resulting from noise produced from the proposed dismantlement and disposal of ex-Enterprise under three alternatives for the Proposed Action, as well as potential impacts under a No Action Alternative. Additional information on the effects of noise on biological resources is provided in Section 3.5 (Biological Resources) of this EIS/OEIS. Based on discussions in Chapter 2 (Description of Proposed Action and Alternatives) and because transportation of waste and recyclable materials would not markedly increase regional traffic, the movement of waste from the selected commercial dismantlement facility to an approved waste disposal or recycling facility is only briefly described in this section.

3.8.1.4.1 Basics of Sound

The loudest sounds detected comfortably by the human ear have intensities a trillion times higher than sounds that can barely be detected. Therefore, using a linear scale to represent sound intensity is not feasible. The dB is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. The most common scale for characterizing sound is the dBA, which gives greater weight to the frequencies of sound to which the human ear is most sensitive. It is correlated with annoyance caused by noise sources such as traffic and construction. Figure 3.8-1 provides typical A-weighted noise levels in various indoor and outdoor environments.

Some noise sources (e.g., air conditioner, vacuum cleaner) are measured as continuous sounds that maintain a constant sound level for a period of time. Other sources (e.g., automobile, heavy truck) are measured by the maximum sound produced during an event, such as a vehicle passing by. Other sounds (e.g., urban daytime, urban nighttime) are measured as averages taken over extended periods of time. A variety of noise metrics have been developed to describe noise over different time periods, as discussed below.

3.8.1.4.2 Noise Metrics

A metric is a system for measuring or quantifying a particular characteristic of a subject. Since noise is a complex physical phenomenon, multiple noise metrics help to more accurately quantify the noise environment. The noise metrics used in this EIS/OEIS are summarized below.

3.8.1.4.3 Day-Night Average Sound Level

The DNL metric is the energy-averaged sound level measured over a 24-hour period, with a 10 dB penalty assigned to noise events occurring between 10 p.m. and 7 a.m. (acoustic night). DNL values are average quantities, mathematically representing the continuous sound level that would be present if all variations in sound level that occur over a 24-hour period were averaged to have the same total sound energy. DNL is the standard noise metric used by the U.S. Department of Housing and Urban Development, Federal Aviation Administration (FAA), EPA, and the Department of Defense. Most people are exposed to sound levels of 50–55 DNL or higher on a daily basis. Research indicates about 87 percent of the population is not highly annoyed by outdoor sound levels below 65 dB DNL (Federal Interagency Committee on Urban Noise, 1980). The FAA is currently evaluating the accuracy of the Federal Interagency Committee's research on noise exposure-annoyance relationships for aircraft noise. Recent analyses and an FAA-sponsored survey suggests that the current U.S. public perception of aviation noise is more sensitive than presented in the noise-annoyance curves currently used to determine significance under the National Environmental Policy Act. However, the survey results will not

affect ongoing National Environmental Policy Act environmental reviews, as FAA is not proposing any immediate policy changes. Therefore, the 65 dB DNL noise contour is used to determine compatibility of military operations with local land use.

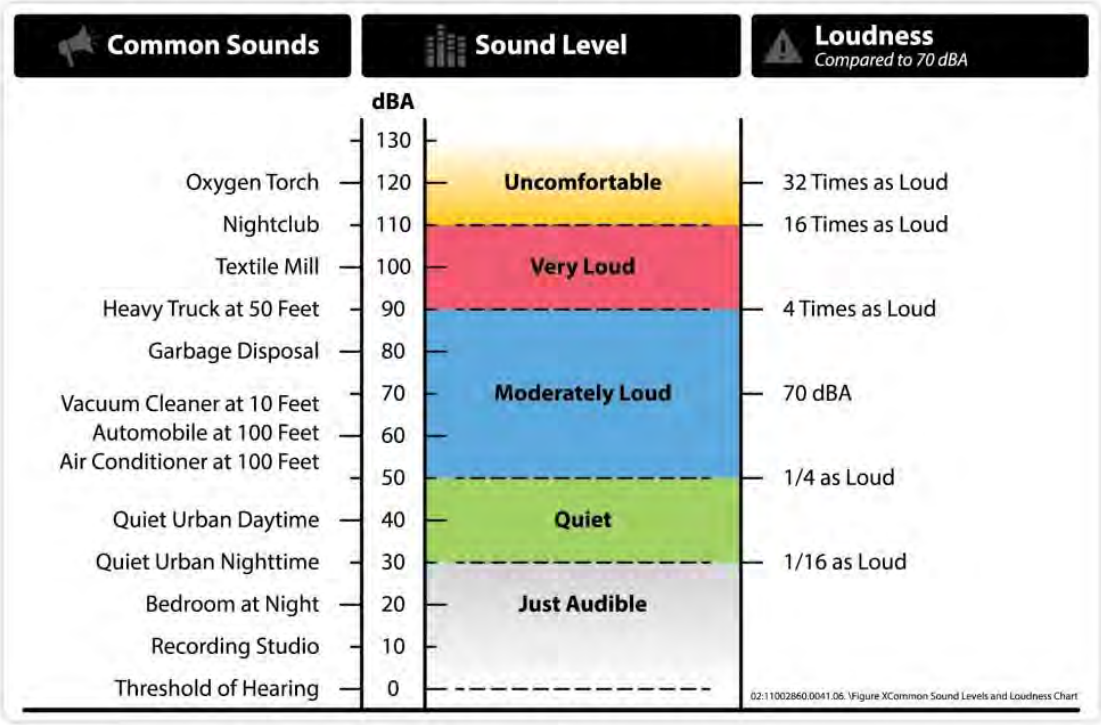


Figure 3.8-1: Typical A-Weighted Environmental Noise Levels

3.8.1.4.4 Equivalent Sound Level

The Equivalent Sound Level, measured in dB, is a cumulative noise metric that represents the average sound level (on a logarithmic basis) over a specified period of time—for example, an hour, a school day, daytime, nighttime, weekend, facility rush periods, or a full 24-hour day (i.e., the equivalent sound level for a full 24-hour day is similar to the DNL metric but for the fact that the DNL metric includes the additional 10 dB for those events during acoustic night).

3.8.1.4.5 Noise Effects

Some studies have linked increases in noise with human health effects, such as hearing impairment, sleep disturbance, cardiovascular effects, and psychophysiological effects (USACE, 2012; Van Kempen et al., 2002)[1]. Both short- and long-term exposure to very loud noises and long-term exposure to lower levels of sound (chronic exposure) can affect health. Damage to hair cells of the cochlea (the auditory portion of the inner ear) and hearing impairment can be caused by acute exposure to sounds greater than 120 dB (Babisch, 2005; Goelzer et al., 2001).

3.8.1.4.6 Propagation of Sound in the Environment

In an ideal setting in which sound propagates away from a point source in air without any outside influence (e.g., a barrier reflecting or attenuating the sound), sound energy radiates uniformly outward in all directions from the source in a pattern referred to as spherical spreading (noise in relation to

[1] USACE is an acronym for U.S. Army Corps of Engineers

biological resources, as well as how sound propagates in water, is discussed in Section 3.5, Biological Resources). As sound energy propagates away from the sound source, both the sound level and frequency change. For each doubling of distance from the source, the sound level attenuates (or drops off) at a rate of 6 dBA.

When a sound is not from a single point source but is instead from multiple sources along a line, like the noise made by the continuous movement of vehicles on a highway, the source of the sound appears to emanate from a linear source rather than from a point source. The sound level from a linear source decreases by approximately 3–4 dBA with a doubling of the distance from the source (Goelzer et al., 2001).

In a real-world setting, a number of factors can influence how sound propagates in the environment; the ideal case of spherical spreading is an approximation of reduction with distance. Wind is the single most important meteorological factor within approximately 500 feet (ft.) of the sound source, while vertical air temperature gradients are more important in sound propagation over longer distances. Other atmospheric conditions such as air temperature, humidity, and turbulence also can have a major effect on received sound levels.

Whether natural or man-made, a large object or barrier in the path between a sound source and a receptor can reduce sound levels substantially. The impact of this shielding depends on the size and material of the object as well as the frequency content of the sound source. Natural terrain, buildings, and walls can serve as noise barriers, often reducing sound levels by 5–10 dB.

3.8.2 Affected Environment

3.8.2.1 Washington

The areas considered for analysis of potential impacts from noise within Washington include PSNS & IMF, the transportation route from PSNS & IMF to the Port of Benton barge slip, and the land transport route from the barge slip to the final disposal location at the DOE Hanford Site. The following sections describe the affected environment potentially impacted by proposed activities at PSNS & IMF, the barge slip, and the land transport route from the barge slip to the final disposal location at the DOE Hanford Site.

3.8.2.1.1 Puget Sound Naval Shipyard & Intermediate Maintenance Facility, Washington

PSNS & IMF is a major tenant of Naval Base Kitsap in Bremerton, Washington. The eastern portion of Naval Base Kitsap is a fenced, high-security area known as the Controlled Industrial Area, which defines the PSNS & IMF operating area. PSNS & IMF is bordered on the south by Sinclair Inlet, and on the north and east by the city of Bremerton. The majority of PSNS & IMF is developed and covered with impervious surface. Most of the remaining, non-contiguous, undeveloped areas are also disturbed and typically landscaped with a mix of ornamental and native trees, shrubs, and lawn. Immediately north of PSNS & IMF is a mixed-use area, with several churches, residences, and schools. The closest residences are approximately 0.1 mile (mi.) from the dry dock areas of PSNS & IMF. The closest school and church are approximately 0.25 and 0.2 mi., respectively.

Noise is associated, generally, with any industrial facility. PSNS & IMF, especially in dry dock areas, resounds with noises associated with its operations, such as the movement of cranes, trucks, other heavy equipment, hand-operated tools, and the busy flow of traffic Virtually confined to the shoreline area, this noise does not adversely impact surrounding human populations or those portions of PSNS & IMF that are used for personnel quarters, food service areas, or similar activities.

3.8.2.1.2 Port of Benton Barge Slip, Washington

Within a radius of 1 mi. of the Port of Benton barge slip is a mix of residential; undeveloped desert shrub vegetation; industry, agency, and educational facilities; and irrigated agricultural operations. Small residential areas are present approximately 0.5 mi. east of the barge slip across the Columbia River and 0.25 mi. to the south of the barge slip. Upon review of the EPA NEPASSIST web mapper, no non-residential noise-sensitive receptors are located within 0.5 mi. of the project site. The closest school is approximately 1.5 mi. south of the barge slip. The Federal Engineers and Constructors office building is the nearest building to the barge slip, situated approximately 580 ft. west, southwest.

Current noise impacts are primarily due to motor vehicle traffic along roadways and seasonal recreational watercraft along the Columbia River. Agricultural noise impacts associated with irrigated farm operations are seasonal and of limited duration. Aircraft noise impacts exist from the Richland Airport, about 3.5 mi. away, and the Tri-Cities Airport near Pasco, about 9 mi. away. The Port of Benton barge slip receives periodic barge shipments resulting in temporary noise impacts from the operation of motorized equipment used to off-load the packages.

3.8.2.2 Virginia

3.8.2.2.1 Newport News, Virginia

Newport News Shipbuilding lies near the mouth of the James River, immediately west of Huntington and U.S. 664. Shipbuilding facilities have noises associated with their operations, such as the movement of cranes, trucks, other heavy equipment, hand-operated tools, and the busy flow of traffic in an industrial setting. Conditions surrounding the project site range from a highly populated urban area, to a heavily industrial area, to unpopulated water in the James River. Four churches and three schools, considered to be noise-sensitive receptors, are located within 0.5 mi. of the project site (EPA NEPASSIST web mapper). Current noise impacts are primarily due to motor vehicle traffic along roadways and seasonal recreational watercraft along the James River. Typical ambient levels in the residential areas immediately east of Newport News range from 61 to 65 dBA DNL (Virginia Department of Transportation, 2016).

3.8.2.3 Texas

Commercial dismantlement facilities are approximately 2 mi. from Brownsville, Texas, and is located approximately 6 mi. northeast of the Brownsville South Padre Island International Airport. Upon review of the EPA NEPASSIST web mapper, no non-residential noise-sensitive receptors are located within 0.5 mi. of the project site. The closest human sensitive receptors are residences, which are approximately 3 mi. east-southeast of the Brownsville facilities. Similar to PSNS & IMF, noise is associated with operations such as the movement of cranes, trucks, other heavy equipment, hand-operated tools, and the flow of vehicle and rail traffic in an industrial setting.

3.8.2.4 Alabama

Conditions surrounding the project site in Mobile, Alabama, range from a highly populated urban area, to a heavily industrial area, to unpopulated open water in Mobile Bay. Similar to PSNS & IMF, noise is associated with operations such as the movement of cranes, trucks, other heavy equipment, hand-operated tools, and the flow of vehicle and rail traffic in an industrial setting. Four churches, two schools, and four historic properties, considered to be noise-sensitive receptors, are located within 0.5 mi. of the project site (EPA NEPASSIST web mapper). With the exception of one historic property, all of these receptors are closer to Interstate-10 where traffic noise dominates the ambient noise environment.

3.8.3 Environmental Consequences

3.8.3.1 No Action Alternative

As described in Chapter 2 (Description of Proposed Action and Alternatives), ex-Enterprise would remain in waterborne storage indefinitely at its existing location in Newport News, Virginia. Storage facility staff would perform periodic inspections and maintenance of the ship while in storage, to include a detailed interior inspection annually, an underwater exterior inspection of the hull after every eight years in waterborne storage, and placement of the ship in dry dock for inspection and repair after every 15 years in waterborne storage. Further, no construction, dredging, or modifications to facilities or significant noise-generating activities are involved under the No Action Alternative. Therefore, there are no anticipated noise impacts under the No Action Alternative.

3.8.3.2 Alternative 1: Single Reactor Compartment Packages

3.8.3.2.1 Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility

As described in Chapter 2 (Description of Proposed Action and Alternatives), ex-Enterprise would be towed from its current berthing location at Newport News, Virginia to one of the three commercial dismantlement locations (Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama).

It is anticipated that at least two marine tug boats would be used to move the ship from Newport News, Virginia, to one of the three commercial dismantlement facilities. The proposed route is from the mouth of the James River into the Atlantic Ocean, and follows the coastline to a dismantlement location. Towing with commercial tugs has minimal noise. Noise levels from tugs have been documented to be approximately 87 dBA at a distance of 50 ft. At a distance of 1,600 ft., the received noise level would be less than 60 dBA, and would continue to decrease with increasing distance from the shore. Towing activities under Alternative 1 are not expected to contribute to the onshore noise environment, regardless of tow distance. Further, no construction, dredging, or modifications to facilities or significant noise-generating activities would be involved during the initial transport under Alternative 1. Therefore, there are no anticipated noise impacts associated with the initial transport of ex-Enterprise.

3.8.3.2.2 Partial Dismantlement at Commercial Dismantlement Facility

Once at the dismantlement facility, the selected contractor would partially dismantle and recycle ex-Enterprise using established processes and techniques. The aircraft carrier dismantling contracts by the U.S. Department of the Navy (Navy) include a clause requiring compliance with all applicable federal, state, and local environmental and occupational safety and health laws and regulations. Commercial dismantlement facilities in the proposed locations currently perform ship dismantlement work, so no new noise-generating activities would occur at the selected contractor facility. Community noise levels (Day-Night Levels) in surrounding communities are not anticipated to change.

3.8.3.2.3 Transport Waste and Recyclable Materials from Commercial Dismantlement Facility to an Approved Waste Disposal or Recycling Facility

Under Alternative 1, partial dismantlement would create waste and recyclable materials that require proper disposal. As described in Chapter 2 (Description of Proposed Action and Alternatives), it is anticipated that these materials would be contained in container express (CONEX) boxes for shipment over the course of the partial dismantlement process. Transport from the dismantlement facility to the disposal site would occur by trucks. The use of semi-trucks on highways is not anticipated to change the acoustic environment surrounding the transportation corridors because typical public use is high, with many

vehicles traversing the road per day. Highway traffic noise typically averages 75 dBA at a distance of 50 ft. from the highway. Businesses and residences are typically set back 300 ft. from highways and receive sound levels of approximately 67 dBA (using the sound propagation loss of 3 dB per doubling of distance).

In a typical hour, the traffic volume would need to double to increase the noise level by 3 dB. Trucks would not travel to the waste facility at the same time but rather as they are prepared and loaded at the dismantlement site over the course of several years. The number of trucks prepared and loaded at the dismantlement site per day would not double the traffic volume, nor increase traffic such that average noise levels would notably increase. Therefore, no noise impacts are anticipated from the transportation of waste or recyclable materials.

3.8.3.2.4 Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility

The Navy would relocate the propulsion space section from the commercial dismantlement facility via heavy-lift ship that would transit through established shipping lanes around the southern tip of South America, north along the west coast of the United States, into the Strait of Juan de Fuca, and into PSNS & IMF. By using established shipping lanes and staying more than 200 nautical miles offshore for most of the route, noise associated with ship transit would occur far from shore. Therefore, no noise impacts are anticipated from the relocation of the propulsion space section via heavy-lift ship to PSNS & IMF.

3.8.3.2.5 Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages (No In-Water Work)

Once at PSNS & IMF, the Navy would dismantle the propulsion space section and construct eight single reactor compartment packages for disposal. PSNS & IMF facilities currently dismantle ships and, aside from the larger size of ex-Enterprise, no new noise-generating activities would occur at the facility. Therefore, noise from work at PSNS & IMF is not anticipated to change the Day-Night Levels in surrounding communities.

3.8.3.2.6 Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site

As described in Section 2.3.2.6 (Install Rail System for Reactor Compartment Packages in Trench 94 at the Department of Energy Hanford Site), additional rail structures would be added within Trench 94 at the DOE Hanford Site to support the single reactor compartment packages, requiring limited excavation of the trench floor. Given the lack of sensitive receptors in the vicinity of Trench 94 at the DOE Hanford Site, noise impacts from rail installation are not anticipated.

3.8.3.2.7 Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to the Port of Benton Barge Slip

As described in Section 2.3.2.7 (Barge Transport of Reactor Compartment Packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility to Port of Benton Barge Slip), the waterborne portion of the transport route follows deep-water shipping lanes from PSNS & IMF, westerly through the Strait of Juan De Fuca (in U.S. territorial waters), and southerly down the Washington coast to the mouth of the Columbia River. The route then leads up the Columbia River, following the shipping channel used for the regular transport of commercial cargo.

In the past, and as reflected in the *2012 Final Environmental Assessment on the Disposal of Decommissioned Defueled Naval Reactor Plants from USS ENTERPRISE (CVN 65)* and *1996 Final*

Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants (Navy & DOE, 1996, 2012), these activities have had no associated noise impacts on the surrounding communities or sensitive receptors. Given the similarity of the previous actions, no new impacts from noise-generating activities during the barge transport are anticipated.

3.8.3.2.8 Land Transport of Reactor Compartment Packages from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site

Each reactor compartment package would be off-loaded at the Port of Benton barge slip and transported via multiple-wheel, high-capacity transporter to the disposal site via the same transport route as used for various cruiser and submarine reactor compartment packages. In the past, and as reflected in the 2012 *Final Environmental Assessment on the Disposal of Decommissioned Defueled Naval Reactor Plants from USS ENTERPRISE (CVN 65)* and 1996 *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants* (Navy & DOE, 1996, 2012), these activities have had no associated noise impacts on the surrounding communities or sensitive receptors. Given the similarity of the previous actions, no new impacts from noise-generating activities during the off-load are anticipated.

Alternative 1 includes transportation and disposal activities that have occurred in the past with little to no noise impacts. Additionally, methodologies and compliance with applicable federal, state, and local environmental and occupational safety and health laws and regulations would continue under Alternative 1. Therefore, because of the historical lack of noise impacts from transportation, and that there are no new activities proposed, Alternative 1 noise-generating activities that would degrade the acoustic environment are not anticipated.

3.8.3.3 Alternative 2: Dual Reactor Compartment Packages

Under Alternative 2, all components of the activity in common with Alternative 1 would have the same noise impacts as Alternative 1. However, because Alternative 2 proposes the construction of four larger and heavier dual reactor compartment packages instead of eight, single reactor compartment packages, the Port of Benton barge slip would require modification as would the road between the barge slip and Trench 94 at the DOE Hanford Site, Washington, to facilitate the passage of dual reactor compartment packages. Noise impacts under Alternative 2 would be the same as under Alternative 1 except for reactor compartment package shipment, the barge slip modifications, and the road improvements. Four fewer packages would result in four fewer shipments and off-loading activities, which lessens the noise in comparison to shipments under Alternative 1. However, construction of barge slip modifications and road improvements would temporarily increase noise levels. The sections below detail potential noise impacts from barge slip modifications and road improvements.

3.8.3.3.1 Port of Benton Barge Slip Modifications

Under Alternative 2, the Navy proposes to modify the existing Port of Benton barge slip on the west shoreline of the Columbia River in Richland, Washington. The barge slip would be modified to accommodate the larger barge required for dual reactor compartment packages. The slip would be widened 18 ft. and extended by 15 ft., making the new slip 80 ft. wide and 165 ft. long. All construction would be completed in the course of a year, with pile driving taking a few months. The widening would require the removal of the south jetty. A 70 ft.-long sheet pile wall would be tied into the south edge of the current slip face. This wall would be constructed of approximately 11 sheet piles driven with a

vibratory hammer 50–65 ft. into the soil, and would end up at 0–15 ft. above the river bed. The sheet piles would be vibrated into the ground prior to the removal of the jetty.

The existing slip headwall would need to be strengthened to handle the increased weight of the larger loads. To strengthen the headwall the Navy would place 24 landside pipe piles 30-inches in diameter, spaced 10 ft. apart using an impact hammer. A concrete slab would be placed on top of the piles. The new slab would be level with the existing sill cap and soil anchor slabs. No widening of the road would be needed.

There are currently several groups of noise-sensitive receptors in the area of the project site. The nearest sensitive receptor is the commercial building for the Federal Engineers and Constructors, located approximately 500 ft. west of the project area. The closest residential area is located approximately 860 ft. south of the project area along the Columbia River. The second-closest residential area is located approximately 0.5 mi. east of the project area across the Columbia River. Due to this distance, noise impacts from construction are anticipated to be audible, though not high enough to meaningfully impact the DNL levels at this location.

Construction would involve using diesel-powered heavy equipment for tasks, including limited excavation, delivering materials, driving pipe piles, mixing concrete, backfilling excavated areas, and re-graveling affected areas of the roadway. Temporary noise levels between 74 and 90 dBA at a distance of 50 ft. could be generated by earth-moving equipment (e.g., excavators, backhoes, and trucks). Based on data for typical noise ranges (Washington State Department of Transportation, 2012), materials-handling equipment (e.g., concrete mixers) could generate noise levels ranging from 77 to 81 dBA at 50 ft. Therefore, in general, noise levels generated from non-pile driving construction activities could range from 74 to 89 dBA at 50 ft. (Table 3.8-1).

Both vibratory and impact pile drivers are proposed for use during barge slip modifications. Vibratory pile drivers are proposed to be used to drive sheet piles into the south edge of the current slip face. A vibratory pile driver has a set of jaws that clamp onto the top of the pile. The pile is held steady while the hammer vibrates the pile to the desired depth. Because vibratory hammers are not impact tools, noise levels are typically not as high as with impact pile drivers (see Table 3.8-1). Further, vibratory pile driving would be performed on land prior to the jetty being removed.

Driving steel pipe piles with an impact pile driver would be one of the loudest components of the project. A typical diesel impact pile driver generates an average noise level of approximately 110 dBA maximum sound level at 50 ft. (see Table 3.8-1) (Washington State Department of Transportation, 2012). The drop-off rate for construction equipment during a single event and stationary noise sources is approximately 6 dBA per doubling of distance. These drop-off rates assume no obstructions, which would increase the noise drop-off rate. The worst-case noise level generated by pile driving (110 dBA maximum sound level at 50 ft.) was calculated based on a conservative 6 dBA drop-off rate. Typical maximum noise levels would be much lower farther away from the construction site or when louder construction methods such as pile driving are not occurring. Additionally, the local topography may also play a role in further reducing the sounds emanating from the construction site, as the site is approximately 45 ft. below the surrounding area at the bottom of an excavated road cut. This would naturally reduce the amount of noise coming from the construction site.

Table 3.8-1: Anticipated Construction Equipment Used and Typical Sound Levels

Equipment Description	Impact Device?	Actual Measured Average dBA L_{max} at 50	Approximate Received dBA L_{max} at 300 feet
Impact Pile Driver	Yes	110	94
Vibratory Pile Driver	No	105	89
Concrete Saw	No	90	74
Pavement Scarifier	No	90	74
Grader	No	89	73
Jackhammer	Yes	89	73
Auger Drill Rig	No	84	68
Scraper	No	84	68
Tractor	No	84	68
Compactor (ground)	No	83	67
Dozer	No	82	66
Concrete Pump Truck	No	81	65
Crane	No	81	65
Excavator	No	81	65
Generator	No	81	65
Roller	No	80	64
Concrete Mixer Truck	No	79	63
Front End Loader	No	79	63
Backhoe	No	78	62
Paver	No	77	61
Dump Truck	No	76	60
Pickup Truck	No	75	59
Flat Bed Truck	No	74	58

Note: dBA = A-weighted decibels, L_{max} = maximum sound level.
Source: (Washington State Department of Transportation, 2012)

Impact pile driving typically occurs over a short period of time (typically between 15 minutes and an hour) with a break between the driving of each pile-segment as well as breaks to reposition between pile driving locations. Impact pile driving has the highest potential for a detrimental noise impact and would generate the loudest construction noise, about 94 dBA at 300 ft. from the construction zone, based on calculations with a conservative 6 dB drop-off rate per doubling of distance. Areas surrounding the project are zoned for commercial and residential use; thus, potential detrimental impacts on residential zones are possible from pile driving. Sound levels from pile driving at the closest residential area (approximately 860 ft. south) are expected to be near 86 dBA. At these levels, it is anticipated that pile driving noise would represent an intrusive event in the sound environment. However, the fact that the pile driving location is below grade would likely reduce the amount of noise that propagates from the site as the surrounding berms would block some portion of the sound. Further, the substrate at the Port of Benton barge slip modification area is composed of gravels and silt fines down to bedrock. This type of substrate offers less resistance to pile driving, allowing more of the energy from the strike to go into placing the pile and less energy to be radiated out in the form of sound. If needed, less power could be applied to each strike, which would also lower the amount of noise from pile driving. However, doing so would result in longer pile driving times to complete. Additionally, according to the Municipal Code

Chapter 9.16, Nuisances, Section 9.16.050, Exceptions (C) of the City of Richland, construction occurring between the hours of 7:00 a.m. and 9:00 p.m. are exempt from the prohibitions of Municipal Code Chapter 9.16, Nuisances, Section 9.16.045 (Prohibitions). Therefore, while intrusive, it is not anticipated that pile driving during this working window would represent a notable degradation of the acoustic environment or increase in the Day-Night Levels in adjacent communities.

3.8.3.3.2 Road Modifications Between Port of Benton Barge Slip and Trench 94 at the Department of Energy Hanford Site

Improvements may be required at 11 locations (Figure 3.8-2) over the course of a year along the transport route to support dual reactor compartment packages potentially weighing 3,304 tons. Proposed improvements to the route include the following changes:

- cutting and/or filling to reduce the vertical curve
- filling dips in the road
- paving medians
- filling low sides and/or cutting high sides to reduce side slope
- filling road shoulders to improve transitions (intersections)

Construction would involve using diesel-powered heavy equipment for limited excavation, delivering materials, backfilling excavated areas, and paving the roadway. Temporary noise levels of 74–90 dBA at a distance of 50 ft. could be generated by earth-moving equipment (excavators, backhoes, pavement scarifiers, and trucks), based on data of typical noise ranges.

Most road modifications would occur along sections of roads far removed from any sensitive receptors. The closest road modification location (Location 1, Figure 3.8-2) is approximately 0.4 mi. north of the closest residential receptor and approximately 0.6 mi. from residential areas on the east side of the Columbia River. Under the worst-case scenario (the closest work site to sensitive receptors), the received sound level is estimated to be below 60 dBA. At these levels, it is not anticipated that road construction noise would represent a notable degradation of the acoustic environment or an increase in the Day-Night Levels in adjacent communities.

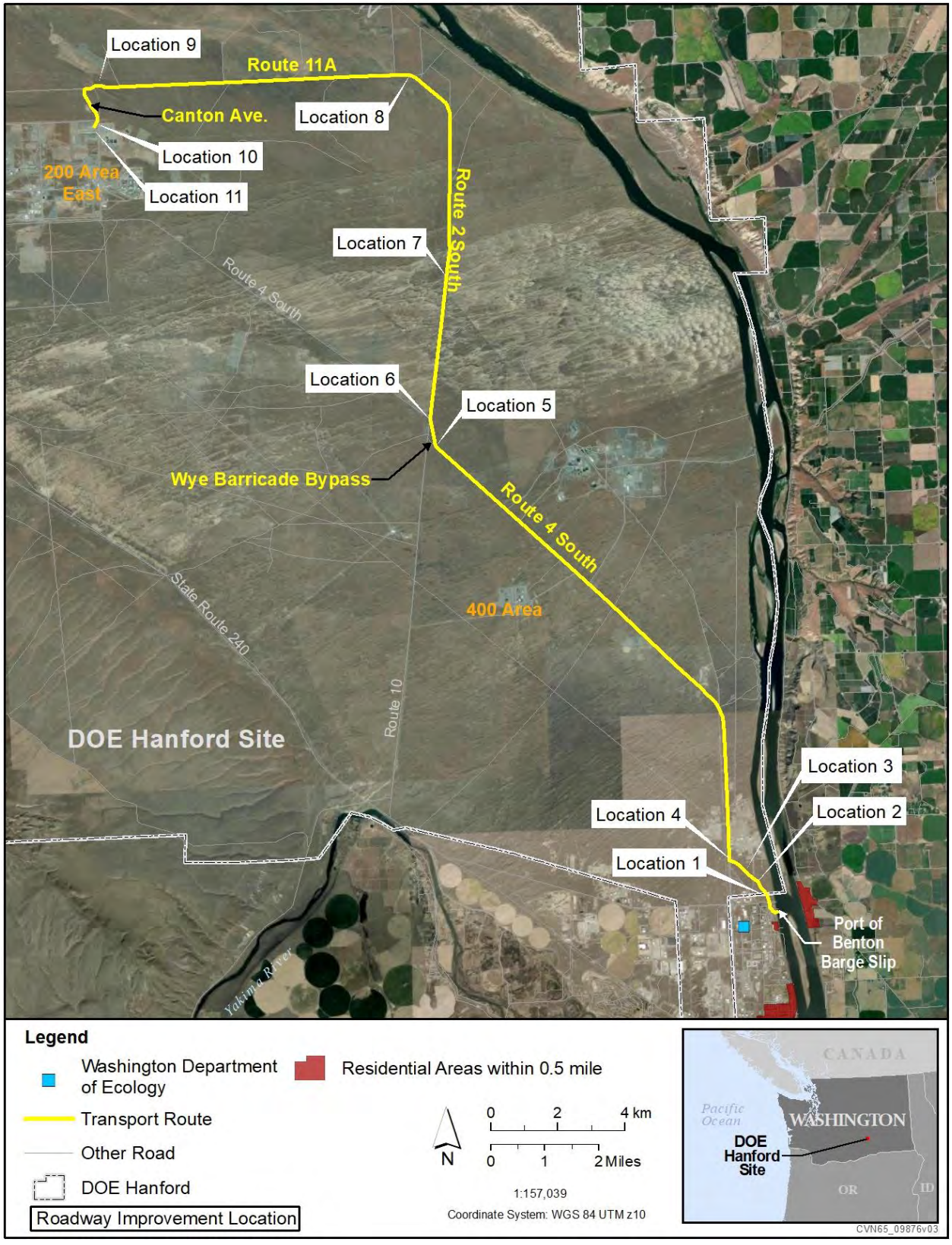


Figure 3.8-2: Locations of Proposed Improvements

3.8.3.4 Alternative 3 (Preferred Alternative): Commercial Dismantlement

Under Alternative 3 (Preferred Alternative) the entire ex-Enterprise would be dismantled at a commercial facility over approximately five years. The initial preparation and transport of ex-Enterprise from Newport News, Virginia, would be the same as the reactor compartment packaging alternatives.

The sections below detail potential noise impacts from dismantlement and disposal at a commercial dismantlement facility. Disposal of low-level radioactive at approved waste facilities is not discussed in detail due to standard operating plans/permits in place at the waste facilities and because the Proposed Action would not increase or alter current work conducted at these sites.

3.8.3.4.1 Complete Dismantlement of ex-Enterprise

Once at the dismantlement facility, the selected contractor would completely dismantle and recycle ex-Enterprise using established processes and techniques. The aircraft carrier dismantling contracts include a clause requiring compliance with all applicable federal, state, and local environmental and occupational safety and health laws and regulations. The Navy would place a contract to dismantle ex-Enterprise at a commercial facility, and the Navy envisions implementing the Nuclear Regulatory Commission (NRC) decommissioning process for radioactive material licensees described in the NRC Consolidated Decommissioning Guidance (NUREG-1757) with direct support from the NRC. Commercial dismantlement facilities in the proposed locations have performed ship dismantlement activities and currently perform ship dismantlement work, so no new noise-generating activities would occur at the facility. Noise impacts on surrounding communities are not anticipated to change.

3.8.3.4.2 Transport Waste and Recyclable Materials from Commercial Dismantlement Facility to an Approved Waste Disposal or Recycling Facility

For purposes of this EIS/OEIS, if all contaminated and clean waste and recyclable materials from the dismantlement operations are packaged in a 95-cubic yard CONEX box with a weight limit of 55,000 pounds (27.5 tons) per container, the 75,000-ton ex-Enterprise would generate more than 2,700 CONEX box shipments. The total number of shipments could exceed 3,000 when considering waste from materials used in the dismantlement process. Smaller containers would result in a greater number of shipments. If shipments are sent as soon as prepared, approximately two to three CONEX boxes would be shipped a day via truck.

In a typical hour, the traffic volume would need to double to increase the noise level by 3 dB. Under Alternative 3 (Preferred Alternative), there would be at least one CONEX box per truck, for a maximum number of 3,000 trucks. Trucks would not travel to the waste facility at the same time but rather as they are prepared and loaded at the dismantlement site over the course of approximately five years. The number of trucks prepared and loaded at the dismantlement site per day would not double the traffic volume, nor increase traffic such that average noise levels would notably increase.

If transport occurred via rail, CONEX boxes would be loaded onto trains as they are prepared and shipped along with other shipping containers along existing rail networks. As these networks experience several train transits per day, it is not anticipated that the shipment of CONEX boxes would add to train transit volume. Therefore, while noise from a passing train can be intrusive, the inclusion of additional cars to the train would only minimally increase community noise levels.

3.8.3.4.3 Transport Low-Level Radioactive Waste from Commercial Dismantlement Facility to Approved Wasted Disposal Facility

The eight reactor plants would be broken down and placed into approximately 440 CONEX boxes for shipment over the course of two to three years. Transport from the dismantlement facility to the disposal site could occur by barge, truck, or rail. Barge transport would be similar to routine towing activities described under initial transport, and typically would occur at distances from shore (approximately 0.25–0.5 mi.) and sensitive receptors where noise would not change the acoustic environment. If shipment of the 440 CONEX boxes occurred via truck, the increase on roadways would be minimal and the number of trucks prepared and loaded at the dismantlement site per day would not double the traffic volume, nor increase traffic such that average noise levels would notably increase.

Alternative 3 (Preferred Alternative) would include transport and dismantlement activities that have occurred in the past with little to no noise impacts. Additionally, methodologies and compliance with applicable federal, state, and local environmental and occupational safety and health laws and regulations would continue under Alternative 3 (Preferred Alternative). Therefore, because of the historical lack of noise impacts from transportation and no new activities proposed, Alternative 3 (Preferred Alternative) is not anticipated to cause noise-generating activities that would degrade the acoustic environment or increase the Day-Night Levels.

3.8.4 Mitigation

All proposed activities would comply with all applicable federal, state, and local environmental and occupational safety and health laws and regulations. Additionally, under Alternative 2, construction activities near the Port of Benton barge slip would be conducted between the hours of 7:00 a.m. and 9:00 p.m. to comply with the Municipal Code Chapter 9.16, Nuisances, Section 9.16.045, Prohibition (9) of the City of Richland.

No mitigation measures are required under any of the alternatives, including the No Action Alternative, to mitigate noise impacts because no impacts on community noise levels are reasonably foreseeable. If reasonably foreseeable impacts are determined to result, mitigation measures would be developed and implemented. For example, if impacts from pile driving strikes at the Port of Benton barge slip under Alternative 2 are noted at sensitive receptor locations, these intermittent impacts can be reduced by requiring the pile driving activities to use less energy per blow, but that would then use more blows to drive the pile. In this manner, the amount of noise per strike would be reduced. Also under Alternative 2, the Navy would notify the Environmental Molecular Sciences Laboratory (approximately 0.7 mi southwest of the barge slip) and the Laser Interferometer Gravitational-Wave Observatory (approximately 1.5 mi. southwest of the Wye Barricade Bypass) of pile-driving and construction activities to ensure those activities do not interfere with data collection at either facility.

3.8.5 Summary of Impacts and Conclusions

Table 3.8-2 summarizes the potential impacts of the Proposed Action and Alternatives on sensitive receptors.

Table 3.8-2: Summary of Impacts and Conclusions on Noise Environment

Potential Impacts from Noise	Alternatives			
	No Action	1	2	3
Impacts to sensitive receptors			◑	
Change to community noise levels (Day-Night Levels)			○	

Notes: ◑ = Some impact but reduced as a result of project design changes, implementation of current or proposed best management practices, monitoring, or mitigation; ○ = minimal impact; Blank = no impact/not applicable

3.9 Summary of Potential Impacts on Resources and Impact Avoidance and Minimization

This section describes the potential impacts and proposed mitigation measures that the United States (U.S.) Department of the Navy (Navy) would implement to avoid or reduce potential impacts from the disposal of the decommissioned, defueled ex-Enterprise aircraft carrier, including its reactor plants. As a cooperating agency for the Proposed Action and alternatives, the Department of Energy would implement applicable mitigation measures developed by the Navy for the Proposed Action and alternatives, including the No Action Alternative.

The Navy would also implement existing best management practices and standard operating procedures specific to each resource area under the Proposed Action and alternatives as discussed in Sections 3.1 (Public and Occupational Health and Safety) through 3.8 (Noise). In many cases, existing best management practices provide a benefit to environmental, human, and cultural resources. Existing best management practices differ from mitigation measures because they are designed to provide for safety and mission success, whereas mitigation measures are designed specifically to avoid or reduce potential environmental impacts. An example of an existing best management practice is the Navy avoiding known navigation hazards that appear on navigational charts, such as submerged wrecks and obstructions, during water travel. As a standard collision avoidance procedure, watch personnel also monitor for marine mammals that have the potential to be in the direct path of the ship. In addition to the proposed mitigation measures and existing best management practices specific to the Proposed Action and alternatives, the Navy has existing routine operating instructions (e.g., training manuals) and local installation instructions (e.g., Integrated Natural Resource Management Plans) that were developed to meet other safety and environmental compliance requirements or initiatives. The Navy would continue complying with applicable operating instructions and local installation instructions within the Study Area, as appropriate.

National Environmental Policy Act regulations require that an Environmental Impact Statement include discussion of measures where required as a means to mitigate adverse environmental impacts. The intention of mitigation is to reduce the adverse effects of an action on the environment. Council on Environmental Quality regulations (40 Code of Federal Regulations Section 1508.20) identify the following five ways to reduce or mitigate the severity or intensity of adverse impacts:

- avoiding the impact altogether
- minimizing impacts
- rectifying the impact by repairing, rehabilitating, or restoring the affected environment
- reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- compensating for the impact by replacing or providing substitute resources or environments

This section provides summaries of impacts and lists potential mitigation measures that are proposed to reduce impacts associated with the Proposed Action and alternatives (Table 3.9-1). Potential mitigation measures generally aim to reduce impacts from disposal of the decommissioned, defueled ex-Enterprise aircraft carrier including its reactor plants to the human, cultural, and biological environment and are presented as applicable.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.1 **Public and Occupational Health and Safety**	**No Action Alternative:** • The impacts of the No Action Alternative on public and occupational health and safety would be minimal. **Alternative 1:** • Occupational safety and health impacts from maritime transportation would be minimal. • The radiation dose to the public from the transportation of radioactive wastes is estimated to be minor and considerably below the average background levels of radiation. Therefore, radiological impacts from the tow of ex-Enterprise are expected to be negligible. • Shipment of the propulsion space section would result in an insignificant radiation dose to crew members and members of the public. • While shipyard work and marine transport carry occupational risks that are higher than other occupations, the impacts of Alternative 1 on worker health and safety would be minimal. • The Navy estimates that the collective dose for all workers to prepare the eight Ex-Enterprise reactor compartment package under Alternative 1 would be 300 Roentgen equivalent man (rem). The dose per worker would remain below regulatory limits. As such, impacts of radiation exposure on public health and safety would be minimal. • The construction of the concrete rail support system at Trench 94 at the Department of Energy (DOE) Hanford Site would be conducted in accordance with applicable DOE Orders and procedures regarding construction and occupational and public safety. As such, impacts on public health and safety would be minimal. • Radiation levels on the exterior of the reactor compartment packages for transport are expected to be negligible and shipment would result in an insignificant radiation dose to crew members and members of the public. **Alternative 2:** • Public and occupational health and safety impacts for Alternative 2 would be similar to Alternative 1.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.1 **Public and Occupational Health and Safety (continued)**	• The occupational dose for Alternative 2 would be lower than Alternative 1 as there would be less radiological work associated with constructing the dual reactor compartment packages. • Port of Benton barge slip modification and road improvement work would be conducted in accordance with applicable federal and state regulations regarding occupational health and safety and protection of the public. As such, impacts on public and occupational health and safety would be minimal. **Alternative 3 (Preferred Alternative):** • While shipyard work and marine transport carry occupational risks that are higher than other occupations, the impacts of Alternative 3 (Preferred Alternative) on worker health and safety would be minimal. • The radiation dose to the public from the transportation of radioactive wastes is estimated to be minor and considerably below the average background levels of radiation. Therefore, radiological impacts from the tow of ex-Enterprise and shipping waste from the commercial dismantlement facility are expected to be negligible. • The Navy estimates that the collective dose for all workers under Alternative 3 (Preferred Alternative) would be 540 rem over three years. The dose per worker would remain below regulatory limits. As such, impacts of radiation exposure on public health and safety would be minimal. • Regardless of the location used for Alternative 3 (Preferred Alternative), the impacts of Alternative 3 (Preferred Alternative) on public health and safety within the location-specific Region of Influence (ROI) would be considered minimal. The work described at commercial dismantlement facilities analyzed in this National Environmental Policy Act document is similar to work already conducted by industries at these locations and would use established processes and regulations. These activities have been analyzed previously under the *Final Environmental Assessment Decommissioning and Dismantling of STURGIS and MH-1A* (USACE, 2014). **Mitigation:** • There are no mitigation measures beyond those required by federal, state, and local laws under any of the alternatives, including the No Action Alternative. Mitigation measures are not required for resource areas where there is minimal impact from the Proposed Action.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.2 **Hazardous and Radioactive Waste Management**	**No Action Alternative:** • Periodic maintenance and inspections would be performed to ensure that the ship is maintained in a safe and environmentally responsible manner. Access to the ship would be controlled to limit exposure to hazardous and radioactive materials to trained personnel involved in maintaining the ship. **Alternative 1:** • Work under Alternative 1 would include hazardous and radioactive materials and wastes, including low-level radioactive waste (LLRW). The impacts from managing these materials and wastes would be minimal. • Partial dismantlement of ex-Enterprise at a commercial dismantlement facility would generate 5,522 tons of hazardous waste (see Table 3.2-1). Management and disposal of these hazardous wastes would result in minimal impacts on the environment. • Non-radioactive and non-hazardous materials would be transported and recycled or disposed of at regional facilities in accordance with applicable local, state, and federal laws. • Hazardous and radioactive material and waste management operations from dismantlement of the propulsion space section would be consistent with ongoing and regulated practices described in the Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) Waste Management Procedures and state and federal waste regulations. These waste disposal operations would not strain the existing capacity of available disposal sites. • Reactor compartment package barge transit from PSNS & IMF to Port of Benton barge slip, land transportation from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site, and installation of rail system in Trench 94 at the DOE Hanford Site would require the use of hydraulic fluids, oils, and fuels. These materials would be managed and disposed of using applicable regulations, site procedures, and best management practices, resulting in minimal impacts. **Alternative 2:** • Work under Alternative 2 would include hazardous and radioactive materials and wastes, including LLRW. The impacts from managing these materials and wastes would be minimal.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.2 **Hazardous and Radioactive Waste Management (continued)**	• Impacts of hazardous and radioactive materials and wastes under Alternative 2 include all impacts described under Alternative 1. • Activities associated with construction at the Port of Benton barge slip or during road improvements could generate small volumes of hazardous wastes in the form of spilled fuel, hydraulic fluids, or lubricant from construction equipment. Any hazardous wastes generated as a result of these activities would be managed in accordance with applicable regulations and policies resulting in minimal impacts. **Alternative 3 (Preferred Alternative):** • The management of additional hazardous material and hazardous waste encountered throughout the ship would be consistent with ongoing and regulated practices at the commercial dismantlement locations and result in minimal impacts on the environment. • LLRW operations and disposal would result in minimal impacts on the environment. **Mitigation:** No mitigation measures would be necessary under any of the alternatives, including the No Action Alternative, as analysis concluded that the public and occupational health and safety impacts would be considered minimal.
Section 3.3 **American Indian Tribal Resources and Tribal Rights**	**No Action Alternative:** • Long-term storage is consistent with past and current uses and would have no impacts associated with American Indian protected tribal resources and tribal rights. **Alternative 1:** • Transit would occur within established shipping lanes and would not impede access to usual and accustomed (U&A) fishing grounds. Bottom scour during docking at PSNS & IMF would not occur. • Transit, pier-side work, barge transport, and land transport activities would have minimal impacts on biological resources and water quality with the use of best management practices.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.3 **American Indian Tribal Resources and Tribal Rights (continued)**	• Installation of additional rail structures in Trench 94 at the DOE Hanford Site would not change the use of Trench 94 and Trench 94 is not a location currently used for tribal resource gathering. • Alternative 1 would have minimal impacts on American Indian protected tribal resources and tribal rights. **Alternative 2:** • Impacts on American Indian protected tribal resources and tribal rights under Alternative 2 include all impacts described under Alternative 1. • In-water construction activities for the Port of Benton barge slip modification would have some impacts on biological resources, but these would be reduced through the use of protective measures. These activities may impede access to U&A fishing grounds temporarily while construction is underway, and fish may be more difficult for tribal fishers to catch. • Best management practices during construction activities would be designed to ensure minimal impacts on culturally significant fish species. There would be a temporary adverse effect during construction, with no adverse effect long term and the potential to improve salmonid rearing habitat long term. • Some potential impacts on culturally significant vegetation associated with road improvement actions within a tribal sacred site (Preservation Designated Area at the DOE Pacific Northwest National Laboratory site) under Alternative 2 would be reduced through the use of protective measures (such as restricting vehicle use to the current borders of the haul road) and based on consultation with affected tribes. • Alternative 2 would have more potential impacts than Alternative 1 because of the Port of Benton barge slip modification and road improvements at the DOE Pacific Northwest National Laboratory site, with some impacts on American Indian protected tribal resources and tribal rights; these would be reduced through use of proposed management practices. **Alternative 3 (Preferred Alternative):** Alternative 3 (Preferred Alternative) would not impact American Indian protected tribal resources and tribal rights because recycling and disposal are routine operations and the Navy's outreach and research efforts have not identified protected tribal resources and tribal rights concerns at the commercial dismantlement or waste disposal facilities.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.3 **American Indian Tribal Resources and Tribal Rights (continued)**	**Mitigation:** All activities would comply with all applicable federal, state, and local environmental and occupational safety and health laws and regulations. If reasonably foreseeable impacts are determined to result, mitigation measures beyond best management practices would be developed and implemented. No mitigation measures are required under any of the alternatives, including the No Action Alternative, because no major impacts requiring mitigation are reasonably foreseeable on tribal-reserved rights and protected tribal resources.
Section 3.4 **Socioeconomics and Environmental Justice**	**No Action Alternative:** • Long-term storage of ex-Enterprise is not likely to measurably improve or impact the human, economic, or environmental condition of the ROI, and no disproportionate impacts are anticipated on environmental justice populations as a result of the No Action Alternative. **Alternative 1:** • Impacts from towing operations would be minimized as a result of adherence to existing best management practices, including compliance with the Navy Towing Manual SI740-AA-MAM-010, Rev 3, July 2002. Additionally, towing operations would occur in open ocean or rivers, which would not come in contact with low income or minority populations, impact the local economy or housing, or result in a change in population in the ROI. • With adherence to applicable regulations and use of existing transport systems, there would not be a disproportionate impact on environmental justice populations and impacts on socioeconomic resources from waste transport activities would be minimal. • Impacts on the local economies would be minimal. • Additional workers are not needed at PSNS & IMF to conduct activities associated with Alternative 1, so no impact on housing in the Washington ROI is anticipated.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.4 **Socioeconomics and Environmental Justice (continued)**	**Alternative 2:** • Impacts on socioeconomics and environmental justice populations under Alternative 2 include all impacts described under Alternative 1. • Construction at the Port of Benton barge slip and the transport route at the DOE Hanford Site would result in temporary work and could be accomplished by the existing workforce. Impacts associated with construction on socioeconomic resources are anticipated to be minimal, and no disproportionate impacts on environmental justice populations would occur. **Alternative 3 (Preferred Alternative):** • Impacts from towing operations would be minimized as a result of adherence to existing best management practices, including compliance with the Navy Towing Manual SI740-AA-MAM-010, Rev 3, July 2002 Additionally, towing operations would occur in open ocean or rivers, which would not come in contact with low income or minority populations, impact the local economy or housing, or result in a change in population in the ROI. • The addition of the workers to the Virginia, Texas, or Alabama ROI would indirectly have a small benefit to the local economy, through the temporary increase of approximately 94 workers to the Virginia, Texas, or Alabama ROI for a period of three to five years. The additional workers would result in less than 0.01 percent increase to the population, and impacts on the population, economy, and housing markets, would be negligible. • Although there are environmental justice populations in the Alternative 3 (Preferred Alternative) ROIs, impacts associated with the dismantlement and disposal of ex-Enterprise are anticipated to be minimal with risks consistent with ongoing work in the areas. Therefore, no disproportionate impacts on environmental justice populations would occur. **Mitigation:** • All activities would comply with all applicable federal, state, and local environmental and occupational safety and health laws and regulations. No mitigation measures are required under any of the alternatives, including the No Action Alternative, because no major impacts are reasonably foreseeable.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.5 **Biological Resources**	**No Action Alternative:** • Under the No Action Alternative, there would be no stressors on biological resources. Dry dock maintenance avoids potential impacts on the in-water environment of the James River, including adult Atlantic sturgeon during spawning migrations up the James River (and designated critical habitat) and the seasonal occurrence of sea turtles within the Chesapeake Bay. **All Action Alternatives:** • In-water hull cleaning of ex-Enterprise may be required in accordance with previous agreements between the Navy and National Marine Fisheries Service (NMFS) (NMFS, 2019). • In-water hull cleaning would be in accordance with Uniform National Discharge Standards (85 FR 43465). Endangered Species Act (ESA) and Essential Fish Habitat (EFH) impacts are anticipated to be localized and temporary, with standard operating procedures further minimizing potential impacts. The Navy has determined that in-water hull cleaning may affect Atlantic sturgeon, Atlantic sturgeon critical habitat, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle. In-water hull cleaning would have no effect on the shortnose sturgeon. • Ship and tow line strike and ship noise could potentially impact offshore and pelagic (open-ocean) marine organisms such as marine mammals, fishes, sea turtles, or marine birds along the tow route of the ex-Enterprise; however, the likelihood of such an encounter is extremely remote because of the low probability that a large marine organism would overlap this single towing event. The NMFS 2019 Programmatic Biological Opinion (NMFS, 2019)(NMFS, 2019) determined that ship and towline strike and ship noise may affect ESA listed species in open waters; however, these impacts are discountable (strike is extremely unlikely to occur) and insignificant (ship noise would have no measurable effect).

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.5 **Biological Resources (continued)**	o If the Navy selects a commercial dismantlement facility within the Hampton Roads Metropolitan Area, Virginia, towing ex-Enterprise from its current mooring location may affect shortnose sturgeon, Atlantic sturgeon, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle. o If the Navy selects a commercial dismantlement facility at the Port of Mobile, towing ex-Enterprise through Mobile Bay may affect the Gulf sturgeon, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, and the West Indian manatee. Towing of ex-Enterprise through Mobile Bay would have no effect on the Alabama sturgeon or red-bellied turtle. o If the Navy selects a commercial dismantlement facility at the Port of Brownsville, towing may affect the green sea turtle. These impacts were analyzed under the NMFS 2019 Programmatic Biological Opinion (NMFS, 2019). **Alternative 1:** • Impacts on biological resources under Alternative 1 include all impacts described under All Action Alternatives. • Heavy-lift ship transport of the propulsion space section to PSNS & IMF and barge transport of the reactor compartment packages would have negligible impacts on biological resources. The heavy-lift ship and barge speeds would generally be slower than other ships that travel at speeds known to present significant strike risks to marine mammals and sea turtles, and heavy-lift ship transit and barge transport are considered normal maritime activities. Alternative 1 would have one heavy-lift ship transport and eight barge transits. **Alternative 2:** • Impacts on biological resources under Alternative 2 include all impacts described under All Action Alternatives. • Alternative 2 would have one heavy-lift ship transport and four barge transits.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.5 Biological Resources (continued)	• In-water construction activities during the Port of Benton barge slip modification would introduce water and sediment quality stressors. These stressors would have minimal impacts on biological resources based on the protective measures to contain turbidity and to reduce the likelihood of chemical contamination into the Columbia River. o Construction activities would disturb sediments and temporarily suspend solids in the river channel used by ESA-listed salmonid species; therefore, the Navy has determined that the Proposed Action may affect the Chinook salmon (Upper Columbia River Spring-Run Evolutionarily Significant Unit [ESU]), steelhead (Upper Columbia River Distinct Population Segment [DPS] and Middle Columbia River DPS), and bull trout (Columbia River DPS). In-water construction activities would occur in designated critical habitat for Chinook salmon (Upper Columbia River Spring-Run ESU), steelhead (Upper Columbia River DPS and Middle Columbia River DPS), and bull trout (Columbia River DPS). The Navy has determined that the Proposed Action may affect designated critical habitat. Under Alternative 2, there are a number of measures that would minimize or avoid potential impacts on ESA-listed salmonids. These measures include conducting in-water work within an in-water work window that reduces potential impacts and the creation of additional favorable salmonid river bottom habitat following the removal of the south jetty. The Navy also determined that construction activities at the Port of Benton under Alternative 2 may adversely affect EFH; however, the potential impacts would be temporary and short-term. • Noise generated by construction activities at the Port of Benton barge slip would have minimal impacts on biological resources. o Construction noise under Alternative 2 may affect the Chinook salmon (Upper Columbia River Spring-Run ESU), steelhead (Upper Columbia River DPS and Middle Columbia River DPS), and bull trout (Columbia River DPS). Construction would occur during the winter in-water work window when salmonids are not migrating; therefore salmonids, if any, would be expected to occur in only very low numbers. Potential adverse effects resulting from construction activities would be discountable (unlikely to occur) and insignificant (not measurable). The Navy also determined that construction noise may adversely affect EFH; however, the potential impacts are expected to be very minor in severity, short term in duration, and limited in spatial extent.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
	• Potential impacts on biological resources associated with road improvement actions under Alternative 2 would have minimal impacts on biological resources and would have no effect on ESA-listed species.
Section 3.5 **Biological Resources (continued)**	**Alternative 3 (Preferred Alternative):** • Impacts on biological resources under Alternative 3 include all impacts described under All Action Alternatives. • Pursuant to section 7 of the ESA, the Navy consulted on the Preferred Alternative with NMFS and the U.S. Fish and Wildlife Service (USFWS) to determine the effect of the hull cleaning on species in Virginia, as discussed above. Additionally, in accordance with the Magnuson–Stevens Fishery Conservation and Management Act, the Navy consulted on the Preferred Alternative with NMFS to determine the effect of the hull cleaning on EFH in Virginia as discussed above. The Navy does not anticipate adverse effects at this time, and both NMFS and USFWS concur with this conclusion (Appendix D [Consultation Correspondence]). • The Navy consulted with NMFS and USFWS to determine the effect of the ship strike and tow and ship noise on species in Virginia and Alabama, as discussed above. The Navy does not anticipate adverse effects at this time, and both NMFS and USFWS concur with this conclusion (Appendix D [Consultation Correspondence]). **Mitigation:** • If the Navy selects any of the action alternatives (Alternatives 1, 2, or 3 [Preferred Alternative]), hull cleaning of ex-Enterprise would be required for the initial transport of ex-Enterprise to commercial dismantlement facilities outside of the Hampton Roads Metropolitan Area, Virginia. The Navy would implement this measure to reduce the potential for non-indigenous aquatic organisms to be introduced to the Port of Mobile or the Port of Brownsville. Hull cleaning would potentially impact water and sediment quality at the current mooring location at Newport News Shipbuilding, Virginia. Potential impacts of hull cleaning are analyzed under each alternative in Section 3.5.3 (Environmental Consequences). • If the Navy selects Alternative 2, the Navy would include habitat improvement measures at the Port of Benton barge slip modification area within the Columbia River channel for the benefit of juvenile salmonids. The Navy would replace the south jetty with favorable gravel substrate. The expectation is to improve habitat for migrating juvenile salmon. The project would add approximately 7,000 square feet of benthic food production and enhance instream habitat availability.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.6 **Air Quality**	**<u>No Action Alternative</u>:** • No significant air impacts. **<u>Alternative 1</u>:** • Towing of ex-Enterprise would result in a minimal and temporary increase of marine ship emissions. • Ship recycling and ship dismantling activities would comply with applicable rules and regulations and would not significantly impact air quality. • Air emissions from shipping of the propulsion space section with heavy-lift ship are expected to be well below de minimis levels. • Reactor compartment package preparation would not be expected to result in a significant degradation of air quality. • Air emissions from the transport of the reactor compartment packages are expected to be below de minimis levels. **<u>Alternative 2</u>:** • Impacts on air quality under Alternative 2 include all impacts described under Alternative 1. • Temporary air quality impacts are expected from the Port of Benton barge slip modifications and road improvements, but overall emissions would remain below *de minimis* levels. **<u>Alternative 3 (Preferred Alternative)</u>:** • Towing ex-Enterprise would result in a minimal and temporary increase of marine ship emissions. • Ship recycling and ship dismantling activities would comply with applicable rules and regulations and would not significantly impact air quality.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.6 **Air Quality (continued)**	**Mitigation:** All activities would comply with all applicable federal, state, and local environmental and occupational safety and health laws and regulations. If reasonably foreseeable impacts are determined to result, mitigation measures beyond best management practices would be developed and implemented. No mitigation measures are required under any of the alternatives, including the No Action Alternative, because no impacts are reasonably foreseeable.
Section 3.7 **Cultural Resources**	**No Action Alternative:** • No impacts to cultural resources are expected to occur under the No Action Alternative. **Alternative 1:** • No impacts on cultural resources are expected to occur for the land transport of reactor compartment packages from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site under Alternative 1. • No impacts to cultural resources are expected to occur for the limited excavation required for the installation of rail system in Trench 94 at the DOE Hanford Site. **Alternative 2:** • Impacts on cultural resources for the land transportation from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site outside of the improvement areas and installation of rail system in Trench 94 at the DOE Hanford Site would be similar to Alternative 1. • The barge slip modifications have the potential to impact cultural resources if the barge slip was to be determined to be eligible for listing in the National Register of Historic Places. • Improvements on the transport route from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site could have potential impacts on the Preservation Designated Area and identified Traditional Cultural Properties.

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
Section 3.7 **Cultural Resources (continued)**	• Improvements to the transport route at Locations 2, 7, 8, and 9 could have potential impacts on known cultural resources, and impacts on unknown subsurface archaeological deposits may occur where proposed transport route improvements may involve cut or excavation activities at Locations 3, 4, 6, 9, and 11, or by the placement of fill material at Locations 1, 2, 4, 5, 8, 10, and 11. **Alternative 3 (Preferred Alternative):** • No impacts to cultural resources are expected to occur under Alternative 3 (Preferred Alternative). **Mitigation:** All ex-Enterprise disposal activities related to the Proposed Action and alternatives would comply with all applicable federal, state, and local environmental and occupational safety and health laws and regulations, and existing cultural resources management plans. • While ex-Enterprise is eligible for listing in the National Register of Historic Places, when the Navy fulfills the remaining requirements of the Program Comment upon designating final disposition, the Navy will have met its responsibilities under Section 106 of the National Historic Preservation Act to take into account the effect of the Proposed Action on the National Register of Historic Places-eligible ex-Enterprise, and no further mitigation is required. No impacts on cultural resources are reasonably foreseeable under the No Action Alternative, Alternative 1, or Alternative 3 (Preferred Alternative) and no mitigation measures are required. • Under Alternative 2, the Port of Benton barge slip would be evaluated for eligibility for the National Register of Historic Places because it was completed late in the year 1972. If it is eligible, the Navy would implement measures to avoid, minimize, and/or mitigate adverse effects consistent with the results of a National Historic Preservation Act Section 106 review. • Under Alternative 2, known cultural resource locations would be avoided during design of the transport route improvements at Locations 2, 7, 8, and 9 and a qualified archaeological monitor meeting Secretary of the Interior Professional Qualifications Standards, as promulgated in 36 Code of Federal Regulations Part 61 would be present

Table 3.9-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Preferred Alternative) (continued)

Resource Category	Summary of Impacts and Potential Mitigation Measures
	during all improvement activities at the proposed transport route improvement locations to minimize potential impacts. Additional mitigation measures identified at the time of the Record of Decision will be described as appropriate in that document if Alternative 2 is selected.
Section 3.8 **Noise**	**No Action Alternative:** • The No Action Alternative is not anticipated to cause noise-generating activities that would degrade community noise levels (Day-Night Levels). **Alternative 1:** • Alternative 1 is not anticipated to cause noise-generating activities that would degrade community noise levels (Day-Night Levels). **Alternative 2:** • Alternative 2 is anticipated to cause noise-generating activities (e.g., pile driving), which would only minimally increase community noise levels (Day-Night Levels). **Alternative 3 (Preferred Alternative):** • Alternative 3 (Preferred Alternative) is not anticipated to cause noise-generating activities that would degrade community noise levels (Day-Night Levels). **Mitigation:** • No mitigation measures are required under any of the alternatives, including the No Action Alternative, to mitigate noise impacts because no impacts on community noise levels (Day-Night Levels) are reasonably foreseeable. If reasonably foreseeable impacts are determined to result, mitigation measures would be developed and implemented.

Note: USACE = U.S. Army Corps of Engineers

4 CUMULATIVE IMPACTS

This chapter provides information on the cumulative impacts analyzed in this Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS).

4.1 Principles of Cumulative Impacts Analysis

The approach taken herein to analyze cumulative impacts meets the objectives of the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) regulations, and CEQ guidance. CEQ regulations (40 Code of Federal Regulations Parts 1500-1508) provide the implementing procedures for NEPA. The regulations define "cumulative effects" as:

> *…the impact on the environment which results from the incremental impact 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 Code of Federal Regulations 1508.7).*

The CEQ provides guidance on cumulative impacts analysis in the *Council on Environmental Quality's Considering Cumulative Effects Under the NEPA* (CEQ, 1997). This guidance further identifies cumulative effects as those environmental effects resulting "from spatial and temporal crowding of environmental perturbations. The effects of human activities will accumulate when a second perturbation occurs at a site before the ecosystem can fully rebound from the effects of the first perturbation." Noting that environmental impacts result from a diversity of sources and processes, this CEQ guidance observes that "no universally accepted framework for cumulative effects analysis exists," while also noting that certain general principles have gained acceptance. One such principle provides that "cumulative effects analysis should be conducted within the context of resource, ecosystem, and community thresholds—levels of stress beyond which the desired condition degrades." Thus, "each resource, ecosystem, and human community must be analyzed in terms of its ability to accommodate additional effects, based on its own time and space parameters." Therefore, cumulative effects analysis normally will encompass a Region of Influence (ROI) or geographic boundaries beyond the immediate area of the Proposed Action, and a timeframe including past actions and foreseeable future actions, to capture these additional effects. Bounding the cumulative effects analysis is a complex undertaking, appropriately limited by practical considerations. Thus, CEQ guidelines observe that it "is not practical to analyze cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful."

4.1.1 Determination of Significance

Per CEQ Guidance (CEQ, 1997), the "levels of acceptable change used to determine the significance of effects will vary depending on the type of resource being analyzed, the condition of the resource, and the importance of the resource as an issue." Furthermore, "this change is evaluated in terms of both the total threshold beyond which the resource degrades to unacceptable levels and the incremental contribution of the Proposed Action to reaching that threshold." In practice, "the analyst must determine the realistic potential for the resource to sustain itself in the future and whether the Proposed Action will affect this potential." In other words, for a Proposed Action to have a cumulatively significant impact on an environmental resource, two conditions must be met. First, the combined effects of all identified past, present, and reasonably foreseeable projects, activities, and processes on a resource, including the effects of the Proposed Action, must be significant. Second, the Proposed Action must make a measurable or meaningful contribution to that significant cumulative impact.

4.1.2 Identifying Region of Influence or Geographical Boundaries for Cumulative Impacts Analysis

The ROI or geographic boundaries for analyses of cumulative impacts can vary for different resources and environmental media. CEQ guidance (1997) indicates that geographic boundaries for cumulative impacts almost always should be expanded beyond those for the project-specific analyses. This guidance continues, indicating that one way to evaluate geographic boundaries is to consider the distance an effect can travel, and it identifies potential cumulative assessment boundaries accordingly. For air quality, the potentially affected air quality regions are generally the appropriate boundaries for assessment of cumulative impacts from releases of pollutants into the atmosphere; however, greenhouse gases impact the entire atmosphere. For water resources and land-based effects, watershed boundaries may be the appropriate regional boundary. For wide-ranging or migratory wildlife, specifically marine mammals, fish, turtles, and sea birds, any impacts of the Proposed Action might combine with the impacts of other activities or processes within the range of the population.

A ROI for evaluating the cumulative impacts of the Proposed Action is defined for each resource in Section 4.3 (Resource-Specific Cumulative Impact Analysis). The basic ROI or geographic boundary for the majority of resources analyzed for cumulative impacts in this EIS/OEIS is each portion of the Study Area (see Figures 2-1, 2-2, 2-4 through 2-8, 2-12, and 2-15 through 2-19). However, the geographic boundaries for cumulative impacts analysis for some resources are expanded to include activities outside of the Study Area that might impact migratory or wide-ranging animals. Other activities potentially originating from outside the Study Area that are considered in this analysis include impacts associated with maritime traffic (e.g., ship strikes and underwater noise) and commercial fishing (e.g., bycatch and entanglement).

4.2 Projects and Other Activities Analyzed for Cumulative Impacts

Cumulative analysis includes consideration of past, present, and reasonably foreseeable future actions. For past actions, the cumulative impacts analysis only considers those actions or activities that have had ongoing impacts that may be additive to impacts of the Proposed Action. Likewise, present and reasonably foreseeable future actions selected for inclusion in the analysis are those that may have effects additive to the effects of the Proposed Action as experienced by specific environmental receptors.

The cumulative impacts analysis makes use of the best available data, quantifying impacts where possible and relying on qualitative description and best professional judgement where detailed measurement is unavailable. Because specific information and data on past projects and actions are typically scarce, the analysis of past effects is often qualitative (CEQ, 1997). Likewise, analysis for ongoing actions is often inconsistent or unavailable. All likely future development or use of the region is considered to the greatest extent possible, even when a foreseeable future action is not planned in sufficient detail to permit complete analysis (CEQ, 1997).

The cumulative impacts analysis is bounded by the length of the Proposed Action, which would be a maximum of nine-and-a-half years under Alternative 1, six-and-a-half years under Alternative 2, and five years under Alternative 3 (Preferred Alternative). After dismantlement is complete, and the disposal of low-level radioactive waste (LLRW) is complete, impacts from the project would no longer contribute to cumulative impacts on the environment. As discussed in Section 3.2.1.2.1.1 (Federal Radioactive Waste Regulations), ex-Enterprise reactor compartment packages would have the same or better 600 to 2,000-year containment life as previous reactor compartment packages disposed of at Trench 94. The reactor vessels inside the compartments would provide an additional containment life into the tens of

thousands of years at Trench 94. In 2012, the United States (U.S.) Department of the Navy (Navy) prepared the *Final Environmental Assessment on the Disposal of Decommissioned, Defueled Naval Reactor Plants from USS Enterprise (CVN 65)*, which provides additional details. For commercial dismantlement, the reactor vessel may provide a similar containment life under corrosion inhibiting conditions and, in any case, would exceed the 500-year containment life assumed for Class C waste disposed of under Nuclear Regulatory Commission license (Navy & DOE, 2012).

Table 4-1 describes federal, state, and commercial actions that have had, continue to have, or could be expected to have some impact upon resources also impacted by the Proposed Action within the Study Area and surrounding areas. These activities are selected based on information obtained during the scoping process, communications with other agencies, a review of other military activities, literature review, previous NEPA analyses, and other available information. For a perspective of the general project locations, such as sites where Naval or commercial dismantlement could occur and disposal sites, please refer to Figures 2-1, 2-2, 2-4 through 2-8, 2-12, and 2-15 through 2-19, which depict the Study Area and boundaries of individual Naval and commercial dismantlement and disposal sites.

Table 4-1: Actions and Other Environmental Considerations Identified for the Cumulative Impacts Analysis

Project	Location	Project Description	Project Timeframe		
			Past	Present	Future
Washington – Kitsap County					
Environmental Impact Statement (EIS) for Bremerton Waterfront Infrastructure Improvements at Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF)	PSNS & IMF	The Navy is currently evaluating multiple alternatives for Bremerton waterfront infrastructure improvements at PSNS & IMF to address critical deficiencies in dry dock capacity, capability, and survivability. This action could occur at some point before, during, or after execution of ex-Enterprise disposal. These efforts will be analyzed in a separate document under the National Environmental Policy Act (NEPA). These infrastructure improvements would occur independent of the location or method of ex-Enterprise disposal, and these improvements would not be analyzed as a consequence of ex-Enterprise disposal work. Disposal of ex-Enterprise does not force or shape the alternatives for Bremerton waterfront improvements being considered. This project could have cumulative effects on all resource categories.		X	X
Conducting Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Five-Year Review	PSNS & IMF	Under CERCLA the Navy must conduct 5-year reviews at the site of PSNS & IMF, among other eligible sites, due to remedial actions occurring at the site and resulting in hazardous substances, pollutants, or contaminants remaining at levels that do not allow for unlimited use and unrestricted exposure. To complete a 5-year review for PSNS & IMF, the Navy must evaluate documents and pertinent data, inspect the site, and conduct interviews relevant to the hazardous waste generation at the site and disposal in order to assess whether or not the remedies previously selected are functioning as intended. The Navy completed the fourth and most recent 5-year review in October of 2017 and has scheduled to complete the next 5-year review in 2022 (Navy, 2017). Actions taken under CERCLA by the Navy could have cumulative effects on public health and safety, hazardous materials and waste, and biological resources.	X	X	X

Table 4-1: Actions and Other Environmental Considerations Identified for the Cumulative Impacts Analysis (continued)

Project	Location	Project Description	Project Timeframe		
			Past	Present	Future
Actions Carried Forward Under the Integrated Natural Resources Management Plan (INRMP) Naval Base (NAVBASE) Kitsap	NAVBASE Kitsap	This INRMP combines and updates existing individual natural resource management plans at NAVBASE Kitsap properties. The INRMP is consistent with the military use of the property and would meet the goals and objectives established in the Sikes Act Improvement Act. This revised INRMP aims to implement an ecosystem-based conservation program and have a net-positive effect on environmental resources compared to the previous INRMP (Navy, 2018, 2019a). This INRMP could have cumulative effects on biological resources and cultural resources.		X	X
Manchester Fuel Tank Replacement, Manchester Fuel Depot	Manchester, Washington	Thirty-four of the original underground storage tanks at the Manchester Fuel Depot built in the 1940s and 1950s are being closed by the Navy. The decommissioned underground storage tanks are being filled with inert material per Washington state underground storage tank regulations. Additionally, the Navy built 6 new aboveground storage tanks that hold 125,000 barrels (5.25 Million [M] gallons) of fuel each, fueling docks, and other infrastructure to support the refueling facility. This is the largest military fueling facility in the continental United States (Marpac Construction, 2018). Construction and operation of this facility could have cumulative effects on air quality.		X	X
Annapolis Ferry Dock Upgrades	Port Orchard, Washington	Kitsap Transit completed construction on the expansion of the Annapolis ferry dock, which is located across Sinclair Inlet from PSNS & IMF. Operation of this ferry dock could have cumulative effects on biological resources and noise (Vosler, 2020).	X	X	X
Marina Square Hotel and Apartment Construction	Bremerton, Washington	The Marina Square Hotel and Apartment buildings were completed in 2022. The operation of this hotel and apartment building could have cumulative effects on socioeconomics and environmental justice, hazardous materials and waste, air quality, and noise.	X	X	X
Pile Replacement and Pier Maintenance	Naval Base Kitsap Bremerton, Washington	The Navy completed pile removal and replacement at Naval Base Kitsap Pier 4 in 2018. The National Marine Fisheries Service authorized the Navy take of marine mammals due to activities related to removal and installation of piles at Pier 4 (Navy, 2015). This project was completed in 2018 and its past construction could have cumulative effects on biological resources, and noise.	X		

Table 4-1: Actions and Other Environmental Considerations Identified for the Cumulative Impacts Analysis (continued)

Project	Location	Project Description	Project Timeframe		
			Past	Present	Future
Marine Structure Maintenance and Pile Replacement Activities, Navy Region Northwest	Puget Sound, Washington	The Navy is performing repair, maintenance, and replacement of piles in the Navy Northwest Region. This project covers all these activities for 2019–2023 (Navy, 2019a). This project could have cumulative effects on biological resources, air quality, hazardous materials and waste, and noise.	X	X	X
Navy Operations Carried Out Under the Northwest Training and Testing (NWTT) EIS/Overseas Environmental Impact Statement (OEIS) and Supplemental Environmental Impact Statement (SEIS)/OEIS	Pacific Northwest – PSNS & IMF	The NWTT EIS/OEIS and SEIS/OEIS states that training and testing activities are being conducted by the Navy in existing range complexes, operating areas, testing ranges, and Navy pier-side locations in the Pacific Northwest. The SEIS/OEIS does not cover on-land training and testing activities. The NWTT SEIS/OEIS was completed and released to the public in September 2020. PSNS & IMF is included in these documents. NWTT operations could cause cumulative effects on all resource categories with the exception of socioeconomics and environmental justice.		X	X
Renovations on Historic Building 460 at PSNS & IMF	PSNS & IMF	Building 460 is located at PSNS & IMF and houses the shipfitter and welder shops there. These renovations would add a rooftop railing and restore the 60-foot, four-panel sliding door of the building. The rooftop railing project has a budget of approximately $2.24M and the door restoration has a budget of approximately $1M (Stanford, 2018). This project could have cumulative effects on socioeconomics and environmental justice, cultural resources, and air quality.		X	X
Actions Carried out Under the Manchester Fuel Depot INRMP	Manchester, Washington	A revised INRMP is replacing the current INRMP that is consistent with the military use of the property and allows the base to meet the goals and objectives established in the Sikes Act Improvement Act. This revised INRMP aims to implement an ecosystem-based conservation program and have a net-positive effect on environmental resources (Navy, 2019a). This INRMP could have cumulative effects on all resource categories with the exception of socioeconomics and environmental justice.		X	X

Table 4-1: Actions and Other Environmental Considerations Identified for the Cumulative Impacts Analysis (continued)

Project	Location	Project Description	Project Timeframe		
			Past	Present	Future
Washington – Benton, Franklin, and Grant Counties					
Construction and use of the Clover Island Shoreline Transformation Project	Clover Island, Kennewick, Washington	Clover Island has a long history of shoreline management projects. This project is funded by a $1M allocation from the city of Kennewick. The city of Kennewick has been improving the infrastructure and shoreline of the island. These improvements include shoreline stabilization, trail construction, installation and improvement of utility and drainage infrastructure, landscaping, and preparation of commercial building sites. The Port of Kennewick will own and manage the new buildings slated for commercial use (County of Benton, 2021a). This project is currently in progress. Construction and use of this Clover Island project could have cumulative effects on socioeconomics and environmental justice, biological resources, hazardous materials and waste, air quality, and noise.		X	X
Columbia Gardens Development	City of Kennewick & Port of Kennewick, Washington	Development of the Columbia Gardens is complete and the infrastructure and new buildings are operational. Development included construction of infrastructure such as sewer extensions and parking areas along with two buildings on a 6-acre parcel to prepare space for restaurants, retail, and other similar types of businesses. The total budget for this development was $1.1M and is expected to result in over 100 permanent jobs (County of Benton, 2021b). Construction and operation of the Columbia Gardens Development could have cumulative effects on socioeconomics and environmental justice, hazardous materials and waste, and noise.	X	X	X
Construction of new Administration Building at Benton County's Kennewick Complex	Kennewick, Washington	The County of Benton was awarded $13.6M to build a new administrative office building in west Kennewick. This building relieves the overcrowded office building the county administration operated from. Construction began in February 2020 (Kraemer, 2020) and was completed in December 2021. Operation of this new building could have cumulative effects on transportation, hazardous materials and waste, biological resources, cultural resources, air quality, and noise.	X	X	X

Table 4-1: Actions and Other Environmental Considerations Identified for the Cumulative Impacts Analysis (continued)

Project	Location	Project Description	Project Timeframe		
			Past	Present	Future
Operation of the Federal Columbia River Power System	Columbia River Basin	Located on the mainstem Columbia River and in several of its major tributaries, the Federal Columbia River Power System comprises 33 hydroelectric projects in the Columbia River Basin and provides about one third of the electricity used in the Pacific Northwest. The U.S. Bureau of Reclamation and the U.S. Army Corps of Engineers (USACE) planned, designed, constructed, own, and operate the federal water projects in the Pacific Northwest. Operation of these dams, most notably McNary Dam and Lake Wallula, and their associated reservoirs and shorelines have demonstrated the ability to improve fish passages along the Columbia and Snake Rivers. Continued operations of these dams and reservoirs could have cumulative effects on biological, cultural, and protected tribal resources.		X	X
Grand Coulee Fish Maintenance Project Operations	Above Grand Coulee Dam on the Columbia River	This project was established in 1937 and established National Fish Hatcheries as mitigation to compensate for anadromous fish losses above Grand Coulee Dam. Entiat, Leavenworth, and Winthrop National Fish Hatcheries are mitigation hatcheries established by the Grand Coulee Fish Maintenance Project (1937) to compensate for anadromous fish losses above Grand Coulee Dam. All three produce spring or summer Chinook salmon, and Winthrop National Fish Hatchery produces steelhead. Coho salmon are also raised in cooperation with the Yakama Nation. (USFWS, 2014). This project, along with the Proposed Action, could have cumulative effects on biological resources.	X	X	X
Yakima/Klickitat Fisheries Project Operations	Columbia River	The Yakima/Klickitat Fisheries Project is one of the largest fishery management projects in the Columbia River Basin. The goal of the project is to "restore sustainable and harvestable populations of salmon, steelhead, and other at-risk species to the Yakima and Klickitat sub-basins of the Columbia River" (Yakima Nation Fisheries, 2020). This project could have cumulative effects on protected tribal resources and biological resources.		X	
Odessa Groundwater Replacement Project Operation	Columbia Basin Project, Grand Coulee Dam	The U.S. Bureau of Reclamation is implementing a project to reduce reliance on the Odessa Aquifer by replacing irrigation flows with water sourced from the Columbia River. Diversions would primarily occur from Grand Coulee Dam to Lake Roosevelt, then be pumped into the Feeder Canal for storage at Banks Lake. From Banks Lake, water would be delivered to the Columbia Basin Project users. These diversions would occur upstream from Hanford Reach, but would remove approximately 164,000 acre-feet per year from the Columbia River, thereby reducing annual flows downstream. This project, along with the Proposed Action, could have cumulative effects on biological resources.		X	X

Table 4-1: Actions and Other Environmental Considerations Identified for the Cumulative Impacts Analysis (continued)

Project	Location	Project Description	Project Timeframe		
			Past	Present	Future
Modification of the Right Embankment of the Priest Rapids Dam	The Priests Rapids Dam	The Federal Energy Regulatory Commission issued a Final Environmental Assessment in January 2021 amending Grant County Public Utility District's license to modify the right embankment of the Priest Rapids Dam, immediately upstream from the Hanford Site on the Columbia River. The project replaces the existing earthen dam, adds reinforcement to the right bank of the river to address the stability of the embankment near the Priest Rapids Dam facility, ensures the safety of the neighboring Wanapum Indian tribal village below, and improves earthquake safety. A new roller-compacted concrete dam with a short connecting embankment and secant pile cut-off wall will be tied into the existing embankment. The dam will be constructed on basalt bedrock downstream from the existing embankment. This project, along with the Proposed Action, could have cumulative effects on biological resources.		X	X
Virginia – Newport News					
Naval Facilities and Engineering Command (NAVFAC) Waterfront Construction Projects	NAVFAC Mid-Atlantic Hampton Roads Metropolitan Area	In 2018, NAVFAC Mid-Atlantic awarded 5 contracts totaling $95M in the adjacent areas of the Hampton Roads Metropolitan Area, Virginia, to 5 individual contractors. These contracts could include "construction, renovation, alteration, and repairs for general construction projects" on elements of "warehouses, training facilities, personnel support and service facilities, housing facilities, etc.," according to the DoD webpage (DoD, 2018). All of these projects are expected to be completed by July 2027. Their past construction and continued usage could have cumulative effects on socioeconomics and environmental justice, biological resources, air quality, waste management, and noise.		X	X
Texas – Brownsville					
Brazos Island Harbor (BIH) Channel Improvement	BIH Channel, Port of Brownsville, Texas	This project is under jurisdiction of Texas Department of Transportation (TDOT) and construction phase began in 2019 and is expected to take 2–3 years. Construction involved in this project includes dredging (Texas Department of Transportation, 2018). Phase Two of the project was funded in March 2022 at $68 million. Once the project is complete, the Brownsville Ship Channel will be one of the deepest ship channels in the Gulf of Mexico. Impacts from the BIH Channel improvement project, combined with the Proposed Action, could have cumulative effects on socioeconomics and environmental justice, biological resources, hazardous materials and waste, and air quality.		X	X

Table 4-1: Actions and Other Environmental Considerations Identified for the Cumulative Impacts Analysis (continued)

Project	Location	Project Description	Project Timeframe		
			Past	Present	Future
Construction of Overweight Road Connecting the Port of Brownsville and State Highway 4	Brownsville Ship Harbor, Texas	The TDOT granted environmental clearance for the construction of a 2-mile overweight road connecting the Port of Brownsville and State Highway 4. Construction was completed in March 2022. Operation of this road along with the Proposed Action could have cumulative effects on hazardous materials and waste, biological resources, air quality, and noise.	X	X	X
New Passenger Terminal Construction at Brownsville/South Padre Island International Airport (BRO)	Brownsville, Texas BRO	The BRO completed construction on its new passenger terminal, and it has been operational since early 2020. The new building is almost 50,000 square feet larger than the original terminal building at the airport which is 37,000 square feet. Included in this project is also an extension of the runway by 3 kilometers. Given the proximity of the BIA to the Port of Brownsville, construction and operation of the new terminal, combined with the Proposed Action, could have cumulative effects on socioeconomics and environmental justice, hazardous materials and waste, biological resources, air quality, and noise.		X	
Liquified Natural Gas (LNG) Terminal Construction	Brownsville Ship Channel, Texas	The Federal Energy Regulatory Commission has prepared a Final EIS in 2019 for the siting, construction, and operation of an LNG terminal. Construction of the terminal and other necessary infrastructure will consist of a pipeline meter station, natural gas pretreatment and liquefaction facilities, two LNG storage tanks, marine dock and LNG transfer facilities, control room, administration/maintenance building, site access road, and utilities (power, water, and communication systems). The construction involved in this project, along with the Proposed Action, could have cumulative effects on air quality, biological resources, and socioeconomics and environmental justice.			X
SpaceX Launch Facility	Boca Chica, Texas	The SpaceX Launch Facility in Boca Chica, Texas, is located in the same air basin as the Brownsville location. The launch and testing operations involved at this facility, along with the Proposed Action, could have cumulative effects on air quality and noise.	X	X	X

Table 4-1: Actions and Other Environmental Considerations Identified for the Cumulative Impacts Analysis (continued)

Project	Location	Project Description	Project Timeframe		
			Past	Present	Future
Alabama – Mobile Bay & Mobile County					
Dismantlement of Surface Ship Support Barge in Alabama Shipyard	Alabama Shipyard, Mobile Bay	Dismantlement has begun at the Alabama Shipyard of the Navy decommissioned Surface Ship Support Barge. The dismantlement is a joint venture between APTIM Federal Services, LLC and Alabama Shipyard. The project is expected to be complete in 2024 and is budgeted at $129 million. As a result, this project is expected to create hundreds of jobs in Mobile (Alabama Shipyard, 2021). Alabama Shipyard intends on keeping the containment structure and using it as weather protection for other equipment. During dismantlement, this project, along with the Proposed Action, could have cumulative effects on hazardous materials and waste, and socioeconomics and environmental justice.		X	
Automotive Roll-On Roll-Off Terminal Construction	Port of Mobile, Mobile River, Alabama	The Alabama State Port Authority (ASPA) announced a concession agreement had been signed in early 2020 for construction of the AutoMOBILE International Terminal. The project secured about $42M in funding, and the terminal is now operational (Harris, 2021). Construction and operation of the new terminal, along with the Proposed Action, could result in cumulative effects on socioeconomics and environmental justice, biological resources, hazardous materials and waste, air quality, and noise.	X		
Interstate (I)-10 Bridge Improvement	I-10 crossing and adjacent to Mobile River, Alabama	This project has been redrafted after its initial proposal received concern and objection from the public. Following this project being redrafted, decision makers, including the Mayor of Mobile, announced a new plan for the bridge that incorporated public feedback while still achieving the goal of reducing seasonal congestion (Alabama Political Reporter, 2021). As of December 2022, the I-10 Mobile River Bridge and Bayway project is moving forward with federal funding and is set for completion in 2028. Along with the Proposed Action, this project could have cumulative effects on socioeconomics and environmental justice, air quality, and noise.		X	X
Activities Carried Out Under the Mobile Harbor General Reevaluation Report (GRR) with Integrated SEIS	Port of Mobile, Alabama	The USACE and ASPA have signed the Record of Decision for the Mobile Harbor GRR SEIS (International Dredging Review, 2019). Construction is underway and is expected to be complete for all phases in 2025 (USACE, 2021). This project includes six phases to ultimately dredge within the Port of Mobile to deepen and widen certain bar, bay and river channels, incorporate minor bend easing, and expansion of the Choctaw Pass turning basin. In total this project would include a minimum dredging of 1.5M cubic yards of dredge material (International Dredging Review, 2019). This project, along with the Proposed Action, could have cumulative effects on socioeconomics and environmental justice, biological resources, hazardous materials and waste, air quality, and noise.		X	

Table 4-1: Actions and Other Environmental Considerations Identified for the Cumulative Impacts Analysis (continued)

Project Description			Project Timeframe		
			Past	Present	Future
Activities Carried Out Under the National Fish and Wildlife Foundation (NFWF) Gulf Environmental Benefit Fund	Mobile Bay, Alabama Coast, and greater Gulf Coast	The NFWF Gulf Environmental Benefit Fund was established in the wake of two plea agreement approvals regarding the 2010 Deepwater Horizon explosion and oil spill from BP and Transocean. The agreement awarded $2.5 billion to the NFWF for habitat restoration and other conservation projects to combat oil damage along the Gulf Coast (National Fish and Wildlife Foundation, 2018). In Alabama alone there are 36 projects funded by the NFWF and other conservation investments totaling $355M (National Fish and Wildlife Foundation, 2020). These projects include restoration, habitat enhancement, and conservation acquisition projects. Since these projects aim to minimize environmental damage from the Deepwater Horizon oil spill, they are low impact and intended to benefit the overall ecosystem. Given that these projects are intended to result in positive environmental impacts, when combined with the Proposed Action, there could be cumulative effects on socioeconomics and environmental justice, biological resources, and air quality.	X	X	X
Phase 3 of Container Terminal Expansion	Port of Mobile, Mobile River, Alabama	The ASPA completed construction in March 2020 of a 400-foot container dock extension (Work Boat Staff, 2020). This expansion allows the berth to safely and easily handle two container ships simultaneously. While this project is completed, residual effects from construction and current effects from operation, combined with the Proposed Action, could have cumulative effects on socioeconomics and environmental justice, biological resources, hazardous materials and waste, and air quality.		X	X

Note: USFWS = U.S. Fish and Wildlife Service

4.3 Resource-Specific Cumulative Impact Analysis

Since the information available on past, present, and reasonably foreseeable actions varies in quality and level of detail, impacts of these actions were quantified where available data made it possible; otherwise, professional judgment and experience were used to make a qualitative assessment of impacts. Due to the large scale of the study area and multiple activities and stressors interacting in the ocean and land environment (Table 4-1), the analysis for the incremental contribution to cumulative stress that the Proposed Action may have on a given resource is largely qualitative.

Chapter 3 (Affected Environment and Environmental Consequences) of this EIS/OEIS includes a robust discussion of cumulative effects in that it takes into account the current condition of each resource as impacted by past and present human activity, and by prospects for recovery reflecting relevant future activity. Chapter 3 (Affected Environment and Environmental Consequences) includes discussion of the "general threats," an analysis of aggregate project effects, and a broader level analysis specific to areas where impacts are concentrated (i.e., the Study Area and areas immediately adjacent). Therefore, the Chapter 3 (Affected Environment and Environmental Consequences) analysis is referenced and briefly summarized in each section below to provide context and perspective to the rationale for the conclusions that the Proposed Action would have an insignificant contribution to the cumulative stress experienced by these resources, when specific past, present, and reasonably foreseeable actions are added to the analysis.

In this chapter, cumulative impacts were analyzed for each resource addressed in Chapter 3 (Affected Environment and Environmental Consequences). Analysis was not separated by alternative because the data available for the cumulative effects analysis was mostly qualitative in nature and, from a landscape-level perspective, these qualitative impacts are expected to be generally similar.

Under the Proposed Action, the Navy would implement the mitigations detailed in Section 3.9 (Summary of Potential Impacts on Resources and Impact Avoidance and Minimization) to avoid or reduce potential impacts on biological, socioeconomic, and cultural resources in the Study Area.

4.3.1 Public and Occupational Health and Safety

4.3.1.1 Region of Influence

The ROI for public health and safety is the project area, immediate surrounding areas, and transportation routes for hazardous and radioactive waste.

4.3.1.2 Impacts of Other Actions

Other actions being conducted at or in the vicinity of Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF), the Port of Benton barge slip modification area, and the Department of Energy (DOE) Hanford Site transport route could produce similar occupational and public health and safety hazards on the same scale as Alternatives 1 and 2 (the reactor compartment packaging alternatives). However, these actions would also be required to comply with applicable federal, state, and local regulations.

Other actions on or in the vicinity of commercial shipyards, under the reactor compartment packaging alternatives (partial dismantlement) and Alternative 3 (Preferred Alternative, complete dismantlement), could produce similar occupational and public health and safety hazards as the Proposed Action, but no other single ship dismantlement or repair project would likely be larger than the dismantlement of ex-Enterprise. However, the combination of multiple smaller concurrent projects could result in similar

or greater potential for impacts. All of these actions would be required to implement occupational health and safety measures and implement controls to protect the health and safety of the public required by state and federal regulations. These mandated requirements would reduce potential impacts on overall public health and safety to less than significant levels.

4.3.1.3 Impacts of the Proposed Action That May Contribute to Cumulative Impacts

Ports and shipyards are hubs for sources of air pollution from the movement of ships, trucks, trains, and other cargo-carrying equipment. Air pollution can cause health effects such as asthma, respiratory disease, cardiovascular disease, lung cancer, and premature death. Workers and residents in these communities are frequently subject to increased air pollution. As such, the Proposed Action would have the potential to contribute to cumulative public health and safety impacts at commercial shipyard sites, PSNS & IMF, the Port of Benton barge slip, the DOE Hanford Site transport route, or during waste transportation from commercial shipyard sites to disposal sites. However, these impacts would be short term, temporary, and minimized with the implementation of regulatory-driven controls. Since public health and safety impacts from operations and transportation would be addressed with the incorporation of well-established safety requirements, the Proposed Action would not have a significant impact on the cumulative impacts on public health and safety.

Throughout operations, ship towing, heavy-lift ship transportation, and waste transportation, the Proposed Action would be required to incorporate safety and environmental control measures mandated by federal and state laws.

4.3.1.4 Cumulative Impacts on Public and Occupational Health and Safety

For operations at PSNS & IMF and at commercial shipyards, controls are mandated at the site level and not the project level. In accordance with these requirements, air emissions permits, water discharge permits, and occupational safety and radiation safety plans and procedures would be implemented to protect site workers and the public. In compliance with applicable regulatory requirements, the Proposed Action would prevent unsafe exposures of site workers and the public to hazardous environments and would not result in significant cumulative impacts at PSNS & IMF and at commercial shipyards. Likewise, with compliance of existing regulations and ship storage procedures, the No Action alternative would not result in significant cumulative impacts.

At PSNS & IMF, the Port of Benton barge slip, and at the DOE Hanford Site, occupational exposures and public exposures would be limited based on all facility operations and not just the Proposed Action. For example, environmental release limits from PSNS & IMF are based on all emission sources on the site, and the radiation dose limit to the public is based on exposure to all potential radiation sources on the site. For a site radiation worker, his/her radiation dose is limited to 5,000 millirem per year for all projects he/she is engaged in regardless of how many projects they are working on or the project locations. According to the report titled *Occupational Radiation Exposure from U.S. Naval Nuclear Plants and their Support Facilities* (Navy, 2019b), no Program personnel have exceeded 40 percent of the Program's annual limit between 1980 and 2018 (i.e., no personnel have exceeded 2 Roentgen equivalent man in any year in the last 39 years), and no civilian or military Program personnel have ever, in over 60 years of operation, exceeded the federal lifetime dose limit (the federal lifetime dose limit was eliminated in 1994). Because the radiation dose for a site radiation worker falls below the annual total effective dose equivalent, the Proposed Action, in conjunction with other projects near PSNS & IMF, the barge slip, and the DOE Hanford Site transport route, would not result in significant cumulative impacts on public health and safety.

Under Alternative 3 (Preferred Alternative), annual radiation dose limits to workers provided in 10 Code of Federal Regulations 20, subpart C, Occupation Dose Limits, are to include doses received at any work site during a calendar year. Therefore, while doses can be accumulated from different projects, the dose limit does not change. Conversely, each radioactive materials licensee controls emissions and public exposures to meet off-site dose limits through its own license. Furthermore, the public dose limit of 100 millirem per year for Nuclear Regulatory Commission or state licensees is by design set sufficiently low that cumulative dose from multiple licensees is protective of public health.

4.3.2 Hazardous Materials and Wastes

4.3.2.1 Region of Influence

The ROI for the assessment of impacts of the Proposed Action from hazardous and radioactive waste are the project area and immediately surrounding areas. However, hazardous and radioactive waste disposal is not limited to the region of the Proposed Action; therefore, the cumulative ROI is nationwide.

4.3.2.2 Impacts of Other Actions

Commercial dismantlement locations in the Alternative 3 (Preferred Alternative) ROI would likely not have another concurrent dismantlement project generating LLRW. However, LLRW disposal has a nationwide ROI. There would likely be multiple operations with the ROIs for each of the Proposed Action alternatives, including neighboring or co-located shipyard operations, that would be generating non-radioactive and non-hazardous wastes for disposal and recycle. However, management of these waste streams has a regional ROI. Because of the Navy goal of limiting waste and maximizing recycling, the cumulative impact of these projects on waste disposal capacity in the timeframe of the Proposed Action would be insignificant. Because recycling is a commercial commodity, the ROI can be national or international. Other contributing projects could include ongoing and future commercial nuclear power plant decommissioning projects including those in California, Florida, New York, Wisconsin, and elsewhere; the decommissioning of small U.S. Army nuclear power reactors in northern Virginia and Alaska; the decommissioning of the Nuclear Ship Savannah (a nuclear-powered commercial ship currently located in Baltimore, Maryland); and other demolition and remediation projects. Because hazardous waste disposal is not limited to the region of the Proposed Action, the cumulative impact of these projects on hazardous waste disposal capacity in the timeframe of the Proposed Action would be less than significant.

4.3.2.3 Impacts of the Proposed Action That May Contribute to Cumulative Impacts

The Proposed Action would have the potential to contribute short-term cumulative impacts at the project sites and long-term at the disposal sites from generated wastes. The No Action alternative would not contribute to cumulative impacts.

Throughout operations and transportation, the Proposed Action would be required to incorporate hazardous and radioactive waste management measures mandated by federal and state laws. In compliance with applicable regulatory requirements, the Proposed Action would limit the impacts from the management and disposal of hazardous and radioactive materials and waste.

The reactor compartment packaging alternatives would result in the generation of hazardous waste from dismantlement activities at commercial shipyards and generation of LLRW at PSNS & IMF. Alternative 3 (Preferred Alternative) would also result in the generation of LLRW from dismantlement activities at commercial shipyards with no waste generated at PSNS & IMF. A total of approximately 17,600 cubic yards (yd^3) of radioactive waste would be generated under Alternative 3 (Preferred

Alternative) (conservatively assumes 40 yd^3 per shipment and 440 shipments). This amount would represent about 0.5 percent of Waste Control Specialist, LLC's licensed disposal capacity of 3.1 million yd^3 available for LLRW generated by the government. The LLRW disposal volume estimate is also less than 0.5 percent of EnergySolutions' disposal capacity of approximately 10 million yd^3 (Utah Division of Radiation Control, 2015). Therefore, the amount of generated waste would not have a noticeable cumulative effect on the disposal capacity at available disposal sites.

4.3.2.4 Cumulative Impacts on Hazards and Hazardous Materials

In 1996, the Navy prepared the *Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants*, which provides a cumulative analysis of 220 reactor compartment packages in Trench 94 at the DOE Hanford Site (Navy & DOE, 1996). This analysis encompasses ex-Enterprise reactor compartment packages because these compartments are similar in content to reactor compartments already evaluated and would not cause the total number within the trench to exceed 220. Radioactivity contained within Trench 94 poses no significant cumulative effect relative to the DOE Hanford Site (Navy & DOE, 2012).

The amount of hazardous wastes generated from the dismantlement of ex-Enterprise could have a noticeable impact on some hazardous waste operations. As provided in Table 3.2-1, an estimated 8,813 tons of hazardous waste would be generated from Alternative 3 (Preferred Alternative). The capacities of hazardous waste facilities differ greatly. In 2017, Chemical Waste Management Inc. in Emelle, Alabama, received more than 103,000 tons of hazardous waste (EPA, 2017a)[1], while US Ecology Texas near Robstown, Texas, received nearly 42,000 tons (EPA, 2017b).

Hazardous materials and waste impacts during dismantlement operations and disposal would be addressed with the incorporation of well-established waste management regulations and site-specific procedures accepted by regulatory agencies, therefore, no cumulative impacts would occur. Cumulatively, the impact of other actions on LLRW disposal capacity in the timeframe of the Proposed Action would be less than significant.

4.3.3 American Indian Tribal Resources and Tribal Rights

4.3.3.1 Region of Influence

The ROI for protected tribal resources and tribal rights includes elements in the Pacific Northwest: (1) the shipping route of the ex-Enterprise propulsion space section via heavy-lift ship from a commercial dismantlement facility to PSNS & IMF (following a route around South America), (2) areas within port and shipyard facilities at PSNS & IMF that may support dismantlement of ex-Enterprise, (3) infrastructure improvements in Trench 94 at the DOE Hanford Site for disposal of reactor compartment packages, (4) barge transport of reactor compartment packages from PSNS & IMF to the Port of Benton barge slip, (5) the immediate vicinity and surrounding habitats of the barge slip that may be subject to infrastructure improvements, and (6) land transport routes requiring infrastructure improvements that may impact protected tribal resources between the barge slip and the DOE Hanford Site. For the purposes of cumulative impacts, the ROI can broadly be defined as including Sinclair Inlet within Puget Sound, the coastal waterway around Puget Sound and along western Washington, the Columbia River to Upper Lake Wallula at the Port of Benton, and DOE Hanford Site. As such, this analysis

[1] EPA is an acronym for U.S. Environmental Protection Agency.

focuses on the reactor compartment packaging alternatives, and not the No Action Alternative or Alternative 3 (Preferred Alternative).

Project components in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; and Mobile, Alabama, including potential tow routes to these facilities from the current mooring location at Newport News Shipbuilding in Newport News, Virginia, are not included in the analysis because there are no "Indian lands" as defined by Department of Defense Instruction 4710.02, Department of Defense Interactions with Federally Recognized Tribes, that would be impacted by the tow route, commercial dismantlement facilities, or waste disposal and recycling facilities, and the Navy's outreach and research efforts have not identified protected tribal resources or tribal rights concerns for these locations.

4.3.3.2 Impacts of Other Actions

Based on the literature review, other actions may impact protected tribal resources through in-water demolition, construction, and dredging for waterfront improvements along Sinclair Inlet, including for the Bremerton Waterfront Improvements at PSNS & IMF. These actions could impact protected tribal resources and tribal rights if they adversely affect harvestability and availability of protected tribal resources, including fish and shellfish, and their habitat, or otherwise interfere with tribal fishing activities, for example, by preventing tribal fisherman from accessing their Usual and Accustomed fishing areas. Noise and vibrations from construction of in-water projects throughout Sinclair Inlet could cause changes in fish migration, making them more difficult to catch. In-water demolition, construction, and dredging could affect juvenile hatchery-released in Sinclair Inlet. Projects that result in removal of contaminated sediments from Sinclair Inlet would likely benefit protected tribal resources in the long term, including those completed under the Conducting Comprehensive Environmental Response Compensation and Liability Act and the revised ecosystem-based approach Integrated Natural Resources Management Plan for Naval Base Kitsap properties.

Other ongoing projects that have impacts on protected tribal resources include channel modifications along the Columbia River and tributaries. Along the Columbia River, including Upper Lake Wallula, projects with the most significant impacts on the recovery of fisheries are associated with the Grand Coulee Fish Maintenance Project, Yakima/Klickitat Fisheries Project, and continued operation of Federal Columbia River Power System dams. The fishery management projects seek to restore sustainable and harvestable fish populations, which are impacted by the continued operation of dams.

Other projects being conducted in the vicinity of PSNS & IMF and the Port of Benton barge slip would be required to comply with applicable federal, state, and local regulations. These requirements may reduce potential impacts on protected American Indian Tribal Resources and Tribal Rights.

Waterways and ports along the ROI are currently used by commercial, recreational, and other vessels including military vessels.

4.3.3.3 Impacts of the Proposed Action That May Contribute to Cumulative Impacts

As discussed in Section 3.3 (American Indian Tribal Resources and Tribal Rights), potential impacts on fish and fish habitat at the Port of Benton barge slip could occur with infrastructure improvements. However, there would be a temporary impact during construction, with the potential to improve salmonid habitat long term. Potential impacts could occur to the tribal Preservation Designated Area (PDA) at the DOE Pacific Northwest National Laboratory Site, with culturally significant protected tribal resources, due to road improvements between the barge slip and Trench 94 at the DOE Hanford Site. The Proposed Action would be required to comply with applicable federal, state, and local regulations.

The Navy would consult with affected tribes and impacts, if any, would be determined upon the results of those consultations.

4.3.3.4 Cumulative Impacts on American Indian Traditional Resources

The cumulative consequences of other projects together with the Proposed Action would not significantly impact American Indian protected tribal resources or tribal rights at any of the locations. Temporary impacts on fish and fish habitat at the Port of Benton barge slip could occur but the modifications have the potential to improve salmonid habitat long term. Pending consultation, potential impacts on the tribal PDA at the DOE Pacific Northwest National Laboratory Site could occur to culturally significant biological resources, but protective measures could be used to prevent or minimize potential disturbances during construction. As a result, the Proposed Action would not combine with impacts from other past, present, or future actions in a manner that would create a cumulative impact.

4.3.4 Socioeconomics and Environmental Justice

4.3.4.1 Region of Influence

The ROI for socioeconomic and environmental justice analysis includes the independent cities and counties immediately surrounding the naval and commercial facilities in Virginia, Texas, Alabama, and Washington state where the dismantlement and disposal of ex-Enterprise may occur. The ROI for Virginia includes the independent cities of Newport News, Hampton Roads Metropolitan Area, Virginia Beach, Chesapeake, Portsmouth, Poquoson, Suffolk, and Williamsburg, and Isle of Wright, Surry, York, and James City counties. The ROI for Texas includes the city of Brownsville and Cameron, Hidalgo, and Willacy counties. The ROI for Alabama includes the City of Mobile, and Mobile and Baldwin counties. Finally, the ROI for Washington includes the City of Bremerton and Kitsap County, in which PSNS & IMF are located, the city of Pasco and Franklin County, as well as the cities of Kennewick and Richland and Benton County, where the Port of Benton barge slip and the DOE Hanford Site are located.

4.3.4.2 Impacts of Other Actions

Other projects in the ROI have the potential to produce minor impacts on minority and low-income populations, local economy and housing. However, other projects would be required to comply with applicable federal, state and local regulations. Secondary or indirect cumulative impacts on socioeconomic resources are dependent on the availability of other resources to populations, such as housing, and the local economy. Secondary or indirect cumulative impacts on environmental justice populations would be evaluated for each action, and therefore would not contribute meaningfully to cumulative impacts on environmental justice populations in the ROI. Waterways and ports are currently used along the ROI and are traveled by commercial, recreational and other vessels including military.

4.3.4.3 Impacts of the Proposed Action That May Contribute to Cumulative Impacts

The analysis in Section 3.4 (Socioeconomics and Environmental Justice) indicates that the Proposed Action is not expected to result in long-term impacts. There would not be a disproportionate impact on environmental justice populations and impacts on socioeconomic resources in the ROI would be minimal. Long-term storage of ex-Enterprise under the No Action Alternative is not likely to measurably improve or impact the socioeconomic condition and environmental justice populations of the ROI since it would be maintained in waterborne storage at its current location at Newport News Shipbuilding, in Newport News, Virginia. These activities would be in alignment with typical shipyard activities and would result in negligible effects above baseline conditions at the storage facility. The Proposed Action would benefit the local economy in utilizing local resources and labor for the Port of Benton barge slip

modifications. The additional work would indirectly contribute to the local economy by adding increases in revenue and workforce wages, which would result in spending and stimulation of the local economy. There would be no socioeconomic change in shipyard regions since the work performed would neither increase nor decrease housing unit levels or availability. Under Alternative 3 (Preferred Alternative), approximately 94 workers would temporarily relocate to the commercial dismantlement facility. The number of workers needing to relocate may be fewer if the facility is in the Hampton Roads Metropolitan Area, since local workers have the skills to dismantle a nuclear-powered ship. However, neither number of workers represents a meaningful increase in population or housing since they would only relocate temporarily.

The Proposed Action would take place in established shipping channels, the open ocean, and in existing industrial complexes, away from the general public and environmental justice communities. All dismantlement and transportation activities would be conducted in compliance with applicable federal, state, and local laws and regulations. Ex-Enterprise dismantlement and disposal would not result in significant impacts on environmental justice populations, therefore no disproportionate impacts on environmental justice populations would occur.

4.3.4.4 Cumulative Impacts on Socioeconomics and Environmental Justice

The analysis in Section 3.4 (Socioeconomics and Environmental Justice) indicates that impacts on socioeconomic resources would be temporary and activities associated with the Proposed Action would not result in disproportionate impacts on environmental justice populations. Therefore, there would be no significant cumulative impact on socioeconomics resources or disproportionate impacts on environmental justice populations in the ROI as a result of the Proposed Action and other projects in the area.

4.3.5 Biological Resources

4.3.5.1 Region of Influence

As stated in Section 3.5.1.1 (Region of Influence), the Study Area for biological resources included the following locations: (1) areas within port and shipyard facilities that may support dismantlement of ex-Enterprise; (2) Port of Benton barge slip that may be subject to infrastructure improvements; and (3) land transportation routes requiring infrastructure improvements that may impact biological resources. For the purposes of cumulative impacts, the ROI can broadly be defined as including Sinclair Inlet within Puget Sound, the Upper Lake Wallula of the Columbia River, and bays and intercoastal waterways surrounding port facilities considered in this analysis.

The context for the analysis of biological resources provided in Section 3.5.1.2 (Regulatory Framework) includes adherence to state and federal guidelines enacted under various regulatory frameworks. In support of this EIS/OEIS, the Navy conducted a literature review and identified various species-specific recovery plans, location-specific natural resource planning documents, and regional conservation initiatives that concern biological resources potentially impacted by the Proposed Action. The analysis for cumulative impacts of the Proposed Action on biological resources considers potential impacts on these plans and initiatives.

4.3.5.2 Impacts of Other Actions

Based on the literature review, other actions may impact biological resources through channel modifications along the Columbia River and tributaries, riparian habitat degradation, agricultural activities, and predation and competition from non-native species (Bond et al., 2019; Gamble, 2016). For

species within the Upper Lake Wallula of the Columbia River, the projects with the most significant impacts on the recovery of fisheries are associated with the Grand Coulee Fish Maintenance Project and continued operation of Federal Columbia River Power System dams. In addition, public utility districts upstream of Lake Wallula own and operate dams and fish passage systems, affecting the amount and timing of water flowing into upper Lake Wallula, as well as fish passage through the area. Grant Public Utility District owns and operates Priest Rapids and Wanapum dams. Chelan Public Utility owns Rock Island and Rocky Reach dams. Douglas Public Utility owns one more non-federally owned dam before the U.S. Canadian border—Wells Dam that forms Lake Pateros. The Federal Energy Regulatory Commission issued a Final Environmental Assessment in January 2021 amending Grant County Public Utility District 's license to modify the right embankment of the Priest Rapids Dam, immediately upstream from the Hanford Site on the Columbia River. The project replaces the existing earthen dam, adds reinforcement to the right bank of the river to address the stability of the embankment near the Priest Rapids Dam facility, ensures the safety of the neighboring Wanapum Indian tribal village downstream, and improves earthquake safety. A new roller-compacted concrete dam with a short connecting embankment and secant pile cut-off wall will be tied into the existing embankment. The roller compacted concrete dam will be constructed on basalt bedrock downstream from the existing embankment. The project team will be monitoring for potential dam failures 24 hours a day, 7 days a week while excavating behind the existing embankment. Project duration is from 2021 through 2024, with anticipated completion of the project in January 2024.

Other ongoing projects that have fewer impacts but are important to the understanding of incremental and cumulative impacts include reclamation projects, such as the U.S. Bureau of Reclamation proposed Odessa Groundwater Replacement Project. This project entails replacing the groundwater source for irrigating 70,000 acres within the existing boundaries of the Columbia Basin Project with surface water from the Columbia River at Lake Roosevelt. Following full implementation, the Odessa Groundwater Replacement Project would withdraw an average of 164,000 acre-feet of water annually from Lake Roosevelt via the Keys Pumping Plant at Grand Coulee Dam. As with the Federal Columbia River Power System, project proponents have a long history of Section 7 Endangered Species Act consultations with the National Marine Fisheries Service and U.S. Fish and Wildlife Service, which have resulted in a minimization of potential impacts on fisheries. In addition, the Port of Benton continues to service the agribusiness, manufacturing, technology, transportation, and tourism sectors. These projects also must go through other agency regulatory reviews, such as U.S. Army Corps of Engineers-administered programs under this agency’s mandate to administer Section 10 of the Rivers and Harbors Act of 1899 and Section 404 Clean Water Act of 1972.

4.3.5.3 Impacts of the Proposed Action That May Contribute to Cumulative Impacts

As detailed in Section 3.5 (Biological Resources), the primary stressors on biological resources include the following:

- stressors associated with in-water hull cleaning which potentially impact water and sediment quality at the current mooring location (Newport News Shipbuilding), including release of chemicals associated with antifouling paints, depression of dissolved oxygen from the decay of organic matter removed from the hull prior to towing
- stressors associated with ship strike and tow line strike, from towing of ex-Enterprise from the current mooring location to destination ports
- stressors associated with ship noise from ships in transit resulting from propulsion sounds as tug boats or heavy lift ships transit through an area

- stressors associated with construction activities at the Port of Benton, Washington, including water and sediment quality impacts associated with barge slip and substrate modifications, as well as construction noise from on-land pile driving and in-water construction activities
- stressors associated with ground disturbance associated with land transport route modifications from the Port of Benton barge slip to Trench 94 at the DOE Hanford Site

For all alternatives analyzed in this EIS/OEIS, these stressors would likely cause temporary impacts at the current mooring location of ex-Enterprise, and initial transit routes from the current mooring location to destination ports. If Alternative 2 is selected, infrastructure improvements at the Port of Benton barge slip would introduce sound into the water and potentially impact water quality in the immediate vicinity of the construction activity. These stressors would occur between November 1 and February 28—the standard practice for in-water construction activities designed to avoid salmonid migrations and minimize impacts. The Proposed Action would also replace the south jetty with a gravel substrate known to benefit juvenile salmonids and increase benthic forage production. This action would provide long-term benefits for salmonids in the project area. Additionally, bald eagles typically arrive in mid-November and occupy the shorelines during the winter months. Wintering eagles use different habitats for various daily activities including perching, foraging, roosting, and nesting. The review of buffer restrictions and historic and current nest site locations found no overlap with the land transport route. There are no large trees for roosts, perching, or nesting in the vicinity of the barge slip or along the land transportation route. Bald eagles, however, could forage in the river channel near the barge slip. The closest known nest is 7 miles downriver in the Yakima Delta and would not be impacted by the project.

4.3.5.4 Cumulative Impacts on Biological Resources

Taken together, the impacts of the Proposed Action, when considered in combination with other activities, would not exceed baseline conditions because of the very limited contribution of impacts from the Proposed Action. The Proposed Action as currently analyzed, would not have the potential to meaningfully combine with other projects to result in a significant cumulative impact on biological resources.

4.3.6 Air Quality

4.3.6.1 Region of Influence

As described in Section 3.6.2.1 (Region of Influence), the ROI for air quality is dependent on the type of pollutant, emission rates, other emission sources, and meteorology. For inert pollutants, the ROI is generally limited to a few miles downwind from the source. For a photochemical pollutant, such as ozone, the ROI may extend much farther downwind. The concentration of many small emission sources in a particular air basin, under the right circumstances, could incrementally contribute to regional air quality degradation.

The context for air quality analysis provided in Section 3.6 (Air Quality) includes adherence to state and federal plans enacted to achieve and maintain air quality. These plans were developed with direct, indirect, and cumulative impacts in mind. As the plans are developed, the establishment of significance criteria includes an inventory of existing emissions and the development of thresholds that ensure new activities avoid or mitigate significant air quality impacts. Unlike other resource areas, the analytical construct for this air quality analysis in Section 3.6 (Air Quality) is effectively a quantified look at applicable activity emissions and a region's ability to maintain or recover air quality as measured by the criteria air pollutants in light of other, existing emissions. As a whole, the air quality throughout the ROI

is generally very good or excellent as shown by ongoing monitoring of all criteria pollutants against National Ambient Air Quality Standards and State Ambient Air Quality Standards (Section 3.6.3 [Affected Environment]).

4.3.6.2 Impacts of Other Actions

The majority of the relevant, past, present, and reasonably foreseeable actions considered as part of the cumulative impacts in Section 4.2 (Projects and Other Activities Analyzed for Cumulative Impacts) that contribute to emissions of criteria air pollutants involve construction activities. These projects include development of a new facility, demolition or renovation of existing facilities, or road construction/maintenance.

Present and reasonably foreseeable projects in Virginia that could produce increases in air emissions include, but are not limited to, the following projects: the Hampton Roads Bridge-Tunnel Expansion and the Newport News Atkinson bridge construction. Present and reasonably foreseeable projects in Brownsville, Texas that could produce localized air emissions include, but are not limited to, the following projects: Brazos Island Harbor Channel Improvement Project, Dock Maintenance Dredging, Construction of Overweight Road connecting the Port of Brownsville and State Highway 4, Space X, and the new passenger terminal at Brownsville/South Padres Island International Airport. Present and reasonably foreseeable projects in Mobile, Alabama include, but are not limited to, construction activities, such as development of a new facility, demolition or renovation existing facilities, or road construction/maintenance.

Most projects identified at this time are slated to be complete prior to the onset of any commercial ship dismantlement. Therefore, no projects are currently identified that would overlap with the Proposed Action to create a cumulative impact on air quality.

4.3.6.3 Impacts of the Proposed Action That May Contribute to Cumulative Impacts

As detailed in Section 3.6 (Air Quality) sources of emissions from the proposed alternatives would include ships, vehicles or trains, as well as construction equipment. The Proposed Action would result in localized and temporarily elevated emissions, but criteria pollutant would not exceed *de minimis* thresholds. Fugitive dust from Port of Benton barge slip and road improvements are expected, but implementation of dust control measures (e.g., watering, minimize activity during high wind events, speed limits) would minimize these impacts. Hazardous air pollutant emissions are anticipated to be small and were dismissed as a stressor of impact. Hazardous air emissions from vehicles and equipment used for Port of Benton barge slip modifications and improvements to the Hanford Site Route 2S roadway under Alternative 2 would also be reduced by on-board emission control devices (e.g., catalytic converters, filters, positive crankcase ventilation valves) maintained in accordance with manufacturers' recommendations, minimizing unnecessary vehicle idling, and use of ultra-low sulfur diesel fuel (15 parts per million maximum).

4.3.6.4 Cumulative Impacts on Air Quality

The Proposed Action would have a very limited contribution to air pollutants. The past projects that were described above were mostly construction projects. Following their completion, they ceased to produce pollutant emissions, or produced only insignificant amounts of emissions going forward. Therefore, these projects no longer produce pollutants that impact the ambient air quality and are not considered further in this cumulative analysis.

The aspect of the Proposed Action that would lead to the most predominant impact on the ambient air quality of the region would be the construction under Alternative 2 associated with Port of Benton barge slip widening or road improvements associated with transport of reactor compartment packages to Trench 94. However, their impacts on the ambient air quality would only persist for as long as construction. Following their completion, the ambient air quality would return to its former levels. As to the Proposed Action as currently analyzed, it would not have the potential to meaningfully combine with other projects to result in a significant impact on ambient air quality. There would be no significant cumulative impact on air quality in any of the counties in the ROI as a result of the Proposed Action and other projects and actions in the area.

4.3.7 Cultural Resources

4.3.7.1 Region of Influence

The areas reviewed for cultural resources include locations containing port and shipyard facilities that may support the storage or complete dismantlement of ex-Enterprise within Mobile, Alabama; Brownsville, Texas; or Hampton Roads Metropolitan Area, Virginia, the Port of Benton barge slip, the DOE Hanford Site transport route, and Trench 94 at the DOE Hanford Site. The protection and preservation of cultural resources is governed by a number of federal laws, statutes, and executive orders; the context for cultural resources analysis provided in Section 3.7 (Cultural Resources) includes adherence to state and federal guidelines enacted under various regulatory frameworks.

4.3.7.2 Impacts of Other Actions

Based on the literature review, other actions could adversely affect historic and prehistoric archaeological sites, built environment resources, or Native American sacred sites. In undeveloped areas, cultural resources could be impacted by surface removal of vegetation resulting in erosion or loss of native plant species, which may also impact tribal use of traditional plant species. Construction projects or grading activities may impact or destroy cultural resources. For built environment resources, construction of modern infrastructure may contribute to changes in the viewshed or setting of Historic Districts. Modifications to structures or objects may result from projects potentially impacting the integrity of historic properties.

4.3.7.3 Impacts of the Proposed Action That May Contribute to Cumulative Impacts

As detailed in Section 3.7 (Cultural Resources), the process the Navy used for identifying cultural resources included archival research of existing databases and previous cultural resources investigations, and literature research. Based on the analysis in Section 3.7 (Cultural Resources), the No Action Alternative, Alternative 1, and Alternative 3 (Preferred Alternative) would not result in any impacts on cultural resources. The barge slip modifications necessary to support Alternative 2 have the potential to impact cultural resources if the barge slip was to be determined eligible for listing in the National Register of Historical Places. Alternative 2 could also result in impacts on known and unknown archaeological resources during the implementation of improvements to the transport route between the Port of Benton barge slip and Trench 94 at the DOE Hanford Site. However, these impacts would be minimized and/or mitigated by the avoidance of known cultural resource locations during design of the transport route improvements and by the presence of an archaeological monitor for all grading or ground-disturbing work associated with the improvement activities. Potential impacts on known or unknown Traditional Cultural Properties or to the PDA may also occur under Alternative 2.

4.3.7.4 Cumulative Impacts on Cultural Resources

Taken together, the combined impacts of the Proposed Action and other activities would contribute incrementally to indirect and direct cumulative effects on cultural resources. However, the Proposed Action would not incrementally contribute to significant cumulative impacts associated with other past, present, or future projects on cultural resources.

4.3.8 Noise

4.3.8.1 Region of Influence

As described in Section 3.8.1.1 (Region of Influence), ROIs vary between the No Action Alternative and the three action alternatives. The ROI for the No Action Alternative includes Newport News Shipbuilding, Virginia. The ROI for the reactor compartment packaging alternatives includes the transit route from the current location of ex-Enterprise in Newport News Shipbuilding in Newport News, Virginia, to a commercial dismantlement facility; transit route from a commercial dismantlement facility to PSNS & IMF; the transit route from PSNS & IMF to the Port of Benton barge slip; the transit route from the barge slip to Trench 94 at the DOE Hanford Site; as well as Richland, Washington, surrounding areas, and Kitsap County, Washington. The ROI for Alternative 3 (Preferred Alternative) includes the transit route from the current location of ex-Enterprise in Newport News Shipbuilding, to a commercial dismantlement facility in Brownsville, Texas; Newport News, Virginia; or Mobile, Alabama, and their respective surrounding areas; or travel corridors from dismantlement facilities to the potential disposal sites in Clive, Utah, Aiken South Carolina, or Andrews, Texas.

4.3.8.2 Impacts of Other Actions

The majority of the relevant, noise-related past, present, and reasonably foreseeable actions considered as part of the cumulative impacts in Section 4.2 (Projects and Other Activities Analyzed for Cumulative Impacts) involve construction activities, such as development of a new facility, demolition or renovation of existing facilities, or road construction/maintenance.

Noise generating projects are identified in Section 4.2 (Projects and Other Activities Analyzed for Cumulative Impacts) as occurring throughout the ROI, and in support of roads, airports, or other infrastructure. Present and reasonably foreseeable projects in Virginia that could produce localized noise include, but are not limited to, the following projects: the Hampton Roads Bridge-Tunnel Expansion and the Newport News Atkinson bridge construction. New and ongoing projects would increase noise, but only in the immediate vicinity of the project. Noise attenuates, or decreases, with increasing distance from a project site. The amount of noise that may reach a sensitive receptor is both dependent on the equipment used (and the sound levels created by that equipment) and the distance to the sensitive receptor from the construction site. However, construction noise would be noticeable to persons living and working nearby and may cause additional annoyance. Construction related would result in short-term increases in daytime sound levels near those projects.

Present and reasonably foreseeable projects in Brownsville, Texas, that could produce localized noise include, but are not limited to, the following projects: Brazos Island Harbor Channel Improvement Project, Construction of Overweight Road connecting Port of Brownsville and State Highway 4, and the new passenger terminal at Brownsville/South Padres Island International Airport. The first two projects are in the same region as the commercial dismantlement facility. While the actions associated with these projects may increase the local noise, these sites are removed from sensitive receptors, thus minimizing their potential impact. The new passenger terminal project is complete and operations would not contribute to a cumulative rise in the ambient noise level in the ROI.

Present and reasonably foreseeable projects in Mobile, Alabama, that could produce localized noise include, but are not limited to, construction activities, such as development of a new facility, demolition or renovation of existing facilities, or road construction/maintenance. Most projects identified at this time are slated to be complete prior to the onset of any commercial ship dismantlement. Therefore, no projects are currently identified that would overlap with the Proposed Action to create a cumulative increase in the ambient noise environment.

4.3.8.3 Impacts of the Proposed Action That May Contribute to Cumulative Impacts

As detailed in Section 3.8 (Noise) the primary activities that create localized noise include ship dismantlement and recycling, transport of reactor plant components, and construction activities associated with Port of Benton barge slip modifications or improvements to the DOE Hanford Site transport route. Current commercial dismantlement facilities may not perform work similar to the Proposed Action at this time, but they are capable of ship dismantlement work. Aside from the larger size of ex-Enterprise, no new noise-generating activities would occur at the facilities and noise levels in surrounding communities are not anticipated to change. Similarly, transport from the dismantlement facility to the disposal site could occur by barge, truck, or rail. Barge transport would be similar to routine towing activities described under initial transport, and typically would occur at distances from shore and sensitive receptors where noise would not change the acoustic environment. The use of semi-trucks on highways is not anticipated to change the acoustic environment surrounding the transportation corridors because typical use is high, with many vehicles traversing the road per day.

Construction activities are the most likely to contribute to cumulative impacts. However, the impacts on the acoustic environment would be temporary, ceasing when the construction projects are complete. Further, proposed construction activities would not overlap with any identified noise generating project in the region.

4.3.8.4 Cumulative Impacts on Noise

Taken together, the combined impacts of the Proposed Action and other activities that would impact the noise environments would not exceed baseline conditions because of the very limited contribution of impacts from the Proposed Action. The Proposed Action as currently analyzed, would not have the potential to meaningfully combine with other projects to result in a significant impact on the acoustic environment.

4.4 Summary of Cumulative Impacts

The analyses presented in this chapter and the individual resource sections indicate that the incremental contribution of Alternative 1, Alternative 2, or Alternative 3 (Preferred Alternative) would not have the potential to contribute meaningfully to any potential significant cumulative impact with respect to any of these resource areas.

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5 OTHER CONSIDERATIONS REQUIRED BY NEPA

This chapter provides detailed information on other considerations required by the National Environmental Policy Act (NEPA) analyzed in this Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS).

5.1 Introduction

In accordance with the Council on Environmental Quality (CEQ) regulations for implementing NEPA, federal agencies shall, to the fullest extent possible, integrate the requirements of NEPA with other planning and environmental review procedures required by law or by agency practice so that all such procedures run concurrently rather than consecutively.

5.2 Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations

Implementation of the Proposed Action and alternatives for this EIS/OEIS would comply with applicable federal, state, and local laws, regulations, and executive orders. The United States (U.S.) Department of the Navy (Navy) is consulting with regulatory agencies, as appropriate, during the NEPA process and prior to implementation of the Proposed Action and alternatives to ensure that requirements are met.

In accordance with 40 Code of Federal Regulations (CFR) Part 1502.16(c), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and alternatives and the objectives of federal, regional, state, and local land use plans, policies, and controls. Table 5-1 identifies the principal federal and state laws and regulations that are applicable to the Proposed Action and alternatives, and describes briefly how compliance with these laws and regulations would be accomplished.

Table 5-1: Principal Federal and State Laws, Regulations, Executive Orders, and Policies Applicable to the Proposed Action and Alternatives

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	***Status of Compliance***
Regulations	
Archaeological Resources Protection Act of 1979, Title 16 United States Code (U.S.C.) Sections 470aa–470mm	No archaeological investigations on public lands are expected to occur for the Proposed Action and alternatives. Impacts on unknown or buried archaeological sites during the implementation of the Proposed Action and alternatives would be minimized by the presence of an archaeological monitor for any grading or ground-disturbing work, as discussed in Section 3.7 (Cultural Resources).
Atomic Energy Act (AEA) (42 U.S.C. Sections 2011–2259)	The AEA establishes regulatory authorities to promote the safe use of nuclear technology in civilian and defense applications. Specific regulations of the Nuclear Regulatory Commission (NRC) and Department of Energy (DOE) are discussed in subsequent rows of this table.

Table 5-1: Principal Federal and State Laws, Regulations, Executive Orders, and Policies Applicable to the Proposed Action and Alternatives (continued)

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	*Status of Compliance*
Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. Sections 668–668c)	Bald eagles may be found in the general vicinities of Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) and the Port of Benton locations; potential impacts on the species are analyzed in Section 3.5.3.3 (Alternative 2: Dual Reactor Compartment Packages). Bald eagles are known to nest near PSNS & IMF facility (see Section 3.5.2.4.1 [Puget Sound Naval Shipyard & Intermediate Maintenance Facility and Sinclair Inlet]) within approximately 400 meters of the shoreline. Bald eagles use the Columbia River and surrounding areas in the Port of Benton region, but the closest known nest is several miles downstream of the proposed barge slip modification (see Section 3.5.2.4.2 [Port of Benton Barge Slip]). The United States (U.S.) Department of the Navy (Navy) has concluded consultation with U.S. Fish and Wildlife Service (USFWS) under the BGEPA is not warranted because of there is no potential for the Proposed Action to disturb known nesting and foraging locations.
Clean Air Act (CAA) (42 U.S.C. Section 7401 et seq.)	The Proposed Action and alternatives would not exceed the *de minimis* levels for CAA conformity, as discussed in Section 3.6 (Air Quality). A Record of Non-Applicability has been prepared (see Appendix I [Air Quality Calculations and Record of Non-Applicability]) to ensure operational activities are accounted for within the currently approved State Implementation Plan.
Clean Water Act (33 U.S.C. Section 1251 et seq.)/Rivers and Harbors Act (33 U.S.C. Section 401 et seq.)	The Navy will continue to implement and comply with the requirements as outlined in 40 Code of Federal Regulations (CFR) Part 1700.
Coastal Zone Management Act (16 U.S.C. Section 1451 et seq.)	The Navy has consulted with regulatory agencies in Virginia, Texas, and Alabama. Detailed discussion of the Navy's compliance with the Coastal Zone Management Act is discussed in Section 5.3 (Coastal Zone Management Act Compliance) below.
Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. Section 9601 et seq.)	The Navy would report any spill or release of hazardous substance of a quantity equal to or greater than the reportable quantity to the U.S Environmental Protection Agency.
Dredged Material Management Requirements	Dredging of the Port of Benton barge slip would comply with all applicable requirements for the assessment, characterization, and management (disposal) of dredged material. Proper procedures would be followed for evaluating potential contaminant-related environmental impacts of dredging and upland disposal of dredged materials.
Emergency Planning and Community Right-to-Know Act (42 U.S.C. Section 11001 et seq.)	The Navy or its contractor would maintain Safety Data Sheets and inform Local Emergency Planning Committees of the Proposed Action and alternatives as required to assist them in their planning efforts.

Table 5-1: Principal Federal and State Laws, Regulations, Executive Orders, and Policies Applicable to the Proposed Action and Alternatives (continued)

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	*Status of Compliance*
Endangered Species Act (ESA) (16 U.S.C. Section 1531 et seq.)	In 2019, the National Marine Fisheries Service (NMFS) issued the Programmatic Biological and Conference Opinion on the Towing of Inactive U.S. Navy Ships from their Existing Berths to Dismantling Facilities or other Inactive Ship Site (NMFS, 2019). The Navy also consulted with USFWS for the West Indian manatee (Florida subspecies) in 2018 for towing and dismantlement activities (USFWS, 2018). In 2019, USFWS provided their concurrence that dismantling inactive ships at PSNS & IMF would not likely adversely affect the bull trout. In 2021, NMFS renewed a programmatic Biological Opinion with the Navy concerning operations and management of PSNS & IMF. The current operating permit for dry dock activities was renewed in January 2021 (NMFS, 2021). The Navy has consulted with the USFWS and NMFS in accordance with section 7 of the ESA for portions of Alternative 3 (Preferred Alternative) not covered under programmatic or previous consultations with NMFS and USFWS. Agency documentation is provided in Appendix D (Consultation Correspondence). Navy received concurrence from USFWS Alabama Ecological Services Field Office on Oct 25, 2022.
Hazardous Materials Transportation Act of 1975 (49 U.S.C. Section 5101 et seq.)	The Navy would comply with applicable requirements of the Hazardous Materials Transportation Act.
Low Level Radioactive Waste Policy Amendments Act of 1985 (42 U.S.C. Sections 2021b-j)	Commercial NRC or agreement state licensed radioactive waste sites may accept waste generated from decommissioning of ex-Enterprise.
Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (16 U.S.C. Section 1801 et seq.)	The Navy has determined that hull cleaning activities may adversely affect water and substrate quality and biogenic habitats that serve as Essential Fish Habitat (EFH) and Habitat of Particular Concern. However, these effects would be insignificant and short-term. The Navy has consulted with NMFS under Alternative 3 (Preferred Alternative) for potential impacts on EFH associated with in-water hull cleaning at Newport News Shipbuilding. NMFS concurred with the determination that the Proposed Action will not substantially adversely affect EFH. Agency documentation is provided in Appendix D (Consultation Correspondence).
Marine Mammal Protection Act (MMPA) (16 U.S.C. Section 1361 et seq.)	The Proposed Action and alternatives would not exceed thresholds established by the MMPA to consult (as discussed in Section 3.5 [Biological Resources]).
Migratory Bird Treaty Act (MBTA) (16 U.S.C. Sections 703–712)	In accordance with a directive issued by the Deputy Assistant Secretary of Defense in February 2018 (DoD, 2018)[1], the Proposed Action, including applicable standard operating procedures, minimizes take of migratory birds protected under the MBTA.

Table 5-1: Principal Federal and State Laws, Regulations, Executive Orders, and Policies Applicable to the Proposed Action and Alternatives (continued)

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	***Status of Compliance***
National Environmental Policy Act (NEPA) (42 U.S.C. Section 4321 et seq.); Council on Environmental Quality (CEQ) NEPA implementing regulations (40 CFR Parts 1500-1508); Navy procedures for Implementing NEPA (32 CFR Part 775 and Chief of Naval Operations Instruction 5090.1D)	This Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) has been prepared in accordance with NEPA, CEQ regulations, and Procedures for Implementing NEPA (32 CFR Part 775).
National Historic Preservation Act (NHPA) (54 U.S.C. Section 306108)	The analysis of activities for the Proposed Action and alternatives in this EIS/OEIS indicates that the preferred alternative does not include the type of activities with potential to affect historic properties and that Section 106 would not be required; however, if another action alternative is chosen, additional Section 106 of the NHPA reviews will be necessary as discussed in Section 3.7 (Cultural Resources) and Section 3.3 (American Indian Tribal Resources and Tribal Rights).
National Marine Sanctuaries Act (16 U.S.C. Section 1431 et seq.)	All water transit routes of the Proposed Action and alternatives specifically avoid National Marine Sanctuaries to the extent possible. The routes stay outside of the Areas to be Avoided of the Olympic Coast National Marine Sanctuary and the Florida Keys National Marine Sanctuary. No activities presented in the Proposed Action and alternatives impact National Marine Sanctuaries, as discussed in Section 3.5 (Biological Resources).
Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. Section 3001–3013)	If Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered during the implementation of the alternative chosen, work in that area will be halted so the requirements of this regulation can be followed, as discussed in Section 3.3 (American Indian Tribal Resources and Tribal Rights) and Section 3.7 (Cultural Resources).
2022–2026 Puget Sound Partnership Action Agenda (Action Agenda)	The Navy reviewed the Action Agenda and determined that neither Alternative 1 nor Alternative 2 conflict with the goals, strategies, implementing actions and considerations, program targets, or desired outcomes of the Action Agenda. The Action Agenda would not apply for Alternative 3 (Preferred Alternative).
Standards for Protection Against Radiation (10 CFR Part 20)	All alternatives would meet or exceed 10 CFR Part 20 requirements.
Packaging and Transportation of Radioactive Material (10 CFR Part 71 and 49 CFR Parts 171 to 177)	Radioactive and hazardous waste packaging and transportation would be conducted in accordance with applicable NRC and Department of Transportation regulations.
Occupational Safety and Health Act of 1970; Occupational Safety and Health Administration (OSHA)	The Navy or Contractor would be compliant with all applicable OSHA standards.

Table 5-1: Principal Federal and State Laws, Regulations, Executive Orders, and Policies Applicable to the Proposed Action and Alternatives (continued)

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	*Status of Compliance*
OSHA Regulations in 29 CFR Part 1926, Subpart P; 10 CFR Part 851; and DOE G 450.4-1C Integrated Safety Management Guide	All earthwork performed within the DOE Hanford Site shall comply with the requirements set forth in the CFR and DOE manual and requires a Hanford Site Excavation Permit. This permit would be obtained for the road grading that is part of Alternative 2.
Resource Conservation and Recovery Act (42 U.S.C. Section 6901 et seq.)	The Navy contractors would treat, store, transport, and dispose of all wastes in accordance with federal, state, and local regulations throughout the implementation of the Proposed Action and alternatives (as discussed in Section 3.2 [Hazardous and Radioactive Waste Management]).
Toxic Substances Control Act (15 U.S.C. Section 2601 et seq.)	All regulated chemicals would be used in accordance with instructions and operational constraints, as described in Section 3.2 (Hazardous and Radioactive Waste Management).
Washington State Building Code	For Alternative 2, which would include structural improvements at the Port of Benton barge slip and road grading, a geotechnical report would be prepared for the project.
Executive Orders (EOs)	
EO 11988, Floodplain Management	Dredging of the Port of Benton barge slip would reduce the amount of fill in the floodplain and it is anticipated that there would be no change in the annual flooding of the shoreline.
EO 11990, Protection of Wetlands	Dredging of the Port of Benton barge slip would not be anticipated to impact the small wetland area south of the barge slip, as flows in the main part of the Columbia River would not change, and sediment deposition along the shoreline downstream of the barge slip would continue to occur.
EO 12088, Federal Compliance with Pollution Control Standards	All necessary actions would be taken for the prevention, control, and abatement of environmental pollution. Section 1–4 of this Executive Order was revoked by EO 13148.
EO 12114, Environmental Effects Abroad of Major Federal Actions	The analysis of health-based air quality impacts under EO 12114 includes emissions estimates that involve ships outside of U.S. territorial seas.
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	The Proposed Action and alternatives would not result in any disproportionately high and adverse human health or environmental effects on minority or low-income populations.
EO 13007, Indian Sacred Sites	The Proposed Action and alternatives could result in a potential impact on an Indian sacred site, but would not limit access to Indian sacred sites by Indian religious practitioners. All of the requirements of this EO will be met, as discussed in Section 3.7 (Cultural Resources) and Section 3.3 (American Indian Tribal Resources and Tribal Rights).

Table 5-1: Principal Federal and State Laws, Regulations, Executive Orders, and Policies Applicable to the Proposed Action and Alternatives (continued)

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	*Status of Compliance*
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	The Proposed Action and alternatives would not result in disproportionate environmental health or safety risks to children, as discussed in Section 3.4 (Socioeconomics and Environmental Justice).
EOs for Invasive Species: EO 11987 – Exotic Organisms, EO 13112 – Invasive Species, EO 13751 – Safeguarding the Nation from the Impacts of Invasive Species	As part of the Proposed Action and alternatives, measures would be in place to reduce the potential for spreading invasive species and are discussed specifically in the analysis for potential impacts on biological resources under each alternative in Section 3.5 (Biological Resources). These measures primarily concern in-water hull maintenance and the potential to spread invasive species from the current mooring location to commercial shipyards and from commercial shipyards to PSNS & IMF (see Section 3.5.1.3 [Best Management Practices]).
EO 13175, Consultation and Coordination with Indian Tribal Governments	In accordance with this EO and with Navy policy, the Navy routinely consults with Indian tribal governments. The Proposed Action would not have substantial direct effects on one or more Indian tribes, on the relationship between the federal government and Indian tribes, or on the distribution of power and responsibilities between the federal government and Indian tribes, as discussed in Section 3.3 (American Indian Tribal Resources and Tribal Rights).
EO 13840, Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States	All activities associated with the Proposed Action and alternatives would be consistent with this EO.
EO 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis	The Proposed Action is consistent with the policy's goals to "empower our workers and communities; promote and protect our public health and the environment; and conserve our national treasures and monuments" (EO 13990).
EO 14008, Tackling the Climate Crisis at Home and Abroad	All activities associated with the Proposed Action and alternatives would be consistent with this EO

[1]DoD is an acronym for Department of Defense

5.3 Coastal Zone Management Act Compliance

The Coastal Zone Management Act (CZMA) of 1972 (16 United States Code Section 1451, et seq.) encourages coastal states to be proactive in managing coastal zone uses and resources. The act established a voluntary coastal planning program and requires participating states to submit a Coastal Management Plan to the National Oceanic and Atmospheric Administration for approval. Under the act, federal actions that have an effect on a coastal use or resource are required to be consistent, to the maximum extent practicable, with the enforceable policies of federally approved Coastal Management Plans.

The CZMA defines the coastal zone as extending "to the outer limit of state title and ownership under the Submerged Lands Act" (i.e., 3 nautical miles or 9 nautical miles from the shoreline, depending on the location). The coastal zone extends inland only to the extent necessary to control the shoreline.

A consistency determination, a negative determination, or a *de minimis* exemption may be submitted for review of federal agency activities. A federal agency submits a consistency determination when it determines that its activity may have either a direct or an indirect effect on a state coastal use or resource. In accordance with 15 CFR Part 930.39, the consistency determination includes a brief statement indicating whether the proposed activity will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the management program. The consistency determination must be based on evaluation of the relevant enforceable policies of the management program. In accordance with 15 CFR Part 930.35, "if a Federal agency determines that there will not be coastal effects, then the Federal agency shall provide the State agencies with a negative determination for a Federal agency activity: (1) Identified by a state agency on its list, as described in section 930.34(b), or through case-by-case monitoring of unlisted activities; or (2) Which is the same as or is similar to activities for which consistency determinations have been prepared in the past; or (3) For which the Federal agency undertook a thorough consistency assessment and developed initial findings on the coastal effects of the activity." Thus, a negative determination must be submitted to a state if the agency determines no coastal effects and one or more of the triggers above is met.

De minimis exemptions are activities proposed by the federal agency that have already been reviewed and approved by the state (after allowing for public review and comment), and those that the state has recognized as having insignificant direct or indirect (secondary or cumulative) effects on its coastal resources.

5.3.1 Coastal Management Program

The Region of Influence for Alternative 3 (Preferred Alterative) includes Virginia, Texas, and Alabama. The following provides a brief description of the regulating agency and coastal management program in each state.

Virginia

The Virginia Coastal Zone Management Program was created in 1986 pursuant to the CZMA with the purpose of protecting Virginia's designated coastal resources. The Virginia Department of Environmental Quality is the lead agency responsible for coordinating federal consistency determinations and is overseen by the National Oceanic and Atmospheric Administration Office for Coastal Management for compliance. Virginia's Coastal Management Area includes most of Tidewater Virginia, the coastal waters of the U.S. territorial area extending to Virginia sovereign limits, four tidal rivers, and watersheds including Virginia's Atlantic Coast, Chesapeake Bay, and Albemarle-Pamlico Sound. The Virginia Coastal Zone Management Program enforces preestablished policies for projects regarding various land and water use types and their corresponding possible sources of pollution.

The Navy has determined that the towing of inactive Navy ships would have no effect on any coastal use or resource in the Virginia state coastal zone. Therefore, the Navy sent a General Negative Determination to the Virginia Department of Environmental Quality in October 2022 for the towing of Navy inactive ships. In November 2022, the Virginia Department of Environmental Quality concurred with the Navy's General Negative Determination. Appendix D (Consultation Correspondence) provides this documentation.

If the Navy is required to clean the hull of ex-Enterprise prior to initial transport, and if the implementation of hull-cleaning mitigation measures within dry dock is not feasible, the Navy would conduct hull cleaning at the current mooring location in water (Newport News Shipbuilding, Virginia) or at a nearby facility within the Hampton Roads Metropolitan Area, Virginia. The Navy underwater hull

cleaning activities meet the requirements of the Clean Water Act under the Uniform National Discharge Standards (UNDS) Program for Phase II Batch Two Discharges. The Navy submitted a National Consistency Determination to 35 states (including Virginia) for UNDS Program Phase II Batch Two Discharges, which include underwater ship husbandry discharges that occur during the inspection, maintenance, cleaning, and repair of hulls and hull appendages while a vessel is waterborne. In response, Virginia provided concurrence that UNDS Phase II Batch Two discharges are consistent to the maximum extent practicable with the enforceable policies of the Virginia coastal management program.

Texas

Under the standards created by the CZMA to preserve, protect, restore, and enhance the nation's coastal resources, the Texas Coastal Management Program was established with the purpose of developing a comprehensive approach to manage coastal natural resources in Texas. The Texas Coastal Management Program aims to improve coastal management practices that align with the long-term ecological and economic productivity of coastal resources. The Texas General Land Office is responsible for carrying out the program and has established enhancement areas along the coast of Texas that include wetlands, ocean resources, and many others. The enhancement areas undergo prioritization with the highest-ranking areas, driving program needs and direction of management efforts in coordination with the Office for Coastal Management.

The Navy has determined that the towing of inactive Navy ships would have no effect on any coastal use or resource in the Texas state coastal zone. The Navy previously consulted with the Texas Coastal Resources Program on the general action of towing one or more inactive ships in the Texas coastal zone, and obtained concurrence from the Texas Coastal Resources Program this action would have no effect. Therefore, no additional CZMA consultation with Texas is required.

Alabama

The Alabama Department of Conservation and Natural Resources, State Lands Division, Coastal Section oversees the Alabama Coastal Management Program with the intent of preserving coastal resources for future generations while allowing for economic growth. This program was developed in accord with the federal rules and regulations set forth by the CZMA in order to manage land and water activities within Alabama's Coastal Area. Alabama's Coastal Area lies between the continuous 10-foot contour that extends in Baldwin and Mobile counties following seaward to the outer limits of the U.S. territorial sea. The Alabama Department of Conservation and Natural Resources is the lead agency responsible for planning, fiscal management, and education outreach of public information, while the Alabama Department of Environmental Management oversees regulatory, permitting, monitoring and enforcement of the program.

The Navy has determined that the towing of inactive Navy ships would have no effect on any coastal use or resource in the Alabama state coastal zone. Therefore, the Navy sent a General Negative Determination to the Alabama Department of Environmental Management for the towing of Navy inactive ships. In October 2022, the Alabama Department of Environmental Management concurred with the Navy's General Negative Determination. Appendix D (Consultation Correspondence) provides this documentation.

5.4 Relationship Between Short-Term Use of the Environment and Maintenance and Enhancement of Long-Term Productivity

In accordance with the CEQ regulations (40 CFR Part 1502), this EIS/OEIS analyzes the relationship between the short-term impacts on the environment and the effects those impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment.

The Proposed Action and alternatives would be categorized as having both short- and long-term impacts. For example, shipment of waste generated from the Proposed Action on highways would result in short-term and minimal impacts on air quality consistent with existing use of highways. All radioactive wastes decay over time, resulting in the need to implement long-term protections from radiation. The waste disposal facilities authorized to receive waste generate as part of the Proposed Action are required to demonstrate continued protection of the public and the environment associated with radioactive waste disposal. The analysis in this document has found that these activities would not greatly impact resources, and therefore are not expected to result in any impacts that would reduce environmental productivity; permanently narrow the range of beneficial uses of the environment; or pose long-term risks to health, safety, or general welfare of the public.

5.5 Irreversible or Irretrievable Commitment of Resources

NEPA requires that environmental analysis include identification of "any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented" (42 United States Code Section 4332). Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy or 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., building demolition, the disturbance of a cultural site).

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Implementation of the Proposed Action and alternatives would involve human labor; the consumption of fuel, oil, and lubricants for construction vehicles; and loss of natural resources. Most impacts would be short term and temporary or, if long lasting, would be negligible. Therefore, implementation of the Proposed Action and alternatives would not result in major irreversible or irretrievable commitment of resources.

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6 List of Preparers

There are no references in this chapter.

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Environmental Impact Statement/ Overseas Environmental Impact Statement

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants

TABLE OF CONTENTS

APPENDIX A FEDERAL REGISTER NOTICES A-1

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Appendix A Federal Register Notices

Appendix A contains the following Federal Register Notices:

1. Notice of Intent to Prepare an Environmental Impact Statement/Overseas Environmental Impact Statement for Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants and To Announce Public Scoping Meetings (Federal Register Doc. 2019-11221)
2. Notice of Availability and Notice of Virtual Public Meetings for Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft Environmental Impact Statement/Overseas Environmental Impact Statement (Federal Register Doc. 2022-17502)

Federal Register / Vol. 84, No. 105 / Friday, May 31, 2019 / Notices 25243

CONTRACTS BRANCH

Michael R. Jurkowski,

Deputy Director, Business & PL Operations.

[FR Doc. 2019–11404 Filed 5–30–19; 8:45 am]

BILLING CODE 5353–01–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Intent To Prepare an Environmental Impact Statement/ Overseas Environmental Impact Statement for Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants and To Announce Public Scoping Meetings

AGENCY: Department of the Navy, DoD

ACTION: Notice.

SUMMARY: Pursuant to Section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality, and Presidential Executive Order 12114, the Department of the Navy (DON) announces its intent to prepare an Environmental Impact Statement/ Overseas Environmental Impact Statement (EIS/OEIS) to evaluate the potential environmental impacts associated with the disposal of the decommissioned, defueled ex-Enterprise (CVN 65), including its associated reactor plants. The proposed action executes the Chief of Naval Operations (CNO) policy for inactive ships stricken from the Naval Vessel Register and designated for disposal by dismantling in order to reduce the Navy's inactive ship inventory and eliminate costs associated with maintaining the ship in a safe stowage condition.

DATES: The 45-day public scoping period begins May 31, 2019 and ends July 15, 2019. Public scoping meetings will be held on June 18, 20, 25, and 27, 2019. All public comments are due by July 15, 2019.

ADDRESSES: The public scoping meetings will be held at the following locations (all times local):

1. June 18, 2019, 5:00 p.m. to 8:00 p.m., Denbigh Community Center, 15198 Warwick Boulevard, Newport News, VA 23608–2631.
2. June 20, 2019, 5:00 p.m. to 8:00 p.m., Fort Brown Memorial Center, 600 International Boulevard, Brownsville, TX 78520–5738.
3. June 25, 2019, 5:00 p.m. to 8:00 p.m., Mountain View Middle School, 2400 Perry Avenue, Bremerton, WA 98310–5139.
4. June 27, 2019, 5:00 p.m. to 8:00 p.m., Richland Public Library, 955 Northgate Drive, Richland, WA 99352–3505.

Comments may be provided at the public scoping meetings, by mail, and through the project website at: *https://www.CarrierDisposalEIS.com*. Mailed comments must be postmarked no later than July 15, 2019 and mailed to the address: Puget Sound Naval Shipyard and Intermediate Maintenance Facility, 1400 Farragut Avenue, Bremerton, WA 98314–5001, Attn: Kellie M. Randall, Public Affairs Officer, CVN65 EIS, for consideration in the Draft EIS/OEIS preparation. The DON is requesting public comments on the scope of the analysis, including potential environmental issues and viable alternatives to be considered during the development of the Draft EIS/OEIS.

The scoping meetings will consist of an informal, open house session with informational poster stations staffed by DON representatives. Meeting details will be announced in local area newspapers. Additional information on the public scoping meetings and comment submittal will be available on the project website at: *https://www.CarrierDisposalEIS.com*.

FOR FURTHER INFORMATION CONTACT: Puget Sound Naval Shipyard and Intermediate Maintenance Facility, 1400 Farragut Avenue, Bremerton, WA 98314–5001, Attn: Kellie M. Randall, Public Affairs Officer, CVN65 EIS, 360–476–7111, or project website: *https://www.CarrierDisposalEIS.com*.

SUPPLEMENTARY INFORMATION: The DON's action proponent is the Director, Naval Nuclear Propulsion (CNO N00N). The Department of Energy (DOE) is a cooperating agency in the preparation of the EIS/OEIS. The proposed action is to dispose of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier, including its reactor plants. The proposed action would entail dismantling and recycling the non-radioactive hull sections of the ex-Enterprise at a designated facility in accordance with applicable Federal, state and local laws, and the removal and packaging of the ex-Enterprise reactor plants for transportation and disposal as low-level radioactive waste to authorized radioactive waste burial ground(s). The removal of nuclear fuel from the ex-Enterprise reactor plants has already taken place and is not part of the proposed action. The disposal of the ex-Enterprise is needed to comply with CNO policy for inactive ships stricken from the Naval Vessel Register and with the Naval Nuclear Propulsion Program's statutory responsibilities under 50 U.S.C. 2406 and 2511. The purpose of the proposed action is to reduce the U.S. Navy inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and to dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the United States Navy.

The DON, in coordination with the DOE as a cooperating agency, prepared a Final Environmental Assessment (EA) entitled, "Disposal of Decommissioned, Defueled Naval Reactor Plants from USS ENTERPRISE (CVN 65)" dated August 2012. In the Finding of No Significant Impact, the Navy decided to remove the reactor compartments from ex-Enterprise at Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF), prepare the reactor compartments for disposal as reactor compartment packages, recycle non-radioactive hull sections, and transport the reactor compartment packages for disposal at the DOE Hanford Site near Richland, Washington. The DON has since identified new preliminary alternatives that could address the disposal of the ex-Enterprise.

DON is preparing this EIS/OEIS to consider these preliminary alternatives and potentially others that may be identified during the EIS/OEIS scoping process. The DON is considering the following preliminary alternatives to satisfy the purpose and need:

Alternative 1—Partial dismantlement of ex-Enterprise at an authorized commercial dismantlement facility by removing areas of the ship outside the naval reactor compartments. The remainder of the ship containing the naval reactor compartments would then be transported to PSNS & IMF to prepare eight single reactor compartment packages for disposal at DOE Hanford Trench 94. This alternative is an extension of the reactor plant disposal program at PSNS & IMF as discussed in the 2012 EA.

Alternative 2—Partial dismantlement of ex-Enterprise at an authorized commercial dismantlement facility by removing areas of the ship outside the naval reactor compartments. The remainder of the ship containing the naval reactor compartments would then be transported to PSNS & IMF to prepare four reactor compartment packages for disposal at DOE Hanford Trench 94. Each package would contain two of the ship's eight reactor plants.

Alternative 3—Dismantlement of the ex-Enterprise at an authorized commercial dismantlement facility, including cutting apart the eight reactor

plants into segments for packaging into several hundred small containers that meet Department of Transportation requirements for subsequent disposal at either a DOE and/or commercial low-level radioactive waste facility.

Alternative 4—No action. Under the no action alternative, the defueled ex-Enterprise would be stored waterborne. The vessel would require periodic maintenance to ensure that storage continues in a safe and environmentally responsible manner.

DON will evaluate the potential environmental impacts from the no action alternative and identified action alternatives. DON will analyze potential impacts on environmental resources resulting from activities included in identified alternatives in accordance with 40 CFR 1502.16. Direct, indirect, and cumulative impacts will be analyzed.

Ship dismantlement activities will be performed in accordance with all applicable Federal, state, and local environmental laws and regulations, occupational safety and health laws and regulations, and in accordance with the Naval Nuclear Propulsion Program's statutory responsibilities under 50 U.S.C. 2406 and 2511.

The scoping process is helpful in identifying public concerns and local issues to be considered during the development of the EIS/OEIS. Federal, state, and local agencies; federally recognized tribes; non-governmental organizations; and interested persons are encouraged to provide substantive comments to the DON on potential impacts to environmental resources. All substantive comments provided orally, electronically, or in writing at the scoping meetings, submitted via the project website, or mailed to the address provided in the **FOR FURTHER INFORMATION CONTACT** section will be taken into consideration during the development of the EIS/OEIS.

Dated: May 23, 2019.

M.S. Werner,

Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2019–11221 Filed 5–30–19; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF EDUCATION

Federal Need Analysis Methodology for the 2020–21 Award Year—Federal Pell Grant, Federal Work-Study, Federal Supplemental Educational Opportunity Grant, William D. Ford Federal Direct Loan, Iraq and Afghanistan Service Grant, and TEACH Grant Programs

AGENCY: Federal Student Aid, Department of Education.

ACTION: Notice.

SUMMARY: The Secretary announces the annual updates to the tables used in the statutory Federal Need Analysis Methodology that determines a student's expected family contribution (EFC) for award year (AY) 2020–21 for student financial aid programs, Catalog of Federal Domestic Assistance (CFDA) Numbers 84.063, 84.033, 84.007, 84.268, 84.408, and 84.379. The intent of this notice is to alert the financial aid community and the broader public to these required annual updates used in the determination of student aid eligibility.

FOR FURTHER INFORMATION CONTACT: Marya Dennis, U.S. Department of Education, Room 63G2, Union Center Plaza, 830 First Street NE, Washington, DC 20202–5454. Telephone: (202) 377–3385.

If you use a telecommunications device for the deaf (TDD) or a text telephone (TTY), call the Federal Relay Service (FRS), toll free, at 1–800–877–8339.

SUPPLEMENTARY INFORMATION: Part F of title IV of the Higher Education Act of 1965, as amended (HEA), specifies the criteria, data elements, calculations, and tables the Department of Education (Department) uses in the Federal Need Analysis Methodology to determine the EFC.

Section 478 of the HEA requires the Secretary to annually update the following four tables for price inflation—the Income Protection Allowance (IPA), the Adjusted Net Worth (NW) of a Business or Farm, the Education Savings and Asset Protection Allowance, and the Assessment Schedules and Rates. The updates are based, in general, upon increases in the Consumer Price Index (CPI).

For AY 2020–21, the Secretary is charged with updating the IPA for parents of dependent students, adjusted NW of a business or farm, the education savings and asset protection allowance, and the assessment schedules and rates to account for inflation that took place between December 2018 and December 2019. However, because the Secretary must publish these tables before December 2019, the increases in the tables must be based on a percentage equal to the estimated percentage increase in the Consumer Price Index for All Urban Consumers (CPI–U) for 2019. The Secretary must also account for any under- or over-estimation of inflation for the preceding year.

In developing the table values for the 2019–20 AY, the Secretary assumed a 1.6 percent increase in the CPI–U for the period December 2017 through December 2018. The actual inflation for this time period was 1.9 percent. The Secretary estimates that the increase in the CPI–U for the period December 2018 through December 2019 will be 2.4 percent.

Additionally, section 601 of the College Cost Reduction and Access Act of 2007 (CCRAA, Pub. L. 110–84) amended sections 475 through 478 of the HEA affecting the IPA tables for the 2009–10 through 2012–13 AYs and required the Department to use a percentage of the estimated CPI to update the table in subsequent years. These changes to the IPA impact dependent students, as well as independent students with dependents other than a spouse and independent students without dependents other than a spouse. This notice includes the new 2020–21 AY values for the IPA tables, which reflect the CCRAA amendments. The updated tables are in sections 1 (Income Protection Allowance), 2 (Adjusted Net Worth of a Business or Farm), and 4 (Assessment Schedules and Rates) of this notice.

Under section 478(d) of the HEA, the Secretary must also revise the education savings and asset protection allowances for each AY. The Education Savings and Asset Protection Allowance table for AY 2020–21 has been updated in section 3 of this notice.

Section 478(h) of the HEA also requires the Secretary to increase the amount specified for the employment expense allowance, adjusted for inflation. This calculation is based on increases in the Bureau of Labor Statistics' marginal costs budget for a two-worker family compared to a one-worker family. The items covered by this calculation are: Food away from home, apparel, transportation, and household furnishings and operations. The Employment Expense Allowance table for AY 2020–21 has been updated in section 5 of this notice.

Section 478(g) of the HEA directs the Secretary to update the tables for State and other taxes after reviewing the Statistics of Income file data maintained by the Internal Revenue Service. This

in case of primary system technical difficulties.

Adriane Paris,
Air Force Federal Register Liaison Officer.

[FR Doc. 2022–17673 Filed 8–18–22; 8:45 am]
BILLING CODE 5001–10–P

DEPARTMENT OF DEFENSE

Office of the Secretary

Board of Regents, Uniformed Services University of the Health Sciences; Notice of Federal Advisory Committee Meeting

AGENCY: Under Secretary of Defense for Personnel and Readiness (USD(P&R)), Department of Defense (DoD).

ACTION: Notice of Federal Advisory Committee meeting.

SUMMARY: The DoD is publishing this notice to announce that the following Federal Advisory Committee meeting of the Board of Regents, Uniformed Services University of the Health Sciences (BoR USUHS) will take place.

DATES: Tuesday, August 23, 2022, open to the public from 12 p.m. to 4 p.m.

ADDRESSES: Uniformed Services University of the Health Sciences, 4301 Jones Bridge Road, Bethesda, MD 20814. The meeting will be held both in-person and virtually. To participate in the meeting, see the Meeting Accessibility section for instructions.

FOR FURTHER INFORMATION CONTACT: Annette Askins-Roberts, Designated Federal Officer (DFO), at (301) 295–3066 or *annette.askins-roberts@usuhs.edu*. Mailing address is 4301 Jones Bridge Road, Bethesda, MD 20814. website: *https://www.usuhs.edu/ao/board-of-regents*.

SUPPLEMENTARY INFORMATION: Due to circumstances beyond the control of the Designated Federal Officer, the Board of Regents, Uniformed Services University of the Health Sciences was unable to provide public notification required by 41 CFR 102–3.150(a) concerning its August 23, 2022 meeting. Accordingly, the Advisory Committee Management Officer for the Department of Defense, pursuant to 41 CFR 102–3.150(b), waives the 15-calendar day notification requirement. This meeting is being held under the provisions of the Federal Advisory Committee Act (FACA) (5 U.S.C., Appendix), the Government in the Sunshine Act (5 U.S.C. 552b), and 41 CFR 102–3.140 and 102–3.150.

Purpose of the Meeting: The purpose of the meeting is to provide advice and recommendations to the Secretary of Defense, through the USD(P&R), on academic and administrative matters critical to the full accreditation and successful operation of Uniformed Services University (USU). These actions are necessary for USU to pursue its mission, which is to educate, train and comprehensively prepare uniformed services health professionals, officers, scientists, and leaders to support the Military and Public Health Systems, the National Security and National Defense Strategies of the United States, and the readiness of our Uniformed Services.

Agenda: The schedule includes opening comments from the Chair; a report by the USU President on recent actions affecting academic and operational aspects of USU; and reports from the School of Medicine, Graduate School of Nursing, Postgraduate Dental College, College of Allied Health Sciences, and the Assistant Vice President for Accreditation.

Meeting Accessibility: Pursuant to Federal statutes and regulations (5 U.S.C., Appendix, 5 U.S.C. 552b, and 41 CFR 102–3.140 through 102–3.165), the meeting will be held in-person and virtually and is open to the public from 12 p.m. to 4 p.m. Seating is on a first-come basis. Members of the public wishing to attend the meeting in person or virtually should contact Ms. Askins-Roberts no later than Monday, August 22, 2022 at 12 p.m. at the address and phone number noted in the **FOR FURTHER INFORMATION CONTACT** section.

Written Statements: Pursuant to section 10(a)(3) of the FACA and 41 CFR 102–3.140, the public or interested organizations may submit written comments to the BoR USUHS about its approved agenda pertaining to this meeting or at any time regarding the BoR USUHS' mission. Individuals submitting a written statement must submit their statement to Ms. Askins-Roberts at the address noted in the **FOR FURTHER INFORMATION CONTACT** section. Written statements that do not pertain to a scheduled meeting of the BoR USUHS may be submitted at any time. If individual comments pertain to a specific topic being discussed at the planned meeting, then these statements must be received at least 4 calendar days prior to the meeting. Otherwise, the comments may not be provided to or considered by the BoR USUHS until a later date. The DFO will compile all timely submissions with the BoR USUHS' Chair and ensure such submissions are provided to BoR USUHS members before the meeting.

Dated: August 16, 2022.
Aaron T. Siegel,
Alternate OSD Federal Register Liaison Officer, Department of Defense.

[FR Doc. 2022–17893 Filed 8–18–22; 8:45 am]
BILLING CODE 5001–06–P

DEPARTMENT OF DEFENSE

Office of the Secretary

[Docket ID: DoD–2022–OS–0098]

Proposed Collection; Comment Request

Correction

In notice document 2022–16970, appearing on page 48166, in the Issue of Monday, August 8, 2022, make the following correction.

- On page 48166, in the second column, in the "**DATES**" section, in the second line, "October 4, 2022" should read "October 7, 2022".

[FR Doc. C1–2022–16970 Filed 8–17–22; 2:00 pm]
BILLING CODE 0099–10–D

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Availability and Notice of Virtual Public Meetings for Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft Environmental Impact Statement/ Overseas Environmental Impact Statement

AGENCY: Department of the Navy (DoN), Department of Defense (DoD).

ACTION: Notice.

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality implementing regulations and a Presidential Executive Order, DoN, with United States (U.S.) Department of Energy (DOE) as a cooperating agency, has prepared and filed with U.S. Environmental Protection Agency (EPA) a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants. The Draft EIS/OEIS includes an analysis of the potential environmental impacts associated with alternatives for the disposal of ex-Enterprise, including its defueled reactor plants. The Proposed Action executes the statutory responsibilities of the Naval Nuclear Propulsion Program (NNPP) and Chief

of Naval Operations (CNO) policy for inactive ships stricken from the Naval Vessel Register and designated for disposal by dismantling in order to reduce DoN inactive ship inventory and eliminate costs associated with maintaining the ship in a safe stowage condition.

DATES: The 45-day public comment period begins August 19, 2022, and ends October 3, 2022. Virtual public meetings will be held on September 20 and September 22, 2022 to provide an overview of the Draft EIS/OEIS and to answer questions from the public. All public comments on the Draft EIS/OEIS are due by the end of the day on October 3, 2022.

Two virtual public meetings will be held as follows:

1. September 20, 2022, from 4 to 5 p.m. CDT;

2. September 22, 2022, from 4 to 5 p.m. CDT.

Questions concerning the Draft EIS/OEIS for discussion with DoN representatives at the virtual public meetings can be submitted between September 12 and September 21.

ADDRESSES: Email questions for the virtual public meetings to: *info@carrierdisposaleis.com* or complete the form at: *http://www.carrierdisposaleis.com.*

Comments on the Draft EIS/OEIS may be provided by mail and through the project website at: *http://www.carrierdisposaleis.com.* Mailed comments must be postmarked no later than October 3, 2022, and mailed to: Office of Congressional and Public Affairs; Attn. Ex-Enterprise CVN 65 Draft EIS/OEIS; Puget Sound Naval Shipyard & Intermediate Maintenance Facility; 1400 Farragut Ave., Stop 2072; Bremerton, WA 98314–2072 for consideration in the preparation of the Final EIS/OEIS.

DoN distributed the Draft EIS/OEIS to government agencies with which DoN is consulting and to federally recognized tribes and other stakeholders. The Draft EIS/OEIS is available for public review on the project website at *http://www.carrierdisposaleis.com* and at these public libraries:

1. Kitsap Regional Library, Downtown Bremerton Branch, 612 Fifth St., Bremerton, WA 98337.

2. Richland Public Library, 955 Northgate Dr., Richland, WA 99352.

3. Hampton Public Library, 4207 Victoria Blvd., Hampton, VA 23669.

4. Brownsville Public Library, Main Branch, 2600 Central Blvd., Brownsville, TX 78520.

5. Brownsville Public Library, Southmost Branch, 4320 Southmost Blvd., Brownsville, TX 78521.

6. Ben May Main Library, 701 Government St., Mobile, AL 36602.

Additional information on the virtual public meetings and comment submittal will be available on the project website at: *http://www.carrierdisposaleis.com/vpm.* An audio-only option will also be available.

FOR FURTHER INFORMATION CONTACT: For further information, contact Anna Taylor, Office of Congressional and Public Affairs; Attn. Ex-Enterprise CVN 65 Draft EIS/OEIS; Puget Sound Naval Shipyard & Intermediate Maintenance Facility; 1400 Farragut Ave., Stop 2072; Bremerton, WA 98314–2072, 360–476–7111, or project website: *http://www.carrierdisposaleis.com.*

SUPPLEMENTARY INFORMATION: This draft Environmental Impact Statement was prepared and filed with the EPA pursuant to the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality implementing regulations and a Presidential Executive Order 12114. DoN, with United States (U.S.) Department of Energy (DOE) as a cooperating agency.

DoN action proponent is the Director, Naval Nuclear Propulsion (CNO N00N). The purpose of the Proposed Action is to reduce DoN inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting operational needs of DoN.

DoN is considering the following alternatives to satisfy the purpose of and need for the Proposed Action:

Alternative 1—Single Reactor Compartment Packages: This alternative involves the partial dismantlement and removal of non-radiological portions of ex-Enterprise at a commercial dismantlement facility. The remainder, including the defueled reactor plants, would be transported around South America by heavy-lift ship to Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) for recycling and construction of eight single reactor compartment packages. The reactor compartment packages would be shipped by barge to the Port of Benton near the DOE Hanford Site and by high-capacity transporter to the DOE Hanford Site for disposal.

Alternative 2—Dual Reactor Compartment Packages: This alternative is the same as Alternative 1, except four dual reactor compartment packages would be constructed rather than eight single reactor compartment packages. The packages would be heavier and larger than reactor compartment packages currently transported to the DOE Hanford Site under the existing DoN program, and this alternative would require modifications to the Port of Benton barge slip and roadway to the DOE Hanford Site.

Alternative 3—Commercial Dismantlement: Under this alternative, DoN would contract with commercial industry to dismantle ex-Enterprise, including its defueled reactor plants, and dispose of the reactor plant waste at authorized facilities. DoN analyzed environmental impacts associated with three locations for commercial dismantlement: the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; and Mobile, Alabama.

DoN also evaluated the No Action Alternative, which includes waterborne storage of ex-Enterprise and periodic maintenance to ensure storage continues in a safe and environmentally responsible manner.

DoN evaluated the potential impacts on environmental resources resulting from activities included in the three action alternatives and the No Action Alternative in accordance with 40 Code of Federal Regulations § 1502.16. Direct, indirect, and cumulative impacts were analyzed. DoN does not anticipate significant environmental impacts resulting from the proposed alternatives with the implementation of best management practices and mitigation measures.

DoN identified Alternative 3—Commercial Dismantlement as its preferred alternative because it would keep the specially qualified and trained PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivation and reactor compartment package work that are already part of the PSNS & IMF workload, would provide cost benefits to the U.S. taxpayer, would be completed in the shortest duration, and would not result in significant environmental impacts. The preferred alternative does not result in any decrease in workforce at PSNS & IMF.

DoN will hold virtual public meetings to discuss the Proposed Action, alternatives, and the draft environmental impact analysis, and to answer questions from the public. DoN has assessed that virtual public meetings are the best format to meet statutory requirements under NEPA while mitigating COVID–19 risks.

The public involvement process is helpful in identifying public concerns and local issues to be considered during the development of the EIS/OEIS and assessing the accuracy and adequacy of the environmental impact analysis.

Federal, state, and local agencies; federally recognized tribes and tribal groups; nongovernmental organizations; and interested persons are encouraged to provide comments to DoN that are substantive to the analysis of potential impacts on environmental resources. All comments provided electronically via the project website or mailed to the address provided in the **ADDRESSES** section will be taken into consideration during the development of the Final EIS/OEIS.

Dated: August 10, 2022.

J. M. Pike,

Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2022–17502 Filed 8–18–22; 8:45 am]

BILLING CODE P

DEPARTMENT OF EDUCATION

Applications for New Awards; Lead of a Career and Technical Education (CTE) Network: Research Networks Focused on Critical Problems of Education Policy and Practice Program

AGENCY: Institute of Education Sciences, Department of Education.

ACTION: Notice.

SUMMARY: The Department of Education (Department) is issuing a notice inviting applications for the Lead of a Career and Technical Education (CTE) Network under the fiscal year (FY) 2023 Research Networks Focused on Critical Problems of Education Policy and Practice Grant Program, Assistance Listing Number (ALN) 84.305N. This notice relates to the approved information collection under OMB control number 4040–0001.

DATES:

Applications Available: October 20, 2022.

Deadline for Transmittal of Applications: February 23, 2023.

ADDRESSES: For the addresses for obtaining and submitting an application, please refer to our Common Instructions for Applicants to Department of Education Discretionary Grant Programs, published in the **Federal Register** on December 27, 2021 (86 FR 73264) and available at *www.federalregister.gov/d/2021-27979*. Please note that these Common Instructions supersede the version published on February 13, 2019, and, in part, describe the transition from the requirement to register in *SAM.gov* a Data Universal Numbering System (DUNS) number to the implementation of the Unique Entity Identifier (UEI). More information on the phase-out of DUNS numbers is available at *https://www2.ed.gov/about/offices/list/ofo/docs/unique-entity-identifier-transition-fact-sheet.pdf*.

FOR FURTHER INFORMATION CONTACT: Dr. Corinne Alfeld, Institute of Education Sciences, U.S. Department of Education, Potomac Center Plaza, 550 12th Street SW, Washington, DC 20202. Email: *Corinne.Alfeld@ed.gov*. Telephone: (202) 245–8203.

If you are deaf, hard of hearing, or have a speech disability and wish to access telecommunications relay services, please dial 7–1–1.

SUPPLEMENTARY INFORMATION:

Full Text of Announcement

I. Funding Opportunity Description

Purpose of Program: Through the National Center for Education Research (NCER), the Institute of Education Sciences (IES) provides support for programs of research in areas of demonstrated national need. The IES research grant programs are designed to provide interested individuals and the general public with reliable and valid information about education practices that support learning and improve academic achievement and access to education opportunities for all learners.

Through the Research Networks Focused on Critical Problems of Education Policy and Practice grant program, NCER focuses resources and attention on specific education problems or issues that are a high priority for the Nation. NCER also establishes both a structure and process for researchers who are working on these issues to share ideas, build new knowledge, and strengthen their research and dissemination capacity.

Under this notice, NCER is inviting only applications that address the following topic:

- Career and Technical Education Research Network, Network Lead role only. The CTE Network will conduct research on CTE through projects funded by other IES grant competitions.

This notice provides information about the Career and Technical Education Research Network. Requirements for applications for the Digital Learning Platforms Network are in the notice inviting applications for new awards under the Research Networks Focused on Critical Problems of Education Policy and Practice and Special Education Research and Development Center programs, published elsewhere in this issue of the **Federal Register**.

Exemption from Proposed Rulemaking: Under section 191 of the Education Sciences Reform Act, *20 U.S.C. 9581*, IES is not subject to section 437(d) of the General Education Provisions Act, *20 U.S.C. 1232(d)*, and is therefore not required to offer interested parties the opportunity to comment on matters relating to grants.

Program Authority: 20 U.S.C. 2324(c)(1); 20 U.S.C. 9501 *et seq.*

Note: Projects will be awarded and must be operated in a manner consistent with the nondiscrimination requirements contained in Federal civil rights laws.

Applicable Regulations: (a) The Education Department General Administrative Regulations in 34 CFR parts 77, 81, 82, 84, 86, 97, 98, and 99. In addition, the regulations in 34 CFR part 75 are applicable, except for the provisions in 34 CFR 75.100, 75.101(b), 75.102, 75.103, 75.105, 75.109(a), 75.200, 75.201, 75.209, 75.210, 75.211, 75.217(a)–(c), 75.219, 75.220, 75.221, 75.222, 75.230, 75.250(a), and 75.708. (b) The Office of Management and Budget Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement) in 2 CFR part 180, as adopted and amended as regulations of the Department in 2 CFR part 3485. (c) The Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards in 2 CFR part 200, as adopted and amended as regulations of the Department in 2 CFR part 3474.

Note: The regulations in 34 CFR part 86 apply to institutions of higher education only.

Note: The open licensing requirement in 2 CFR 3474.20 does not apply to this competition.

II. Award Information

Types of Awards: Discretionary grants and cooperative agreements.

Fiscal Information: Although Congress has not yet enacted an appropriation for FY 2023, IES is inviting applications for this competition now so that applicants can have adequate time to prepare their applications. The actual level of funding, if any, depends on final congressional action.

Estimated Range of Awards: $500,000 to $750,000. The size of the award will depend on the scope of the project proposed and the amount of available funds.

Estimated Number of Awards: IES intends to fund one Network Lead.

Note: The Department is not bound by any estimates in this notice.

Project Period: Up to 60 months.

III. Eligibility Information

1. *Eligible Applicants:* Institutions of higher education, public and or private non-profit organizations and or

Environmental Impact Statement/ Overseas Environmental Impact Statement

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants

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Appendix B Public Involvement and Distribution

This appendix includes descriptions of United States (U.S.) Navy (Navy) efforts to involve the public in preparing the Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants. The Department of Energy (DOE) is a cooperating agency on the EIS/OEIS.

B.1 Project Website

A project website was established to provide the public with project, virtual public meeting, and commenting information, and to accept comments electronically. The project website address is www.carrierdisposaleis.com, and was made available to the public on May 31, 2019. The project website was updated for the Draft EIS/OEIS release, and changes went live August 18, 2022. The website address was included in all public notifications.

Public notifications, the fact sheet booklet, posters, frequently asked questions, and references are available on the project website. Spanish versions of notices and informational materials are also posted on the website.

B.2 Scoping Periods

Scoping is an early and open process for developing the "scope" of issues to be addressed in an EIS and for identifying significant issues related to a proposed action. The purpose of public involvement and outreach during the public scoping period of the EIS/OEIS is to (1) notify and inform the public, stakeholders, and federally recognized Native American tribes ("federally recognized tribes") about the release of the Proposed Action and the Navy's intent to prepare an EIS/OEIS; and (2) provide the opportunity for the public, stakeholders, and federally recognized tribes to submit comments to inform the scope of the project and the environmental analysis.

In an effort to maximize public participation and ensure public input is considered, the Navy conducted public scoping for this EIS/OEIS. In 2019, the initial public scoping phase began with the publication of a Notice of Intent in the *Federal Register* (FR) (84 FR 25243) on May 31, 2019. The Notice of Intent announced the public scoping period and the dates, times, and locations of public scoping meetings. The FR notice can be found in Appendix A (Federal Register Notices). The scoping period ran for 45 days from May 31, 2019, through July 15, 2019.

As a result of comments received during public scoping conducted in 2019, the Navy reopened the public scoping period and added Mobile, Alabama to the Study Area as an additional location for consideration as an alternative. In compliance with National Environmental Policy Act (NEPA), the Navy held an additional public scoping period to solicit comments from federal, state, and local agencies; federally recognized tribes; nongovernmental organizations; and interested persons from August 12, 2020, through September 11, 2020. Comments on the scope of the analysis were accepted at the public meetings, by mail and through the project website.

B.2.1 Public Scoping Notifications

The Navy prepared materials in 2019 to notify the public of the intent to prepare an EIS/OEIS and provide information about the Proposed Action and alternatives, and the opportunity to submit comments. Public notices prepared for the reopened scoping period included this information as well as the addition of Mobile, Alabama, as a potential location for commercial dismantlement. Public notices prepared in 2020 also explained that, due to federal and state guidance and measures put in place in

response to the coronavirus disease of 2019 (COVID-19), the Navy was unable to hold an in-person public scoping meeting in Mobile, Alabama.

The Navy made significant efforts to notify the public to ensure maximum public participation during both scoping processes. A summary of these efforts follows.

B.2.1.1 Notification Letters

During the 2019 scoping phase, tribal letters were mailed first-class on May 28, 2019, to 45 tribal leaders of federally recognized tribes. Stakeholder letters also were sent May 29–31, 2019, to 137 federal, state, and local elected officials, government agencies, and non-federally recognized tribes. A Spanish version of the stakeholder letter was included for local elected officials in Texas. Additionally, an email notification was sent to the staffers of local elected officials in the Washington state area.

During the 2020 scoping phase, tribal letters, along with a fact sheet booklet, were sent on August 10, 2020, to 19 tribal leaders of federally recognized tribes in the Mobile, Alabama area. Stakeholder letters, along with a fact sheet booklet, also were sent on August 10, 2020, to 135 federal, state, and local elected officials and government agencies, non-federally recognized tribes, and certain nongovernmental organizations in the Mobile, Alabama area.

Entities that received the scoping notification letters can be found in, and an example of the tribal letters, English and Spanish stakeholder letters, and email notification can be found in Figure B-1, Figure B-2, Figure B-3, Figure B-4, Figure B-5, Figure B-6, and Figure B-7.

Table B-1: Entities that Received the Scoping Notification Letters

Federally Recognized Native American Tribes and Non-Federally Recognized Tribes	
Federally Recognized Tribes Absentee Tribe of Shawnee Alabama-Coushatta Tribe of Texas Alabama-Quassarte Tribal Town Apache Tribe of Oklahoma Caddo Nation of Oklahoma Catawba Indian Nation Cherokee Nation Cheyenne and Arapaho Tribes, Oklahoma Chickahominy Indian Tribe Chickahominy Indian Tribe Eastern Division Chickasaw Nation Chitimacha Tribe of Louisiana Choctaw Nation Comanche Nation of Oklahoma Confederated Tribes and Bands of the Yakama Nation Confederated Tribes of the Umatilla Indian Reservation Confederated Tribes of the Warm Springs Reservation of Oregon Coushatta Tribe of Louisiana Delaware Nation Eastern Band of Cherokee Indians Eastern Shawnee Tribe of Oklahoma Hoh Indian Tribe Jamestown S'Klallam Tribe Jena Band of Choctaw Indians Kialegee Tribal Town Kickapoo Traditional Tribe of Texas Kiowa Indian Tribe of Oklahoma Lower Elwha Tribal Community Lummi Tribe of the Lummi Reservation Makah Indian Tribe of the Makah Indian Reservation Mescalero Apache Tribe of the Mescalero Reservation, New Mexico Miccosukee Tribe of Indians Tulalip Tribes of Washington	Mississippi Band of Choctaw Indians Monacan Nation Muckleshoot Indian Tribe Muscogee (Creek) Nation Nansemond Indian Nation Nez Perce Tribe Osage Nation of Oklahoma Pamunkey Indian Tribe Poarch Band of Creek Indians Port Gamble S'Klallam Tribe Puyallup Tribe of the Puyallup Reservation Quapaw Tribe of Oklahoma Quileute Tribe of the Quileute Reservation Quinault Indian Nation Rappahannock Tribe Samish Indian Nation Seminole Nation of Oklahoma Seminole Tribe of Florida Shawnee Tribe Skokomish Indian Tribe Suquamish Indian Tribe of the Port Madison Reservation Swinomish Indian Tribal Community Thlopthlocco Tribal Town Tonkawa Tribe of Indians of Oklahoma Tunica-Biloxi Indian Tribe Tuscarora Nation United Keetoowah Band of Cherokee Indians of Oklahoma Upper Mattaponi Tribe Upper Skagit Indian Tribe Wichita and Affiliated Tribes **Non-Federally Recognized Tribes** Wanapum Tribe of Indians Clatsop-Nehalem Confederated Tribes Lipan Apache Tribe of Texas MOWA Band of Choctaw
Federal Elected Officials and Federal Agencies	
U.S. Senators (Alabama, Texas, Virginia, Washington) U.S. Representatives (Alabama District 1, Texas District 34, Virginia District 3, Washington Districts 2, 4, 6) Bureau of Indian Affairs Northwest Regional Office Department of Transportation Office of Transportation Policy (P-32)	

Environmental Protection Agency
- Office of Federal Activities
- Office of Radiation and Indoor Air
- Region 3
  - Office of Communities, Tribes, and Environmental Assessment
  - Radiation Program
- Region 4
  - Gulf of Mexico Division
  - National Environmental Policy Act Program Office
  - Office of the Regional Administrator
- Region 6
  - Air And Radiation Division
  - Office of Communities, Tribes, and Environmental Assessment
- Region 10
  - Air and Radiation Division
  - Office of the Regional Administrator
  - Oregon Operations Office
  - Washington Operations Office

National Oceanic and Atmospheric Administration
- National Marine Fisheries Service
  - Columbia Basin Branch
  - Gulf of Mexico Branch
    - Habitat Conservation Division
  - Southeast Regional Office
  - West Coast Regional Office

Nuclear Regulatory Commission
- Division of Decommissioning, Uranium Recovery, and Waste Programs
- Region IV

Olympic Coast National Marine Sanctuary

U.S. Army Corps of Engineers
- Galveston District
- Mobile District
- Norfolk District
- Northwestern Division
- Seattle District
- Southwestern Division

U.S. Coast Guard
- Atlantic Area
- Office of Operating and Environmental Standards (CG-3 PSO)
- Sector Mobile

U.S. Department of Agriculture
- Natural Resources Conservation Science

U.S. Fish & Wildlife Service
- Conservation Planning Assistance Branch
- Gulf Restoration Office
- Northern Gulf Coastal Program
- Pacific Region
- Southeast Region
- Southwest Field Office
- Southwest Region
- Virginia Field Office
- Washington Field Office

State Elected Officials and State Agencies
Office of the Governor (Alabama, Texas, Virginia, Washington)
State Senators (Alabama District 33, Texas District 27, Virginia Districts 1, 2, 5, 6)
Commonwealth of Virginia Delegates (Districts 79, 83, 91, 92, 94, 95)
State Representatives (Alabama 97, Texas Districts 37, 38)
Washington State Legislature Representatives (Districts 8, 23, 26)
Alabama Department of Agriculture and Industries
Alabama Department of Conservation & Natural Resources
Marine Resources Division
Baldwin County
Mobile County
Montgomery County
State Lands Division
Coastal Section
Wildlife & Freshwater Fisheries
Alabama Department of Economic and Community Affairs
Energy Division
Alabama Department of Environmental Management
Nonpoint Source Pollution Control Program
Mobile Coastal Field Office
Alabama Department of Public Health
Baldwin County Health Department
Escambia County Health Department
Mobile County Health Department
Office of Radiation Control
Alabama Department of Transportation
Southwest Region
Alabama Emergency Management Agency
Alabama Forestry Commission
Coastal Program
Baldwin County
Mobile County
Southwest Regional
Alabama Geological Survey
Alabama Historical Commission
Alabama Soil & Water Conservation Committee
Alabama State Port Authority
Oregon Department of Agriculture
Natural Resources Program Area
Oregon Department of Energy
Nuclear Safety and Emergency Preparedness
Oregon Department of Environmental Quality
Oregon Department of Health
Radiation Protection Services
Oregon Department of State Lands
Oregon Military Department
Oregon Parks & Recreation Department
Oregon Water Resources Department
Pacific States Marine Fisheries Commission
South Carolina Department of Health and Environmental Control
Bureau of Environmental Health Services

Texas Commission on Environmental Quality
- Radioactive Materials Division

Texas Department of State Health Services
- Consumer Protection Division
- Radiation Control Program

Texas General Land Office
Texas Historical Commission
The Port of Virginia
Virginia Department of Environmental Quality
Virginia Department of Health
- Environmental Health and Safety
- Office and Radiation Protection

Virginia Department of Historic Resources
Virginia Marine Resources Commission
Washington Department of Archaeology & Historic Preservation
Washington Department of Ecology
- Nuclear Waste Program

Washington Department of Fish and Wildlife
- Region 3
- Region 6

Local Elected Officials and Local Agencies

Baldwin County, Alabama
- County Commissioner, District 3
- Highway Department
- Planning & Zoning Department
- Soil & Water Conservation District

Benton County, Washington
- County Administration
- County Commissioner, District 1
- Conservation District
- County Health District

Benton Soil and Water Conservation District (Oregon)
Cameron County, Texas
- County Administrator
- County Commissioner, Precincts 1, 3, 4
- County Judge

City of Bremerton (Washington)
- Mayor
- Fire Department

City of Brownsville (Texas)
- Fire Department
- City Manager
- Commissioners, At-Large “B,” Districts 1, 2, 3, 4
- Mayor

City of Daphne (Alabama)
- Building Inspection Department
- Environmental Programs Department

City of Foley (Alabama)
- Wolf Bay Watershed Watch

City of Hampton (Virginia)
- City Manager
- Mayor

Vice Mayor
City of Gulf Shores (Alabama)
Environmental
City of Kennewick (Washington)
Mayor
City of Mobile (Alabama)
Administrative Services
Build Mobile
City Council, Districts 1, 7
Engineering
Environmental
Fire and Rescue Department
Major Projects
Mayor
Parks and Recreation
Public Works
Real Estate Asset Management
City of Orange Beach (Alabama)
Building and Floodplain
Coastal Resources
Community Development
Environmental
City of Newport News (Virginia)
City Council
Central District Seat A, Seat B, North District Seat A, Seat B
Development
Emergency Management
Engineering
Fire Department
Planning Commission
Public Works
Recreation & Tourism
Waterworks
Zoning
Mayor
Vice Mayor
City of Norfolk (Virginia)
City Manager
Mayor
Public Relations Manager
City of Pasco (Washington)
Mayor
City of Port Orchard (Washington)
Mayor
City of Richland (Washington)
City Manager
Development Services
Fire & Emergency Services
Mayor
Mayor Pro Tem
Parks and Public Facilities
Planning Commission
Public Works

City of South Padre Island (Texas)
- City Planner

City of Spanish Fort (Alabama)
- Building and Zoning
- Planning Department

Escambia County, Florida
- Natural Resources
- RESTORE Program

Harlingen Texas Soil and Water Conservation
James City County Board of Supervisors (Virginia)
Kitsap Conservation District (Washington)
Kitsap County, Washington
- Administrative Services
- Commissioners, Districts 2, 3
- Department of Emergency Management
- Public Health District

Mobile Area Water & Sewer Service (Alabama)
Mobile County, Alabama
- Administrator
- County Attorney
- County Commissioners, Districts 1, 2, 3
- Environmental Services
- Soil & Water Conservation District

Mobile Historic Development Commission (Alabama)
Mobile Historic Preservation Society (Alabama)
Multnomah County, Oregon
- County Chairperson

Port of Benton (Washington)
Port of Bremerton (Washington)
Port of Brownsville (Texas)
South Alabama Regional Planning Commission
York County Board of Supervisors (Virginia)



DEPARTMENT OF THE NAVY
NAVAL BASE KITSAP
120 SOUTH DEWEY STREET
BREMERTON, WA 98314-5020

5090
Ser PRB4/00739
24 May 19

The Honorable Leonard Forsman
Suquamish Indian Tribe of the Port Madison Reservation
P.O. Box 498
Suquamish, WA 98392

Dear Chairperson Forsman:

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT FOR DISPOSAL OF DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65) AND ITS ASSOCIATED NAVAL REACTOR PLANTS

The Department of the Navy is preparing an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate the potential environmental impacts of disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier to include its naval reactor plants. This letter describes the upcoming public scoping meetings and process for submitting comments. While you are most welcome to attend the public meetings, the Navy also acknowledges our special relationship with the Suquamish Tribe and the Navy's responsibility to engage with individual Tribal governments to address questions or concerns regarding this proposed action if requested. Based upon our analysis to date, the preliminary assessment is that this proposed action may have the potential to significantly affect the Suquamish Tribe's tribal treaty rights, and pursuant to the Department of Defense American Indian and Alaska Native policy, I invite you to initiate Government-to-Government consultation.

USS Enterprise was commissioned in 1961 as the nation's first nuclear-powered aircraft carrier. After more than 50 years of service and one million miles safely steamed on nuclear power, the ship was decommissioned in 2017. Ex-Enterprise was constructed with eight naval reactor plants housed in rugged compartments inside the ship. As part of the decommissioning process, the nuclear fuel has been removed from the ship's eight reactor plants. Ex-Enterprise is currently being stored pier-side at Huntington Ingalls Industries Newport News Shipbuilding in Virginia.

In 2012, the Navy prepared an Environmental Assessment (EA) for the disposal of decommissioned, defueled naval reactor plants from ex-Enterprise. In the Finding of No Significant Impact, the Navy decided to remove the reactor compartments from ex-Enterprise at Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) in Bremerton, Washington, prepare reactor compartments for disposal as reactor compartment packages, recycle remnant hull sections, and transport the reactor compartment packages for disposal at the U.S. Department of Energy's (DOE) Hanford Site near Richland, Washington. The process

Figure B-1: Tribal Scoping 2019 Notification Letter

described in the 2012 EA is an extension of the established program that has been utilized to safely dispose of 133 naval reactor compartments since 1986.

The Navy has since identified new disposal alternatives that may be more cost-effective and better utilize available resources within the Navy's public shipyards. Therefore, the Navy is preparing this EIS/OEIS to consider these alternatives and potentially others that may be identified during the EIS/OEIS scoping process. The Navy is considering the following preliminary alternatives:

- Partially dismantle ex-Enterprise at a commercial disposal facility by removing areas of the ship outside of the naval reactor compartments. The remainder of the ship containing the naval reactor compartments would then be transported to PSNS & IMF for processing and disposal. PSNS & IMF would create eight individual reactor compartment packages for disposal at the DOE Hanford Site, using the established program that has successfully disposed of naval reactor compartments for over 30 years.

- Partially dismantle ex-Enterprise at a commercial disposal facility by removing areas of the ship outside of the naval reactor compartments. The remainder of the ship containing the naval reactor compartments would then be transported to PSNS & IMF for processing and disposal. PSNS & IMF would create four individual reactor compartment packages for disposal at the DOE Hanford Site, using the established program that has successfully disposed of naval reactor compartments for over 30 years. Each package would contain two of the ship's reactor plants, and thus be larger and heavier than the packages that would be needed to dispose of the eight reactor plants individually.

- Dismantle ex-Enterprise at an authorized commercial ship dismantlement facility including cutting apart the eight reactor plants into segments for packaging into several hundred small containers for subsequent disposal at established DOE or commercial waste facilities.

The Navy will also evaluate the No Action alternative, which involves waterborne storage of ex-Enterprise.

In compliance with the National Environmental Policy Act (NEPA) of 1969, a public scoping period will be held from May 31, 2019 to July 15, 2019. The Navy will conduct open house public scoping meetings to support an early and open process for determining the scope of issues to be addressed and for identifying significant issues related to the proposed action. Four public scoping meetings will be held:

- June 18, 2019 from 5:00 p.m. to 8:00 p.m. at Denbigh Community Center, 15198 Warwick Boulevard, Newport News, VA 23608;
- June 20, 2019 from 5:00 p.m. to 8:00 p.m. at Fort Brown Memorial Center, 600 International Boulevard, Brownsville, TX 78520;
- June 25, 2019 from 5:00 p.m. to 8:00 p.m. at Mountain View Middle School, 2400 Perry Avenue, Bremerton, WA 98310;
- June 27, 2019 from 5:00 p.m. to 8:00 p.m. at Richland Public Library, 955 Northgate Drive, Richland, WA 99352.

2

Figure B-1: Tribal Scoping 2019 Notification Letter (continued)

Should you choose not to initiate Government-to-Government consultations, or in addition to that process, you may provide input on identifying specific issues and concerns that should be through participation in the above-listed public scoping meetings, or by submitting comments online at the Navy's EIS/OEIS project website www.carrierdisposaleis.com. These comments must be received by July 15, 2019. You may submit comments, additional information, and updated contact information to:

Public Affairs Office
Attn: Kellie Randall
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave.
Bremerton, WA 98314-5001

The DOE is a cooperating agency for this EIS/OEIS. The Navy's Notice of Intent to prepare this EIS/OEIS will be available at the above Navy website as well as the DOE Hanford NEPA website at www.hanford.gov/page.cfm/EnvironmentalImpactStatements. Additional supporting NEPA documents will also be available on the Navy's website, including the 2012 EA for the ex-Enterprise and the 1996 EIS.

I look forward to working with you to provide additional information you may need and address your concerns. Feel free to contact me at [redacted] or [redacted], or my Environmental Director, Mr. Greg Leicht, [redacted] or [redacted] with any questions or comments.

Sincerely,

E. A. Schrader
Captain, U.S. Navy
Commanding Officer

3

Figure B-1: Tribal Scoping 2019 Notification Letter (continued)

DEPARTMENT OF THE NAVY
NAVAL NUCLEAR PROPULSION PROGRAM
NAVAL SEA SYSTEMS COMMAND (SEA 08)
1333 ISSAC HULL AVENUE SE
WASHINGTON NAVY YARD DC 20376-8010

24 May 2019

The Honorable Jerome Delvin
Benton County
P.O. Box 190
Prosser, WA 99350

Dear Chairperson Delvin:

The Department of the Navy is preparing an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate the potential environmental impacts of disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier to include its naval reactor plants. This letter describes the upcoming public scoping meetings and process for submitting comments. The Navy is requesting your comments on the scope, content, and issues to be considered during the development of the EIS/OEIS.

USS Enterprise was commissioned in 1961 as the nation's first nuclear-powered aircraft carrier. After more than 50 years of service and one million miles safely steamed on nuclear power, the ship was decommissioned in 2017. Ex-Enterprise was constructed with eight naval reactor plants housed in rugged compartments inside the ship. As part of the decommissioning process, the nuclear fuel has been removed from the ship's eight reactor plants. Ex-Enterprise is currently being stored pier-side at Huntington Ingalls Industries Newport News Shipbuilding.

In 2012, the Navy prepared an Environmental Assessment (EA) for the disposal of decommissioned, defueled naval reactor plants from ex-Enterprise. In the Finding of No Significant Impact, the Navy decided to remove the reactor compartments from ex-Enterprise at Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) in Bremerton, Washington, prepare the reactor compartments for disposal as reactor compartment packages, recycle remnant hull sections, and transport the reactor compartment packages for disposal at the U.S. Department of Energy (DOE) Hanford Site near Richland, Washington. The process described in the 2012 EA is an extension of the established program that has been utilized to safely dispose of 133 naval reactor compartments since 1986.

The Navy has since identified new disposal alternatives that may be more cost-effective and better utilize available resources within the Navy's public shipyards. Therefore, the Navy is preparing this EIS/OEIS to consider these alternatives and potentially others that may be identified during the EIS/OEIS scoping process. The Navy is considering the following preliminary alternatives:

- Partially dismantle ex-Enterprise at a commercial disposal facility by removing areas of the ship outside of the naval reactor compartments. The remainder of the ship containing the naval reactor compartments would then be transported to PSNS & IMF for processing

Figure B-2: Stakeholder Scoping 2019 Notification Letter (English)

and disposal. PSNS & IMF would create eight individual reactor compartment packages for disposal at the DOE Hanford Site, using the established program that has successfully disposed of naval reactor compartments for over 30 years.

- Partially dismantle ex-Enterprise at a commercial disposal facility by removing areas of the ship outside of the naval reactor compartments. The remainder of the ship containing the naval reactor compartments would then be transported to PSNS & IMF for processing and disposal. PSNS & IMF would create four individual reactor compartment packages for disposal at the DOE Hanford Site, using the established program that has successfully disposed of naval reactor compartments for over 30 years. Each package would contain two of the ship's reactor plants, and thus be larger and heavier than the packages that would be needed to dispose of eight reactor plants individually.

- Dismantle ex-Enterprise at an authorized commercial ship dismantlement facility, including cutting apart the eight reactor plants into segments for packaging into several hundred small containers for subsequent disposal at established DOE or commercial waste facilities.

The Navy will also evaluate the No Action alternative, which involves waterborne storage of ex-Enterprise.

In compliance with the National Environmental Policy Act (NEPA) of 1969, a public scoping period will be held from May 31, 2019 to July 15, 2019. The Navy will conduct open house public scoping meetings to support an early and open process for determining the scope of issues to be addressed and for identifying significant issues related to the proposed action. Four public scoping meetings will be held:

- June 18, 2019 from 5:00 p.m. to 8:00 p.m. at the Denbigh Community Center, 15198 Warwick Boulevard, Newport News, VA 23608;

- June 20, 2019 from 5:00 p.m. to 8:00 p.m. at Fort Brown Memorial Center, 600 International Boulevard, Brownsville, TX 78520;

- June 25, 2019 from 5:00 p.m. to 8:00 p.m. at Mountain View Middle School, 2400 Perry Avenue, Bremerton, WA 98310;

- June 27, 2019 from 5:00 p.m. to 8:00 p.m. at Richland Public Library, 955 Northgate Drive, Richland, WA 99352.

Your input in identifying the specific issues and concerns that should be assessed is important to the process. Regardless of whether you are able to participate in the public scoping meetings, you may submit comments, additional information, and any updated contact information to:

2

Figure B-2: Stakeholder Scoping 2019 Notification Letter (English) (continued)

Congressional and Public Affairs Office
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Attn: Kellie Randall, CVN 65 EIS
1400 Farragut Avenue, Stop 2072
Bremerton, WA 98314-2072

You may also submit comments online at the Navy's EIS/OEIS project website www.CarrierDisposalEIS.com. To be considered for the Draft EIS/OEIS, the Navy must receive comments by July 15, 2019.

The DOE is a cooperating agency for this EIS/OEIS. The Navy's Notice of Intent to prepare this EIS/OEIS will be available at the above Navy website as well as the DOE Hanford NEPA website at www.hanford.gov/page.cfm/EnvironmentalImpactStatements. Additional supporting NEPA documents will also be available on the Navy's website, including the 2012 EA for the ex-Enterprise and the 1996 EIS.

I look forward to working with you to provide additional information you may need and address your concerns. Feel free to contact Kellie Randall, Public Affairs Officer, PSNS & IMF, at (360) 476-7111 with any questions or comments.

Sincerely,

J. M. AVERY
Director, Regulatory Affairs Division
Naval Nuclear Propulsion Program/
Naval Reactors

3

Figure B-2: Stakeholder Scoping 2019 Notification Letter (English) (continued)

DEPARTMENT OF THE NAVY
NAVAL NUCLEAR PROPULSION PROGRAM
NAVAL SEA SYSTEMS COMMAND (SEA 08)
1333 ISSAC HULL AVENUE SE
WASHINGTON NAVY YARD DC 20376-8010

24 de mayo de 2019

El Departamento de la Armada de los Estados Unidos está preparando una Declaración de Impacto Ambiental/Declaración de Impacto Ambiental en el Extranjero (EIS/OEIS, por sus siglas en inglés) para evaluar los posibles impactos ambientales resultantes de la eliminación del ex-Enterprise decomisionado y sin combustible nuclear (CVN 65) para incluir sus plantas navales de reactores asociadas. Esta carta describe las próximas reuniones públicas de determinación del alcance del EIS/OEIS y el proceso de presentación de comentarios. La Armada está solicitando sus comentarios sobre el alcance, el contenido y los asuntos que se considerarán durante el desarrollo del EIS/OEIS.

USS Enterprise fue comisionado en 1961 como el primer portaaviones de propulsión nuclear del país. Después de más de 50 años de servicio y un millón de millas impulsadas de manera segura con energía nuclear, el barco fue decomisionado en 2017. El ex -Enterprise se construyó con ocho plantas de reactores navales ubicadas en compartimentos resistentes dentro del barco. Como parte del proceso de decomisionamiento, el combustible nuclear ha sido retirado de las ocho plantas de reactores del barco. Actualmente, el ex -Enterprise está almacenado en el muelle de Huntington Ingalls Industries Newport News Shipbuilding.

En 2012, la Armada preparó una Evaluación Ambiental (EA, por sus siglas en inglés) para la eliminación de las plantas navales de reactores desarmadas y sin combustible nuclear del ex- Enterprise. Después de obtener un Resultado de Ningún Impacto Significativo (FONSI, por sus siglas en inglés), la Armada decidió remover los compartimentos del reactor del ex-Enterprise en el Astillero Naval de Puget Sound y la Instalación de Mantenimiento Intermedio (PSNS e IMF, por sus siglas en inglés) en Bremerton, Washington, preparar los compartimentos del reactor para su eliminación en paquetes de eliminación para los compartimentos de reactor, reciclar las secciones del casco remanente, y transportar los paquetes de eliminación para los compartimentos de reactor al Sitio Hanford del Departamento de Energía de los Estados Unidos (DOE, por sus siglas en inglés) cerca de Richland, Washington. El proceso descrito en la EA de 2012 es una extensión del programa establecido que se ha utilizado para eliminar de forma segura los 133 compartimentos de los reactores navales desde 1986.

Desde entonces, la Armada ha identificado nuevas alternativas de eliminación que pueden ser más rentables y utilizar mejor los recursos disponibles en los astilleros navales públicos de la Armada. Por lo tanto, la Armada está preparando esta EIS/OEIS para considerar estas alternativas y otras posibles que puedan identificarse durante el proceso de alcance de la EIS/OEIS. La Armada está considerando las siguientes alternativas preliminares:

- Desmantelar parcialmente el ex-Enterprise en una instalación comercial de eliminación retirando partes del barco fuera de los compartimientos del reactor naval. El resto del barco que contiene los compartimientos del reactor naval se transportarían luego al PSNS e IMF para su procesamiento y eliminación. PSNS e IMF crearían ocho paquetes individuales de compartimientos de reactores para su eliminación en el Sitio de Hanford

Figure B-3: Stakeholder Scoping 2019 Notification Letter (Spanish)

del DOE, utilizando el programa establecido que ha eliminado exitosamente los compartimientos de reactores navales durante más de 30 años.

- Desmantelar parcialmente el ex-Enterprise en una instalación comercial de eliminación retirando partes del barco fuera de los compartimientos del reactor naval. El resto del barco que contiene los compartimientos del reactor naval se transportaría luego al PSNS e IMF para su procesamiento y eliminación. PSNS e IMF crearían cuatro paquetes individuales de compartimientos de reactores para su eliminación en el Sitio de Hanford del DOE, utilizando el programa establecido que ha eliminado exitosamente los compartimientos de reactores navales durante más de 30 años. Cada paquete contendría dos de las plantas de reactores del barco, y por lo tanto sería más grande y más pesados que los paquetes que se necesitarían para la eliminación individual de ocho plantas de reactores.

- Desmantelar el ex -Enterprise en una instalación comercial de desmantelamiento de barcos, incluyendo la separación de las ocho plantas de reactores en segmentos para ser empaquetados en varios cientos de pequeños contenedores para su posterior eliminación en instalaciones establecidas del DOE o instalaciones comerciales de desechos.

La Armada también evaluará la alternativa de "no acción", que implica el almacenamiento en el agua del ex -Enterprise.

De conformidad con la Acta de política nacional del medioambiente (NEPA, por sus siglas en inglés) de 1969, se llevará a cabo un periodo de alcance público desde el 31 de mayo de 2019 hasta el 15 de julio de 2019. La Armada llevará a cabo reuniones públicas tipo casa abierta para la determinación de alcance del EIS/OEIS para apoyar un proceso inicial abierto para determinar el alcance de los asuntos que se abordarán, así como para identificar asuntos importantes relacionados con la acción propuesta. Se llevarán a cabo cuatro reuniones públicas para el alcance del EIS/OEIS:

- 18 de junio de 2019 de 5:00 p.m. a 8:00 p.m. en Denbigh Community Center, 15198 Warwick Boulevard, Newport News, VA 23608;

- 20 de junio de 2019 de 5:00 p.m. a 8:00 p.m. en Fort Brown Memorial Center, 600 International Boulevard, Brownsville, TX 78520;

- 25 de junio de 2019 de 5:00 p.m. a 8:00 p.m. en Mountain View Middle School, 2400 Perry Avenue, Bremerton, WA 98310;

- 27 de junio de 2019 de 5:00 p.m. a 8:00 p.m. en Richland Public Library, 955 Northgate Drive, Richland, WA 99352.

Sus comentarios identificando específicamente los asuntos e inquietudes que se deben evaluar son importantes para el proceso. Independientemente de si puede participar en las reuniones públicas, puede enviar sus comentarios, información adicional y cualquier información de contacto actualizada a:

Figure B-3: Stakeholder Scoping 2019 Notification Letter (Spanish) (continued)

Congressional and Public Affairs Office
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Attn: Kellie Randall, CVN 65 EIS
1400 Farragut Avenue, Stop 2072
Bremerton, WA 98314-2072

También puede enviar sus comentarios en línea en el sitio web del proyecto de la EIS/OEIS de la Armada en www.CarrierDisposalEIS.com. Para que sus comentarios sean considerados para la elaboración del Borrador de la EIS/OEIS, la Armada debe recibir sus comentarios a más tardar el 15 de julio de 2019.

El DOE es una agencia cooperante en la elaboración de esta EIS/OEIS. El Aviso de Intención de la Armada para la preparación de esta EIS/OEIS estará disponible en el sitio web de la Armada indicado anteriormente, así como en el sitio web de la NEPA del DOE de Hanford en www.hanford.gov/page.cfm/EnvironmentalImpactStatements. Los documentos adicionales relativos a la NEPA también estarán disponibles en el sitio web de la Armada, incluyendo la EA de 2012 del ex-Enterprise y la EIS de 1996.

Espero trabajar con usted para proporcionarle la información adicional que pueda necesitar y responder a sus inquietudes. No dude en comunicarse con Kellie Randall, la Oficial de Asuntos Públicos de PSNS e IMF, llamando al (360) 476-7111 si tiene alguna pregunta o comentario.

Atentamente,

J. M. AVERY
El Director, División de Asuntos Regulatorios
Programa Naval de Propulsión Nuclear/
Reactores Navales

3

Figure B-3: Stakeholder Scoping 2019 Notification Letter (Spanish) (continued)

Subject: NSO/ex-Enterprise EIS/OEIS
Attachments: 008-19 Navy to prepare an Environmental Impact Statement - Overseas Environmental Impact Statement.pdf
NWNavyChallengePackage-190531.pdf

Good morning. First, thanks to those of you that were able to come to the Naval Special Operations (NSO) demonstration last week. Hopefully, that was helpful and gave you some idea of the training the Navy Seals have been doing in Washington State and around Puget Sound. I wanted to let you know there will be one more demo on June 12th, at 1:30 p.m. for those of you that missed last week's demo due to scheduling conflicts, but have an interest and would like to attend next week on the 12th. Please let me know as soon as possible.

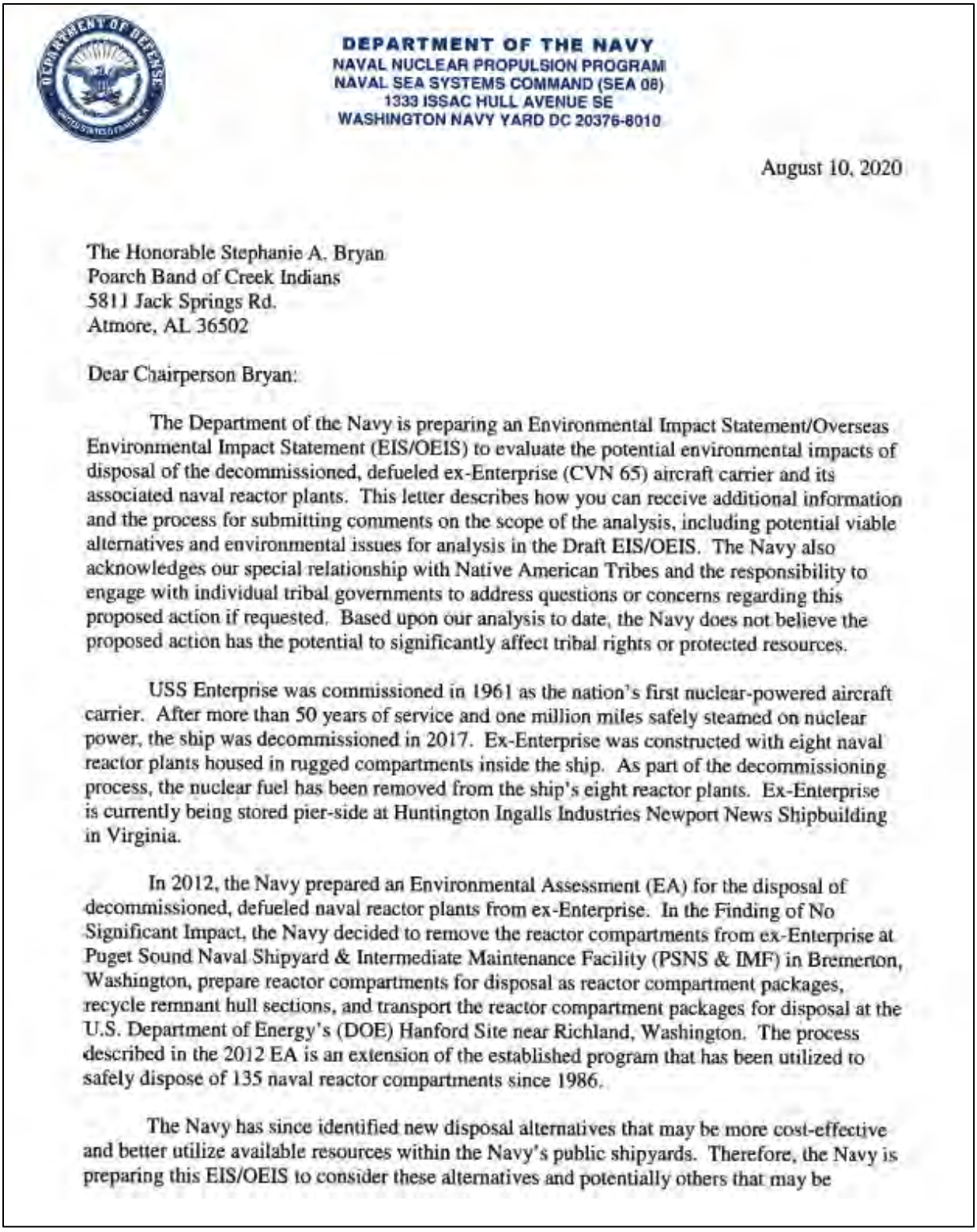
On a different note, the Navy is preparing to evaluate the potential environmental impacts associated with the disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier, including its naval reactor plants by preparing an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). I wanted to forward a copy of the press release sent to the media for your information and awareness. I am also forwarding the most current version of the Challenge Package. The Challenge Package has background and talking points on some of the Navy projects. This document provides information for your awareness and to help you to answer any questions you may get from your constituents - or you can always give me a call if you like.

If you ever have any questions or concerns, please give me a call.

Very Respectfully, Sheila

Sheila Murray
Navy Region Northwest Deputy Public Affairs
[redacted]

Figure B-4: Email Notification 2019



DEPARTMENT OF THE NAVY
NAVAL NUCLEAR PROPULSION PROGRAM
NAVAL SEA SYSTEMS COMMAND (SEA 08)
1333 ISSAC HULL AVENUE SE
WASHINGTON NAVY YARD DC 20376-8010

August 10, 2020

The Honorable Stephanie A. Bryan
Poarch Band of Creek Indians
5811 Jack Springs Rd.
Atmore, AL 36502

Dear Chairperson Bryan:

The Department of the Navy is preparing an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate the potential environmental impacts of disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier and its associated naval reactor plants. This letter describes how you can receive additional information and the process for submitting comments on the scope of the analysis, including potential viable alternatives and environmental issues for analysis in the Draft EIS/OEIS. The Navy also acknowledges our special relationship with Native American Tribes and the responsibility to engage with individual tribal governments to address questions or concerns regarding this proposed action if requested. Based upon our analysis to date, the Navy does not believe the proposed action has the potential to significantly affect tribal rights or protected resources.

USS Enterprise was commissioned in 1961 as the nation's first nuclear-powered aircraft carrier. After more than 50 years of service and one million miles safely steamed on nuclear power, the ship was decommissioned in 2017. Ex-Enterprise was constructed with eight naval reactor plants housed in rugged compartments inside the ship. As part of the decommissioning process, the nuclear fuel has been removed from the ship's eight reactor plants. Ex-Enterprise is currently being stored pier-side at Huntington Ingalls Industries Newport News Shipbuilding in Virginia.

In 2012, the Navy prepared an Environmental Assessment (EA) for the disposal of decommissioned, defueled naval reactor plants from ex-Enterprise. In the Finding of No Significant Impact, the Navy decided to remove the reactor compartments from ex-Enterprise at Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) in Bremerton, Washington, prepare reactor compartments for disposal as reactor compartment packages, recycle remnant hull sections, and transport the reactor compartment packages for disposal at the U.S. Department of Energy's (DOE) Hanford Site near Richland, Washington. The process described in the 2012 EA is an extension of the established program that has been utilized to safely dispose of 135 naval reactor compartments since 1986.

The Navy has since identified new disposal alternatives that may be more cost-effective and better utilize available resources within the Navy's public shipyards. Therefore, the Navy is preparing this EIS/OEIS to consider these alternatives and potentially others that may be

Figure B-5: Tribal Scoping 2020 Notification Letter

identified during the EIS/OEIS scoping process. The Navy is considering the following preliminary alternatives:

- Partially dismantle ex-Enterprise at a commercial disposal facility by removing areas of the ship outside of the naval reactor compartments. The remainder of the ship containing the naval reactor compartments would then be transported to PSNS & IMF for processing and disposal. PSNS & IMF would create eight individual reactor compartment packages for disposal at the DOE Hanford Site, using the established program that has successfully disposed of naval reactor compartments for over 30 years.

- Partially dismantle ex-Enterprise at a commercial disposal facility by removing areas of the ship outside of the naval reactor compartments. The remainder of the ship containing the naval reactor compartments would then be transported to PSNS & IMF for processing and disposal. PSNS & IMF would create four individual reactor compartment packages for disposal at the DOE Hanford Site, using the established program that has successfully disposed of naval reactor compartments for over 30 years. Each package would contain two of the ship's reactor plants, and thus be larger and heavier than the packages that would be needed to dispose of the eight reactor plants individually.

- Dismantle ex-Enterprise at an authorized commercial ship dismantlement facility including cutting apart the eight reactor plants into segments for packaging into several hundred small containers for subsequent disposal at established DOE or commercial waste facilities.

The Navy will also evaluate a No Action alternative, which involves waterborne storage of ex-Enterprise.

As a result of comments received during public scoping conducted in 2019, the Navy has added the Mobile, Alabama area to the area of study for this EIS/OEIS. In compliance with the National Environmental Policy Act (NEPA) of 1969, an additional public scoping period will be held from August 12, 2020 to September 11, 2020 to support an early and open process for determining the scope of issues to be addressed and identifying significant issues related to the proposed action. You may learn more about the project in the enclosed fact sheet and at the project's website, www.CarrierDisposalEIS.com. Due to current federal and state guidance and measures put in place in response to COVID-19, the Navy is unable to hold an in-person public scoping meeting in Mobile, Alabama. To assist the public in determining whether to submit a formal comment on the project, the Navy will respond to questions from the public from August 19, 2020 to September 2, 2020. During this period, the public may submit questions to the Navy about the proposed action at info@carrierdisposaleis.com. Public meetings are expected to be held after the release of the Draft EIS/OEIS next year.

Your input in identifying the specific issues and concerns that should be assessed is important to the process. You may provide input by submitting comments by mail or online at the Navy's EIS/OEIS project website www.CarrierDisposalEIS.com. These comments must be received by September 11, 2020 for consideration in the Draft EIS/OEIS. You may submit comments, additional information, and updated contact information to:

2

Figure B-5: Tribal Scoping 2020 Notification Letter (continued)

Congressional and Public Affairs Office
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Attn: Kellie Randall, CVN 65 EIS
1400 Farragut Avenue, Stop 2072
Bremerton, WA 98314-2072

If you desire to initiate Government-to-Government consultation, please forward the name(s), title(s), and contact information for your point(s) of contact so my staff can coordinate our consultation with you.

The DOE is a cooperating agency for this EIS/OEIS. The Navy's Notice of Intent to prepare this EIS/OEIS is available at the above Navy website as well as the DOE Hanford NEPA website at www.hanford.gov/page.cfm/EnvironmentalImpactStatements. Additional supporting NEPA documents are also available on the Navy's website, including the 2012 EA for the ex-Enterprise and the 1996 EIS.

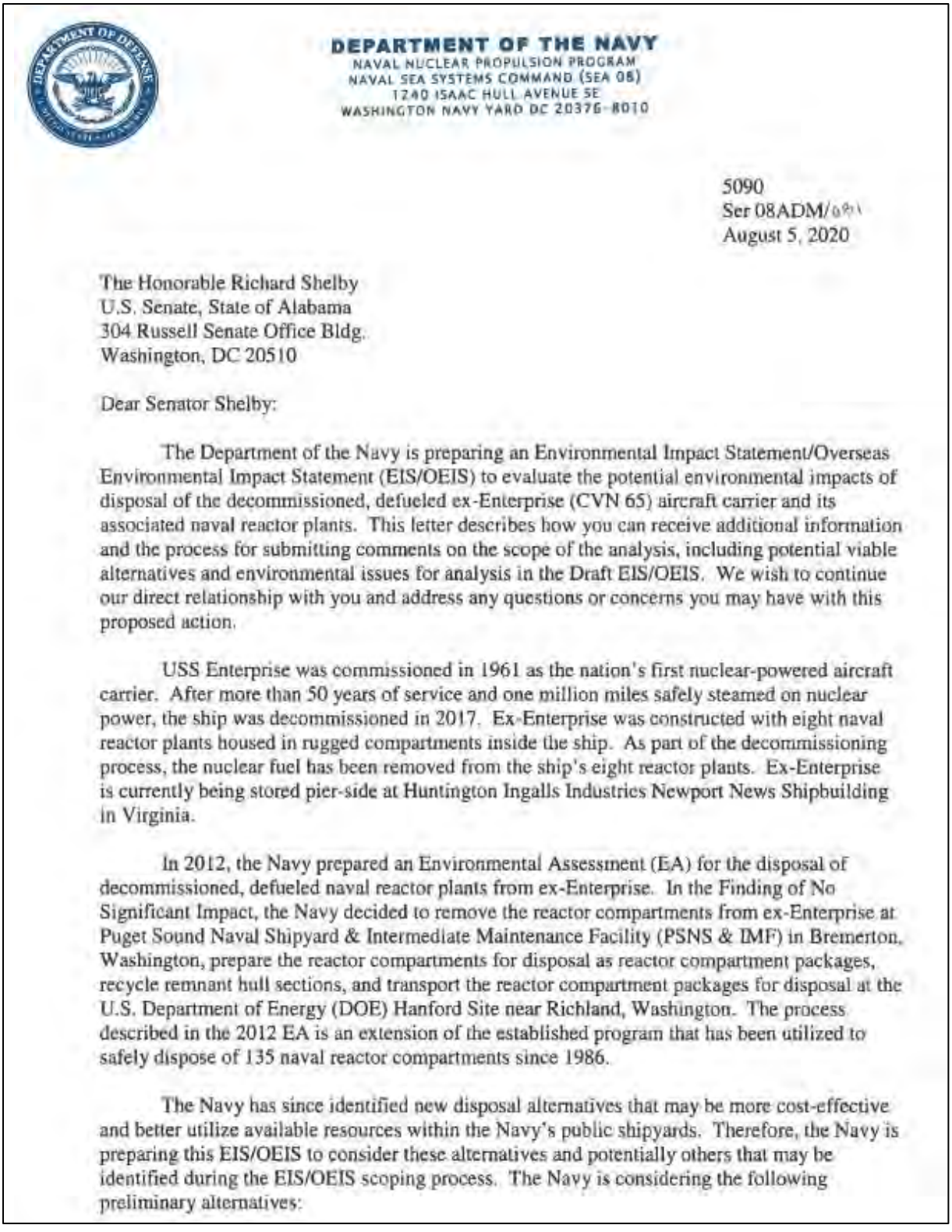
I look forward to working with you to provide additional information you may need and address your concerns. Please contact the Navy Region Southeast On-Scene Coordinator Representative, John Baxter, at [redacted] with any questions or comments.

Sincerely,

J. M. AVERY
Director, Regulatory Affairs Division
Naval Nuclear Propulsion Program/
Naval Reactors

3

Figure B-5: Tribal Scoping 2020 Notification Letter (continued)



DEPARTMENT OF THE NAVY
NAVAL NUCLEAR PROPULSION PROGRAM
NAVAL SEA SYSTEMS COMMAND (SEA 08)
1240 ISAAC HULL AVENUE SE
WASHINGTON NAVY YARD DC 20376-8010

5090
Ser 08ADM/0[illegible]
August 5, 2020

The Honorable Richard Shelby
U.S. Senate, State of Alabama
304 Russell Senate Office Bldg.
Washington, DC 20510

Dear Senator Shelby:

The Department of the Navy is preparing an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate the potential environmental impacts of disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier and its associated naval reactor plants. This letter describes how you can receive additional information and the process for submitting comments on the scope of the analysis, including potential viable alternatives and environmental issues for analysis in the Draft EIS/OEIS. We wish to continue our direct relationship with you and address any questions or concerns you may have with this proposed action.

USS Enterprise was commissioned in 1961 as the nation's first nuclear-powered aircraft carrier. After more than 50 years of service and one million miles safely steamed on nuclear power, the ship was decommissioned in 2017. Ex-Enterprise was constructed with eight naval reactor plants housed in rugged compartments inside the ship. As part of the decommissioning process, the nuclear fuel has been removed from the ship's eight reactor plants. Ex-Enterprise is currently being stored pier-side at Huntington Ingalls Industries Newport News Shipbuilding in Virginia.

In 2012, the Navy prepared an Environmental Assessment (EA) for the disposal of decommissioned, defueled naval reactor plants from ex-Enterprise. In the Finding of No Significant Impact, the Navy decided to remove the reactor compartments from ex-Enterprise at Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) in Bremerton, Washington, prepare the reactor compartments for disposal as reactor compartment packages, recycle remnant hull sections, and transport the reactor compartment packages for disposal at the U.S. Department of Energy (DOE) Hanford Site near Richland, Washington. The process described in the 2012 EA is an extension of the established program that has been utilized to safely dispose of 135 naval reactor compartments since 1986.

The Navy has since identified new disposal alternatives that may be more cost-effective and better utilize available resources within the Navy's public shipyards. Therefore, the Navy is preparing this EIS/OEIS to consider these alternatives and potentially others that may be identified during the EIS/OEIS scoping process. The Navy is considering the following preliminary alternatives:

Figure B-6: Stakeholder Scoping 2020 Notification Letter (English)

- Partially dismantle ex-Enterprise at a commercial disposal facility by removing areas of the ship outside of the naval reactor compartments. The remainder of the ship containing the naval reactor compartments would then be transported to PSNS & IMF for processing and disposal. PSNS & IMF would create eight individual reactor compartment packages for disposal at the DOE Hanford Site, using the established program that has successfully disposed of naval reactor compartments for over 30 years.

- Partially dismantle ex-Enterprise at a commercial disposal facility by removing areas of the ship outside of the naval reactor compartments. The remainder of the ship containing the naval reactor compartments would then be transported to PSNS & IMF for processing and disposal. PSNS & IMF would create four individual reactor compartment packages for disposal at the DOE Hanford Site, using the established program that has successfully disposed of naval reactor compartments for over 30 years. Each package would contain two of the ship's reactor plants, and thus be larger and heavier than the packages that would be needed to dispose of the eight reactor plants individually.

- Dismantle ex-Enterprise at an authorized commercial ship dismantlement facility, including cutting apart the eight reactor plants into segments for packaging into several hundred small containers for subsequent disposal at established DOE or commercial waste facilities.

The Navy will also evaluate a No Action alternative, which involves waterborne storage of ex-Enterprise.

As a result of comments received during public scoping conducted in 2019, the Navy has added the Mobile, Alabama area to the area of study for this EIS/OEIS. In compliance with the National Environmental Policy Act (NEPA) of 1969, an additional public scoping period will be held from August 12, 2020 to September 11, 2020 to support an early and open process for determining the scope of issues to be addressed and identifying significant issues related to the proposed action. You may learn more about the project in the enclosed fact sheet and at the project's website, www.CarrierDisposalEIS.com. Due to current federal and state guidance and measures put in place in response to COVID-19, the Navy is unable to hold an in-person public scoping meeting in Mobile, Alabama. To assist the public in determining whether to submit a formal comment on the project, the Navy will respond to questions from the public from August 19, 2020 to September 2, 2020. During this period, the public may submit questions to the Navy about the proposed action at info@carrierdisposaleis.com. Public meetings are expected to be held after the release of the Draft EIS/OEIS next year.

Your input in identifying the specific issues and concerns that should be assessed is important to the process. You may submit comments, additional information, and any updated contact information to:

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Figure B-6: Stakeholder Scoping 2020 Notification Letter (English) (continued)

Congressional and Public Affairs Office
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Attn: Kellie Randall, CVN 65 EIS
1400 Farragut Avenue, Stop 2072
Bremerton, WA 98314-2072

You may also submit comments online at the Navy's EIS/OEIS project website www.CarrierDisposalEIS.com. To be considered for the Draft EIS/OEIS, the Navy must receive comments by September 11, 2020.

The DOE is a cooperating agency for this EIS/OEIS. The Navy's Notice of Intent to prepare this EIS/OEIS is available at the above Navy website as well as the DOE Hanford NEPA website at www.hanford.gov/page.cfm/EnvironmentalImpactStatements. Additional supporting NEPA documents are also available on the Navy's website, including the 2012 EA for the ex-Enterprise and the 1996 EIS.

I look forward to working with you to provide additional information you may need and address your concerns. Feel free to contact me or Mr. Neil Lapointe at [redacted] with any questions or comments.

Very Respectfully,

J. F. CALDWELL, JR.
Admiral, U.S. Navy

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Figure B-6: Stakeholder Scoping 2020 Notification Letter (English) (continued)

DEPARTAMENTO DE LA ARMADA
PROGRAMA DE PROPULSIÓN NUCLEAR DE LA ARMADA
NAVAL SEA SYSTEMS COMMAND (SEA 08)
1333 ISSAC HULL AVENUE SE
WASHINGTON NAVY YARD DC 20376-8010

10 de agosto de 2020

Estimado/a:

El Departamento de la Armada está preparando una Declaración de Impacto Ambiental/Declaración de Impacto Ambiental en el Extranjero (EIS/OEIS, por sus siglas en inglés) para evaluar los posibles impactos ambientales asociados con la eliminación del portaaviones ex-Enterprise decomisionado y sin combustible nuclear (CVN 65) y sus plantas de reactores navales asociadas. Esta carta describe de qué manera usted puede recibir información adicional y le comunica el proceso para enviar comentarios sobre el alcance del análisis, incluidas las posibles alternativas viables y los temas ambientales para análisis en el Borrador de la EIS/OEIS.

USS Enterprise fue comisionado en 1961 como el primer portaaviones de propulsión nuclear del país. Después de más de 50 años de servicio y un millón de millas impulsadas de manera segura con energía nuclear, el barco fue decomisionado en 2017. El ex-Enterprise se construyó con ocho plantas de reactores navales ubicadas en compartimentos resistentes dentro del barco. Como parte del proceso de decomisionamiento, el combustible nuclear ha sido retirado de las ocho plantas de reactor del barco. Actualmente, el ex-Enterprise está almacenado en el muelle de Huntington Ingalls Industries Newport News Shipbuilding en Virginia.

En 2012, la Armada preparó una Evaluación Ambiental (EA, por sus siglas en inglés) para la eliminación de las plantas de reactores navales desarmadas y sin combustible nuclear del ex-Enterprise. Después de obtener un Resultado de Ningún Impacto Significativo (FONSI, por sus siglas en inglés), la Armada decidió remover los compartimientos del reactor del ex-Enterprise en el Astillero Naval de Puget Sound y la Instalación de Mantenimiento Intermedio (PSNS e IMF, por sus siglas en inglés) en Bremerton, Washington, preparar los compartimentos del reactor para su eliminación en paquetes de eliminación para los compartimentos de reactor, reciclar las secciones del casco remanente, y transportar los paquetes de eliminación de los compartimientos de reactor al Sitio de Hanford del Departamento de Energía de los Estados Unidos cerca de Richland, Washington. El proceso descrito en la Evaluación Ambiental de 2012 es una extensión del programa establecido que se ha utilizado para eliminar de forma segura los 133 compartimentos de los reactores navales desde 1986.

Desde entonces, la Armada ha identificado nuevas alternativas de eliminación que pueden ser más rentables y que utilizan mejor los recursos disponibles en los astilleros navales públicos de la Armada. Por lo tanto, la Armada está preparando esta EIS/OEIS para considerar estas alternativas y otras posibles que puedan identificarse durante el proceso de alcance de la EIS/OEIS. La Armada está considerando las siguientes alternativas preliminares:

- Desmantelar parcialmente el ex-Enterprise en una instalación comercial de eliminación retirando partes del barco fuera de los compartimentos del reactor naval. El resto del

Figure B-7: Stakeholder Scoping 2020 Notification Letter (Spanish)

barco que contiene los compartimientos del reactor naval se transportarían luego al PSNS e IMF para su procesamiento y eliminación. PSNS e IMF crearían ocho paquetes individuales de compartimientos de reactores para su eliminación en el Sitio de Hanford del Departamento de Energía de los Estados Unidos, utilizando el programa establecido que se ha utilizado para eliminar exitosamente los compartimientos de reactores navales durante más de 30 años.

- Desmantelar parcialmente el ex-Enterprise en una instalación comercial de eliminación retirando partes del barco fuera de los compartimentos del reactor naval. El resto del barco que contiene los compartimientos del reactor naval se transportarían luego al PSNS e IMF para su procesamiento y eliminación. PSNS e IMF crearían cuatro paquetes individuales de compartimientos de reactores para su eliminación en el Sitio de Hanford del Departamento de Energía de los Estados Unidos, utilizando el programa establecido que se ha utilizado para eliminar exitosamente los compartimientos de reactores navales durante más de 30 años. Cada paquete contendría dos de las plantas de reactor del barco, y por lo tanto sería más grande y más pesado que los paquetes que se necesitarían para la eliminación individual de ocho plantas de reactor.

- Desmantelar el ex-Enterprise en una instalación comercial de desmantelamiento de barcos, incluyendo la separación de las ocho plantas de reactores en segmentos para ser empaquetados en varios cientos de pequeños contenedores para su posterior eliminación en instalaciones establecidas de desechos del Departamento de Energía de los Estados Unidos o en instalaciones de desechos comerciales.

La Armada también evaluará la alternativa de No Acción, que implica el almacenamiento a base de agua del ex-Enterprise.

Como resultado de los comentarios recibidos durante la determinación pública del alcance realizada en 2019, la Armada ha incorporado al área de Mobile, Alabama, al área de estudio para esta EIS/OEIS. En cumplimiento de la Ley de política nacional del medioambiente (NEPA, por sus siglas in inglés) de 1969, se abrirá un período adicional de determinación pública del alcance desde el 12 de agosto de 2020 hasta el 11 de septiembre de 2020 para dar lugar a un proceso abierto que se realiza de manera temprana para determinar el alcance de los temas que se deben abordar e identificar los temas significativos relacionados con la acción propuesta. Puede obtener más información sobre el proyecto a través de la ficha técnica y en el sitio web del proyecto, en www.CarrierDisposalEIS.com. Debido a las actuales indicaciones y medidas implementadas a nivel federal y estatal por causa de la COVID-19, la Armada no puede realizar una reunión presencial de determinación pública del alcance en Mobile, Alabama. Para ayudar al público a determinar si corresponde enviar un comentario formal sobre el proyecto, la Armada responderá a las preguntas del público desde el 19 de agosto de 2020 hasta el 2 de septiembre de 2020. Durante este período, el público puede enviar preguntas a la Armada sobre la acción propuesta a la siguiente dirección: info@CarrierDisposalEIS.com. Se espera que las reuniones públicas se realicen después de la publicación del Borrador de la EIS/OEIS el próximo año.

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Figure B-7: Stakeholder Scoping 2020 Notification Letter (Spanish) (continued)

Sus comentarios para identificar los temas e inquietudes específicos que deben analizarse son importantes para el proceso. Puede enviar comentarios, información adicional y cualquier información de contacto actualizada a:

Congressional and Public Affairs Office
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Attn: Kellie Randall, CVN 65 EIS
1400 Farragut Avenue, Stop 2072
Bremerton, WA 98314-2072

También puede enviar sus comentarios en línea en el sitio web del proyecto de la EIS/OEIS de la Armada en www.CarrierDisposalEIS.com. Para ser considerado para el Borrador de la EIS/OEIS, la Armada tiene que recibir los comentarios a más tardar el 11 de septiembre de 2020.

El Departamento de Energía de los Estados Unidos es una agencia cooperante en la preparación de esta EIS/OEIS. El Aviso de Intención de preparación de esta EIS/OEIS de la Armada se encuentra disponible en el sitio web de la Armada mencionado arriba así como en el sitio web de Hanford del Departamento de Energía de los Estados Unidos NEPA, en www.hanford.gov/page.cfm/EnvironmentalImpactStatements. También puede encontrar documentos de apoyo adicionales relacionados con la NEPA en el sitio web de la Armada, incluida la Evaluación Ambiental de 2012 del ex-Enterprise y la EIS de 1996.

Espero trabajar con usted para proporcionarle información adicional que pudiera necesitar y abordar sus inquietudes. Si tiene preguntas o comentarios, no dude en comunicarse con la Sra. Kellie Randall, Oficial de Asuntos Públicos, PSNS e IMF, llamando al (360) 476-7111.

Atentamente,

J. M. AVERY
Director de la División de Asuntos Regulatorios
Programa de Propulsión Nuclear Naval/Reactores Navales

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Figure B-7: Stakeholder Scoping 2020 Notification Letter (Spanish) (continued)

B.2.1.2 Postcard Mailers

A postcard was mailed first-class to 455 tribal staff, media outlets, nongovernmental organizations, and individuals on May 30, 2019. For the reopened scoping period, a postcard was sent on August 10, 2020, to 116 tribal staff, media outlets, nongovernmental organizations, and individuals in the Mobile, Alabama area. The English and Spanish versions of the postcard mailers were made available on the project website and are shown in Figure B-8, Figure B-9, Figure B-10, and Figure B-11.



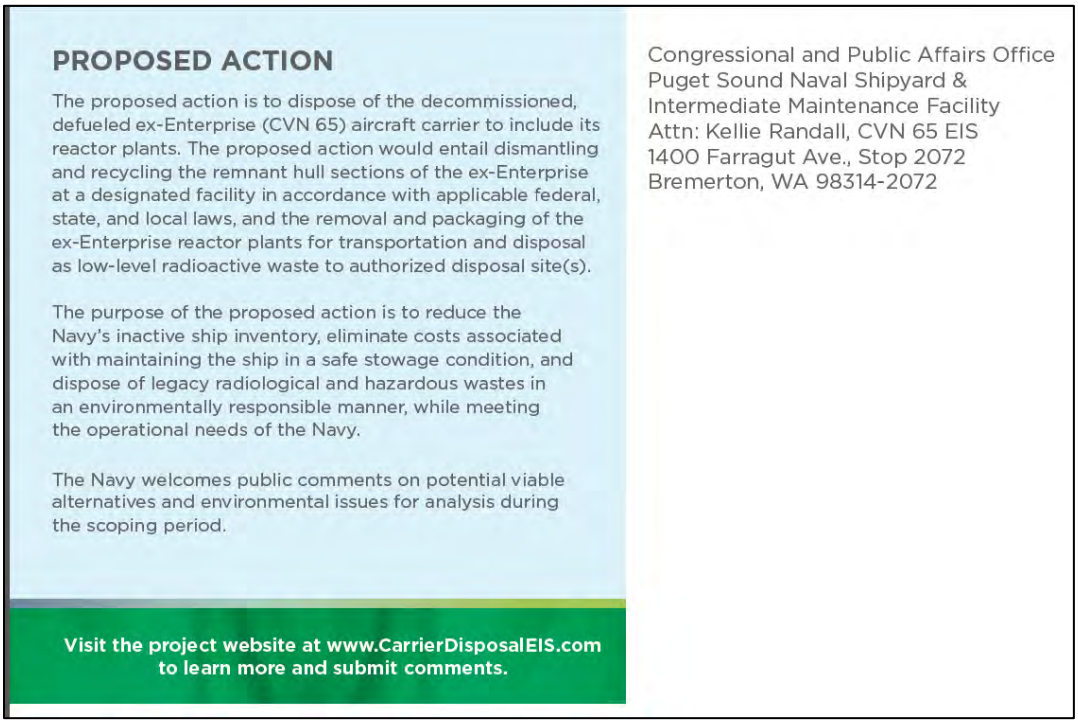
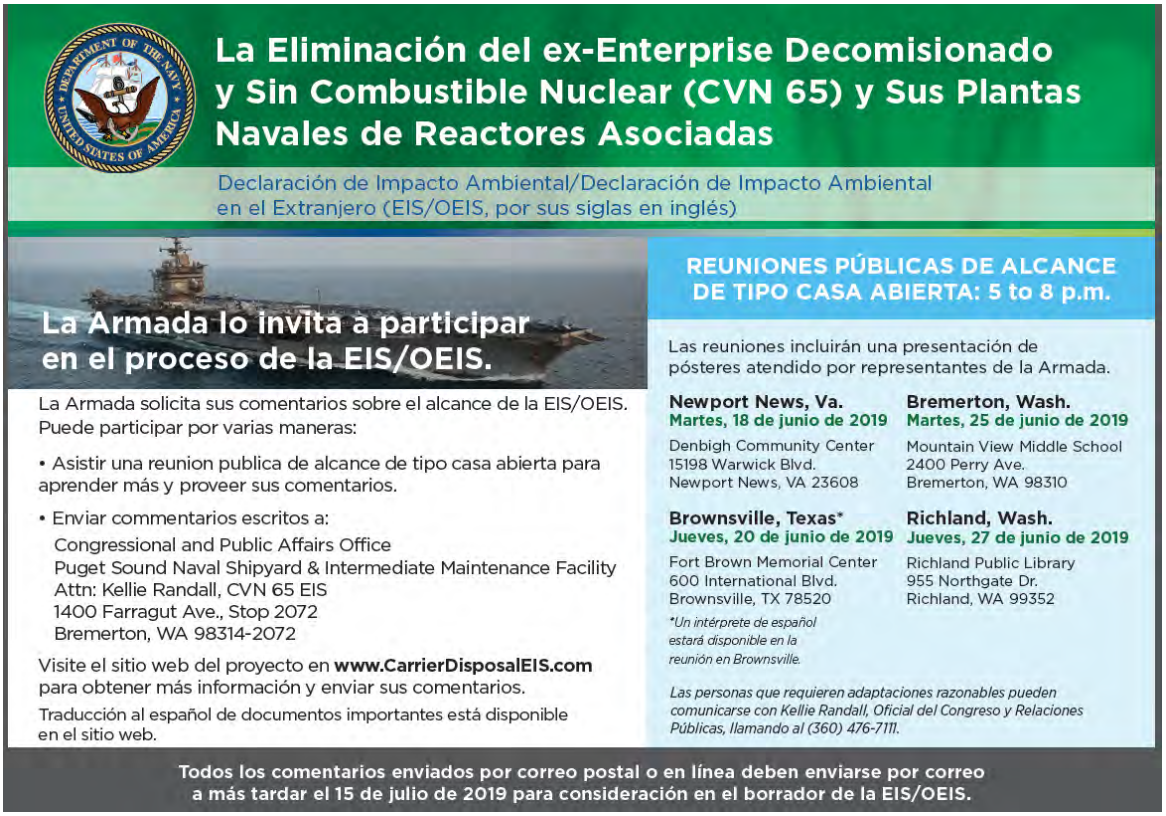


Figure B-8: Postcard Mailer for 2019 Scoping (English) (Front and Back)



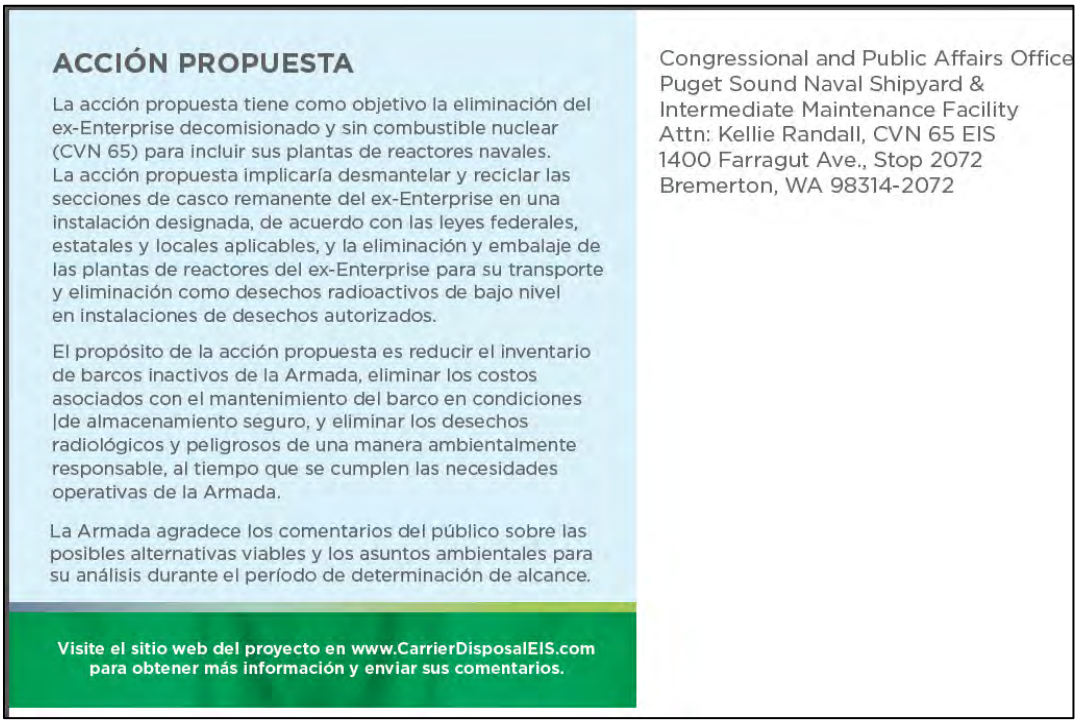
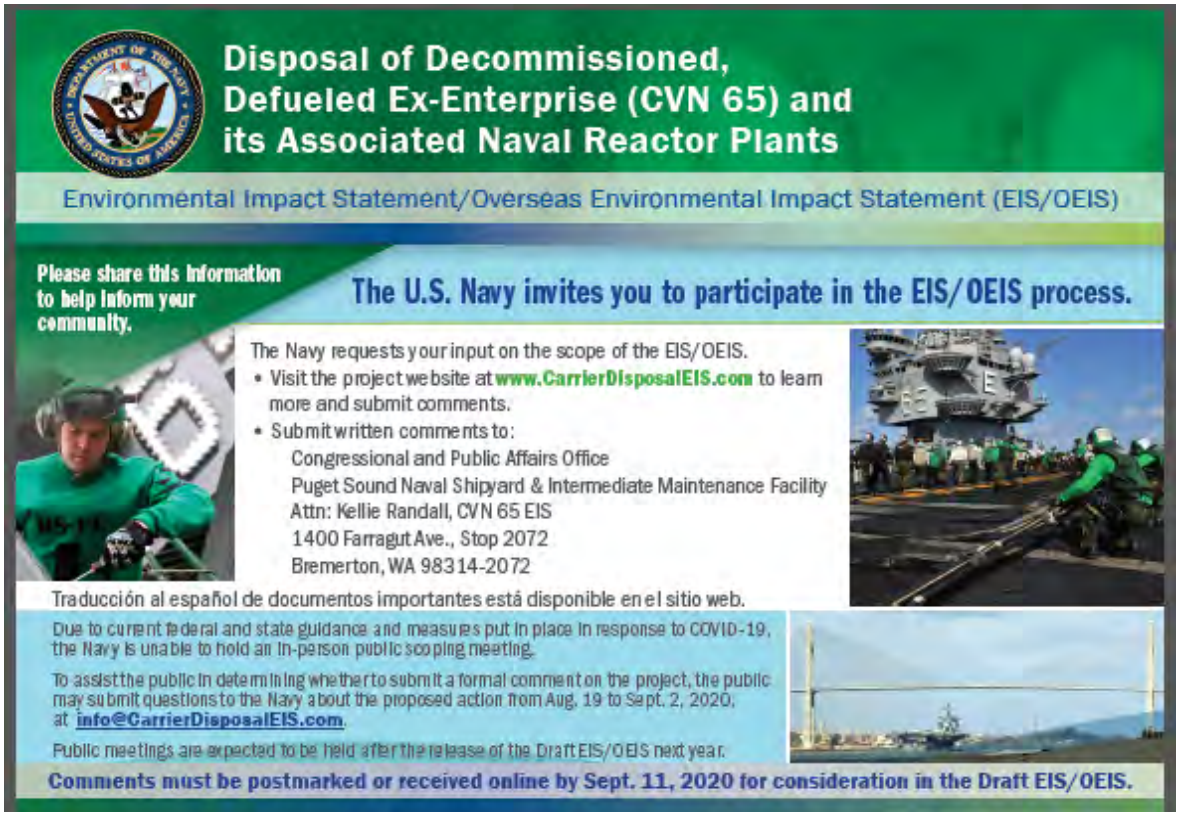


Figure B-9: Postcard Mailer for 2019 Scoping (Spanish) (Front and Back)



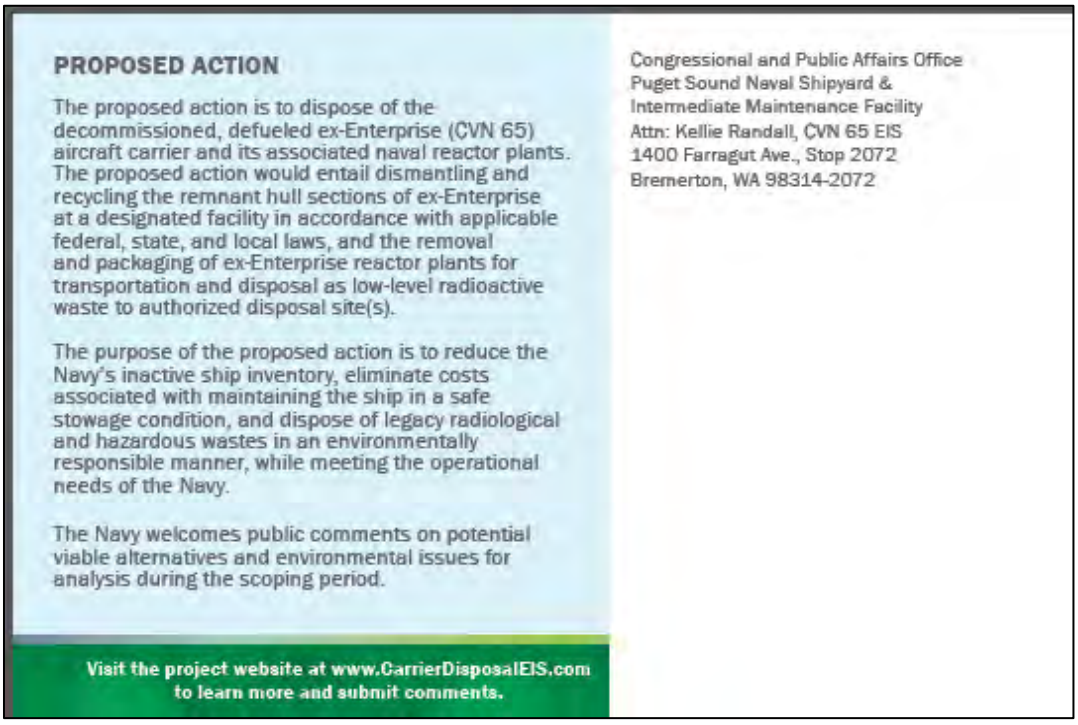


Figure B-10: Postcard Mailer for 2020 Scoping (English) (Front and Back)



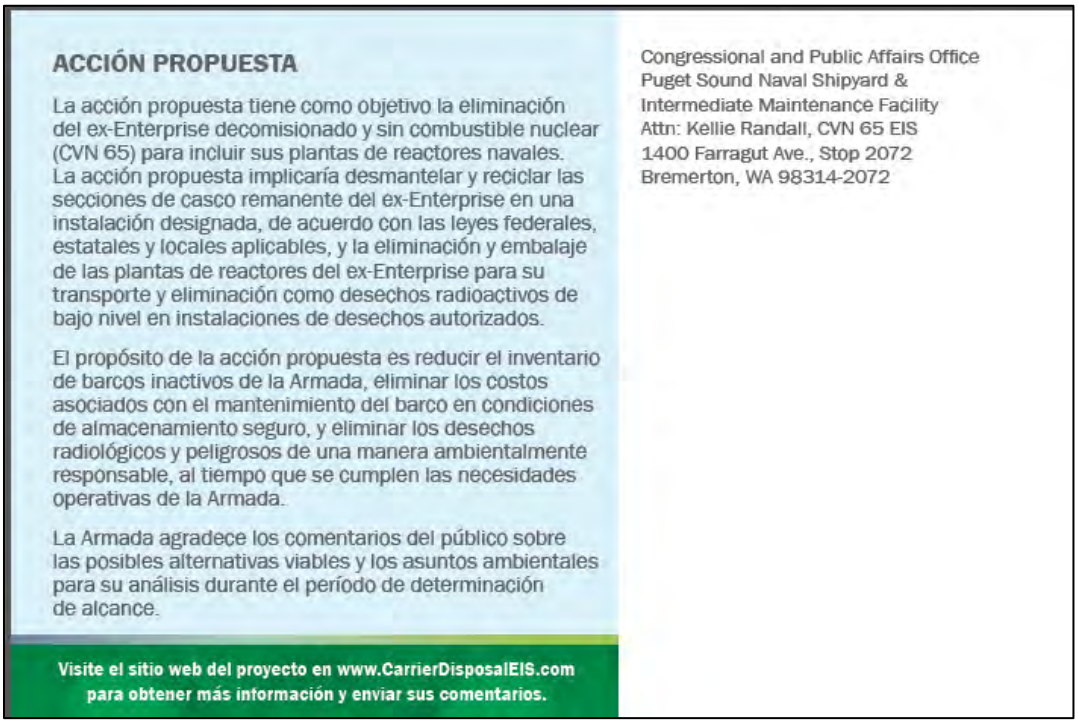


Figure B-11: Postcard Mailer for 2020 Scoping (Spanish) (Front and Back)

B.2.1.3 Newspaper Advertisements

The Navy published display advertisements in local and regional newspapers to announce the 2019 and 2020 scoping periods, the 2019 scoping meetings, and the public's opportunity to comment on the scope of the analysis. The advertisements included a brief description of the Proposed Action; dates, times, and locations of the scoping meetings, the project website address, the duration of the comment period, and information on how to provide comments. The newspapers and publication dates are indicated in Table B-2. An example of the announcement in English and Spanish are shown in Figure B-12, Figure B-13, Figure B-14, and Figure B-15.

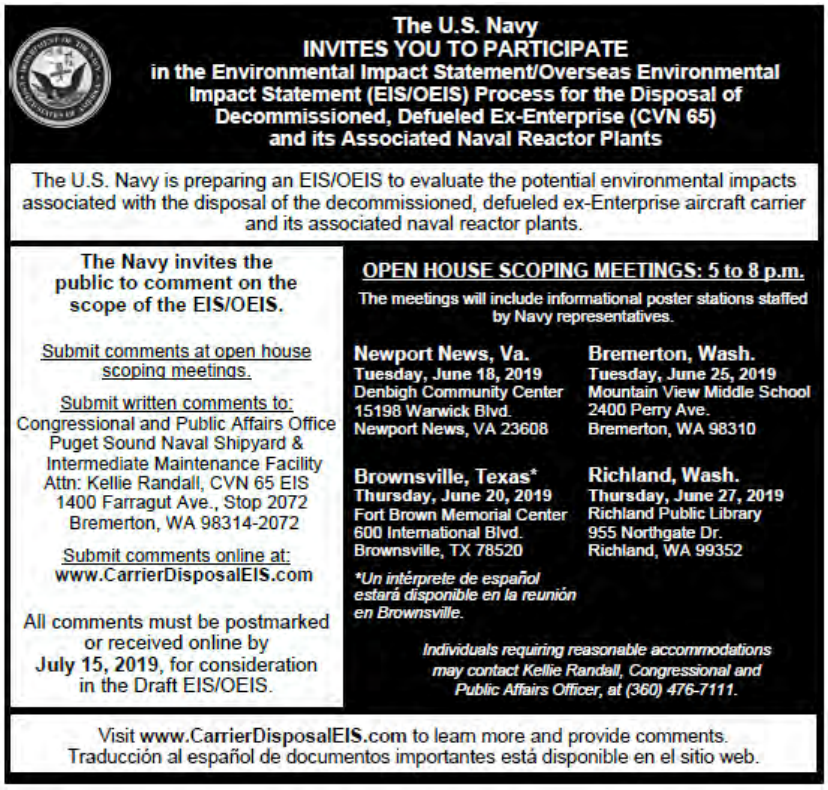
Table B-2: Newspaper Publications During 2019 and 2020 Scoping Phases

Newspaper	Newspaper Coverage	Publication Dates
The Virginian-Pilot	Norfolk, VA	Friday, May 31, 2019 Saturday, June 1, 2019 Sunday, June 2, 2019 Monday, June 10, 2019 Saturday, June 15, 2019
The Daily Press	Norfolk, VA	Friday, May 31, 2019 Saturday, June 1, 2019 Sunday, June 2, 2019 Saturday, June 8, 2019 Saturday, June 15, 2019
Augusta Chronicle	Richmond and Columbia counties, GA; Aiken County, SC	Friday, May 31, 2019 Saturday, June 1, 2019 Sunday, June 2, 2019 Saturday, June 8, 2019 Saturday, June 15, 2019
Aiken Standard	Aiken County, SC	Friday, May 31, 2019 Saturday, June 1, 2019 Sunday, June 2, 2019 Saturday, June 8, 2019 Saturday, June 15, 2019
Brownsville Herald	Brownsville, TX	Friday, May 31, 2019 Saturday, June 1, 2019 Sunday, June 2, 2019 Monday, June 10, 2019 Tuesday, June 18, 2019
El Nuevo Heraldo (Spanish)	Brownsville, TX	Saturday, June 1, 2019 Sunday, June 2, 2019 Monday, June 3, 2019 Monday, June 10, 2019 Tuesday, June 18, 2019
The Seattle Times	King County, WA; Statewide	Friday, May 31, 2019 Saturday, June 1, 2019 Sunday, June 2, 2019 Saturday, June 15, 2019 Saturday, June 22, 2019
The Kitsap Sun	Kitsap County, WA	Friday, May 31, 2019 Saturday, June 1, 2019 Sunday, June 2, 2019 Saturday, June 15, 2019 Sunday, June 23, 2019

Table B-2: Newspaper Publications During 2019 and 2020 Scoping Phases (continued)

Newspaper	Newspaper Coverage	Publication Dates
Tri-City Herald	Tri-County, WA	Friday, May 31, 2019 Saturday, June 1, 2019 Sunday, June 2, 2019 Saturday, June 22, 2019 Sunday, June 23, 2019
The Oregonian	Portland, OR; Statewide	Friday, May 31, 2019 Saturday, June 1, 2019 Sunday, June 2, 2019 Saturday, June 15, 2019 Sunday, June 22, 2019
The Portland Tribune	Portland, OR	Tuesday, June 4, 2019 Thursday, June 6, 2019 Tuesday, June 18, 2019 Thursday, June 20, 2019
Mobile Press-Register	Mobile, AL	Wednesday, Aug. 12, 2020 Friday, Aug. 14, 2020 Sunday, Aug. 16, 2020

Notes: AL = Alabama, GA = Georgia, OR = Oregon, SC = South Carolina, TX = Texas, VA = Virginia, WA = Washington



The U.S. Navy
INVITES YOU TO PARTICIPATE
in the Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) Process for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants

The U.S. Navy is preparing an EIS/OEIS to evaluate the potential environmental impacts associated with the disposal of the decommissioned, defueled ex-Enterprise aircraft carrier and its associated naval reactor plants.

The Navy invites the public to comment on the scope of the EIS/OEIS.

Submit comments at open house scoping meetings.

Submit written comments to:
Congressional and Public Affairs Office
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Attn: Kellie Randall, CVN 65 EIS
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Submit comments online at:
www.CarrierDisposalEIS.com

All comments must be postmarked or received online by **July 15, 2019**, for consideration in the Draft EIS/OEIS.

OPEN HOUSE SCOPING MEETINGS: 5 to 8 p.m.

The meetings will include informational poster stations staffed by Navy representatives.

Newport News, Va.
Tuesday, June 18, 2019
Denbigh Community Center
15198 Warwick Blvd.
Newport News, VA 23608

Bremerton, Wash.
Tuesday, June 25, 2019
Mountain View Middle School
2400 Perry Ave.
Bremerton, WA 98310

Brownsville, Texas*
Thursday, June 20, 2019
Fort Brown Memorial Center
600 International Blvd.
Brownsville, TX 78520

Richland, Wash.
Thursday, June 27, 2019
Richland Public Library
955 Northgate Dr.
Richland, WA 99352

**Un intérprete de español estará disponible en la reunión en Brownsville.*

Individuals requiring reasonable accommodations may contact Kellie Randall, Congressional and Public Affairs Officer, at (360) 476-7111.

Visit **www.CarrierDisposalEIS.com** to learn more and provide comments.
Traducción al español de documentos importantes está disponible en el sitio web.

Figure B-12: Newspaper Announcement of 2019 Scoping (English)



La Armada de los Estados Unidos
lo invita a participar en el proceso
de la Declaración de Impacto Ambiental/Declaración de Impacto Ambiental del Extranjero para la Eliminación del Ex-Enterprise Decomisionado y Sin Combustible Nuclear (CVN 65) y Sus Plantas Navales de Reactores Asociadas

La Armada de los Estados Unidos está preparando una Declaración de Impacto Ambiental/Declaración de Impacto Ambiental en el Extranjero (EIS/OEIS, por sus siglas en inglés) para evaluar los impactos ambientales potenciales asociados con la eliminación del ex-Enterprise decomisionado y sin combustible nuclear (CVN 65), incluyendo sus plantas navales de reactores asociadas.

La Armada invita al público a presentar comentarios sobre el alcance de la EIS/OEIS.

Presente sus comentarios en las reuniones del alcance.

Envíe comentarios escritos a:
Congressional and Public Affairs Office
Puget Sound Naval Shipyard &
Intermediate Maintenance Facility
Attn: Kellie Randall, CVN 65 EIS
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Envíe comentarios en línea:
www.CarrierDisposalEIS.com

Todos los comentarios enviados por correo postal o en línea deben enviarse por correo a más tardar el **15 de julio de 2019** para consideración el borrador de la EIS/OEIS.

REUNIONES DE ALCANCE DE TIPO CASA ABIERTA: 5 a 8 p.m.
Las reuniones incluirán una presentación de pósteres atendido por representantes de la Armada

Newport News, Va.
Martes, 18 de junio de 2019
Denbigh Community Center
15198 Warwick Blvd.
Newport News, VA 23608

Brownsville, Texas*
Jueves, 20 de junio de 2019
Fort Brown Memorial Center
600 International Blvd.
Brownsville, TX 78520

Bremerton, Wash.
Martes, 25 de junio de 2019
Mountain View Middle School
2400 Perry Ave.
Bremerton, WA 98310

Richland, Wash.
Jueves, 27 de junio de 2019
Richland Public Library
955 Northgate Dr.
Richland, WA 99352

**Un intérprete de español estará disponible en la reunión en Brownsville.*

Las personas que requieren adaptaciones razonables pueden comunicarse con Kellie Randall, Oficial del Congreso y Relaciones Públicas al (360) 476-7111.

Visite el sitio web del proyecto en **www.CarrierDisposalEIS.com** para obtener más información y para enviar sus comentarios.
Traducción al español de documentos importantes está disponible en el sitio web.

Figure B-13: Newspaper Announcement of 2019 Scoping (Spanish)



The U.S. Navy
INVITES YOU TO PARTICIPATE
in the Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) Process for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants

The U.S. Navy is preparing an EIS/OEIS to evaluate the potential environmental impacts associated with the disposal of the decommissioned, defueled ex-Enterprise aircraft carrier and its associated naval reactor plants.

The Navy invites the public to comment on the scope of the EIS/OEIS.

- Submit written comments to:
  Congressional and Public Affairs Office
  Puget Sound Naval Shipyard &
  Intermediate Maintenance Facility
  Attn: Kellie Randall, CVN 65 EIS
  1400 Farragut Ave., Stop 2072
  Bremerton, WA 98314-2072
- Submit comments online at:
  www.CarrierDisposalEIS.com

All comments must be postmarked or received online by **Sept. 11, 2020** for consideration in the Draft EIS/OEIS.

Please share this information to help inform your community.

Due to current federal and state guidance and measures put in place in response to COVID-19, the Navy is unable to hold an in-person public scoping meeting.

To assist the public in determining whether to submit a formal comment on the project, questions may be submitted from Aug. 19 to Sept. 2, 2020, at **info@CarrierDisposalEIS.com**.

Public meetings are expected to be held after the release of the Draft EIS/OEIS next year.

Visit **www.CarrierDisposalEIS.com** to learn more and provide comments.
Traducción al español de documentos importantes está disponible en el sitio web.

Figure B-14: Newspaper Announcement of 2020 Scoping (English)



Figure B-15: Newspaper Announcement of 2020 Scoping (Spanish)

B.2.1.4 News Releases

Puget Sound Naval Shipyard & Intermediate Maintenance Facility Public Affairs Office distributed a news release to regional media outlets to coincide with the release of the Notice of Intent on May 31, 2019. A second news release was distributed to media outlets on June 13, 2019, five days prior to the start of the public meetings. Spanish versions of the news releases were distributed to media in the Brownsville, Texas area. On August 12, 2020, a news release was distributed to local and regional media outlet announcing the reopening of the scoping period.

Public service announcements for the Newport News, Virginia, and Brownsville, Texas, areas were distributed on June 13, 2019. Public service announcements for the Bremerton, Washington, and Richland, Washington, areas were distributed on June 20, 2019.

News releases and an example of the public service announcement are shown in Figure B-16, Figure B-17, Figure B-18, and Figure B-19.

Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Congressional and Public Affairs Office
1400 Farragut Avenue
Bremerton, WA 98314-5001
(360) 476-7111 Fax: (360) 476-0937
psns.pao.fct@navy.mil

Release No: 008-19
May 31, 2019

Navy to prepare an Environmental Impact Statement/Overseas Environmental Impact Statement for the disposal of the decommissioned, defueled ex-Enterprise (CVN 65) and its associated naval reactor plants

BREMERTON, Washington – The U.S. Navy is preparing an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate the potential environmental impacts associated with the disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier, including its naval reactor plants.

The proposed action is to dispose of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier to include its reactor plants. The proposed action would entail dismantling and recycling the remnant hull sections of the ex-Enterprise at a designated facility in accordance with applicable federal, state, and local laws, and the removal and packaging of the ex-Enterprise reactor plants for transportation and disposal as low-level radioactive waste to authorized disposal site(s).

The purpose of the proposed action is to reduce the Navy's inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy.

Public Open House Scoping Meetings
The public is invited to attend open house scoping meetings to learn about the proposal and submit comments on the scope of the EIS/OEIS, including potential viable alternatives and environmental issues for analysis. Meetings will be held in an open-house format, with poster displays and subject matter experts available for questions.

Four open house scoping meetings will be held from **5 to 8 p.m.** at the following locations.

Virginia: **Tuesday, June 18, 2019**
Denbigh Community Center
15198 Warwick Blvd.
Newport News, VA 23608

Figure B-16: Puget Sound Naval Shipyard & Intermediate Maintenance Facility 2019 News Releases (English)

Texas: **Thursday, June 20, 2019***
Fort Brown Memorial Center
600 International Blvd.
Brownsville, TX 78520
**Un intérprete de español estará disponible en la reunión en Brownsville.*

Washington: **Tuesday, June 25, 2019**
Mountain View Middle School
2400 Perry Ave.
Bremerton, WA 98310

Thursday, June 27, 2019
Richland Public Library
955 Northgate Dr.
Richland, WA 99352

Individuals requiring reasonable accommodations may contact Kellie Randall, Congressional and Public Affairs Officer, at (360) 476-7111.

Traducción al español de documentos importantes está disponible en el sitio web.

Public Comments
The Navy welcomes public comments on potential viable alternatives and environmental issues for analysis during the scoping period. Comments may be submitted via mail, online, or at the scoping meetings. All comments must be postmarked or received online by **July 15, 2019,** for consideration in the Draft EIS/OEIS.

Mail:
Congressional and Public Affairs Office
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Attn: Kellie Randall, CVN 65 EIS
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Online: **www.CarrierDisposalEIS.com**

Visit the project website at **www.CarrierDisposalEIS.com** to learn more and submit comments.

MEDIA AVAILABILITY: There is an opportunity for media to speak with senior Navy leaders at 4:30 p.m. before each meeting. Media interested in attending or seeking further information should contact Kellie Randall, Congressional and Public Affairs Officer, (360) 476-7111.

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Figure B-16: Puget Sound Naval Shipyard & Intermediate Maintenance Facility 2019 News Releases (English) (continued)

**Puget Sound Naval Shipyard
& Intermediate Maintenance Facility**
Congressional and Public Affairs Office
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072
(360) 476-7111 Fax: (360) 476-0937
psns.pao.fct@navy.mil

Release No: 016-19
June 20, 2019

Navy to hold public scoping meetings for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants Environmental Impact Statement/Overseas Environmental Impact Statement

BREMERTON, Washington – The public is invited to attend open house scoping meetings to learn about an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) being prepared for the disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier, including its naval reactor plants. The U.S. Navy is seeking public input and involvement, which are fundamental aspects of the EIS/OEIS development process under the National Environmental Policy Act.

Scoping meetings will provide the public with the opportunity to receive project-related information, ask questions of Navy representatives, and submit comments on the scope of the EIS/OEIS, including potential viable alternatives and environmental issues for analysis. Meetings will be held in an open-house format with poster displays and subject matter experts available for questions.

Four open house scoping meetings will be held from **5 to 8 p.m.** at the following locations.

Virginia:	**Tuesday, June 18, 2019** Denbigh Community Center 15198 Warwick Blvd. Newport News, VA 23608
Texas:	**Thursday, June 20, 2019*** Fort Brown Memorial Center 600 International Blvd. Brownsville, TX 78520 **Un intérprete de español estará disponible en la reunión en Brownsville.*
Washington:	**Tuesday, June 25, 2019** Mountain View Middle School 2400 Perry Ave. Bremerton, WA 98310

Figure B-16: Puget Sound Naval Shipyard & Intermediate Maintenance Facility 2019 News Releases (English) (continued)

Thursday, June 27, 2019
Richland Public Library
955 Northgate Dr.
Richland, WA 99352

Individuals requiring reasonable accommodations may contact Kellie Randall, Congressional and Public Affairs Officer, at (360) 476-7111.

Traducción al español de documentos importantes está disponible en el sitio web.

Public Comments
The Navy welcomes public comments on potential viable alternatives and environmental issues for analysis during the scoping period. Comments may be submitted via mail, online, or at the scoping meetings. All comments must be postmarked or received online by **July 15, 2019,** for consideration in the Draft EIS/OEIS.

Mail:
Congressional and Public Affairs Office
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Attn: Kellie Randall, CVN 65 EIS
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Online: **www.CarrierDisposalEIS.com**

Proposed Action
The proposed action is to dispose of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier to include its reactor plants. The proposed action would entail dismantling and recycling the remnant hull sections of the ex-Enterprise at a designated facility in accordance with applicable federal, state, and local laws, and the removal and packaging of the ex-Enterprise reactor plants for transportation and disposal as low-level radioactive waste to authorized disposal site(s).

The purpose of the proposed action is to reduce the Navy's inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy.

Visit the project website at **www.CarrierDisposalEIS.com** to learn more or submit comments.

MEDIA AVAILABILITY: There is an opportunity for media to speak with senior Navy leaders at 4:30 p.m. before each meeting. Media interested in attending or seeking further information should contact Kellie Randall, Congressional and Public Affairs Officer, (360) 476-7111.

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Figure B-16: Puget Sound Naval Shipyard & Intermediate Maintenance Facility 2019 News Releases (English) (continued)

Puget Sound Naval Shipyard
& Intermediate Maintenance Facility
Congressional and Public Affairs Office
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072
(360) 476-7111 Fax: (360) 476-0937
psns.pao.fct@navy.mil

Release No: 013-20
August 12, 2020

Navy to reopen public scoping period for the disposal of decommissioned, defueled ex-Enterprise (CVN 65) and its associated naval reactor plants Environmental Impact Statement/Overseas Environmental Impact Statement

BREMERTON, Washington – The U.S. Navy is reopening the public scoping period to all interested parties for the Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) being prepared for the disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier and its associated naval reactor plants. The Navy has added Mobile, Alabama as a potential location for commercial dismantlement based on public scoping comments received during the initial scoping phase in 2019. The public scoping period is open from **Aug. 12 to Sept. 11, 2020**.

Public Comments

The Navy is seeking public input and involvement, which are fundamental aspects of the EIS/OEIS development process under the National Environmental Policy Act. The Navy welcomes public comments on potential viable alternatives and environmental issues for analysis during the scoping period. Comments may be submitted via mail or online. It is not necessary to resubmit scoping comments already made if the comments have not changed. Comments must be postmarked or received online by **Sept. 11, 2020**, for consideration in the Draft EIS/OEIS.

Mail:
Congressional and Public Affairs Office
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Attn: Kellie Randall, CVN 65 EIS
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Online: **www.CarrierDisposalEIS.com**

Figure B-17: Puget Sound Naval Shipyard & Intermediate Maintenance Facility 2020 News Release (English)

Public Questions

Due to current federal and state guidance and measures put in place in response to COVID-19, the Navy is unable to hold an in-person public scoping meeting in Mobile, Alabama. To assist the public in determining whether to submit a formal comment on the project, the Navy will respond to questions from the public from **Aug. 19 to Sept. 2, 2020**. During this period, the public may submit questions to the Navy about the proposed action at **info@CarrierDisposalEIS.com**.

Proposed Action

The proposed action is to dispose of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier and its associated naval reactor plants. The proposed action would entail dismantling and recycling the remnant hull sections of ex-Enterprise at a designated facility in accordance with applicable federal, state, and local laws, and the removal and packaging of ex-Enterprise reactor plants for transportation and disposal as low-level radioactive waste to authorized disposal site(s).

The purpose of the proposed action is to reduce the Navy's inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy.

Visit the project website at **www.CarrierDisposalEIS.com** to learn more or submit comments.

Traducción al español de documentos importantes está disponible en el sitio web.

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Figure B-17: Puget Sound Naval Shipyard & Intermediate Maintenance Facility 2020 News Release (English) (continued)

Astillero Naval de Puget Sound
e Instalación de Mantenimiento Intermedio
Oficina del Congreso y Relaciones Públicas
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072
(360) 476-7111 Fax: (360) 476-0937
psns.pao.fct@navy.mil

Comunicado de prensa N.°: 013-20
12 de agosto de 2020

La Armada reabrirá el período de determinación pública del alcance para la Declaración de Impacto Ambiental/Declaración de Impacto Ambiental en el Extranjero (EIS/OEIS, por sus siglas en inglés) sobre la eliminación del ex-Enterprise decomisionado y sin combustible nuclear (CVN 65) y sus plantas de reactores navales asociadas

BREMERTON, Washington - La Armada de los Estados Unidos está reabriendo el período de determinación pública a todas las partes interesadas para la Declaración de Impacto Ambiental/Declaración de Impacto Ambiental en el Extranjero (EIS/OEIS) para evaluar los posibles impactos ambientales relacionados con la eliminación del portaaviones ex-Enterprise decomisionado y sin combustible nuclear (CVN 65) y sus plantas de reactores navales asociadas. La Armada ha incorporado a Mobile, Alabama, como una ubicación posible para el desmantelamiento comercial conforme a los comentarios de determinación pública del alcance recibidos durante la fase inicial de determinación del alcance realizada en 2019. El período de determinación pública del alcance permanecerá abierto desde el **12 de agosto hasta el 11 de septiembre de 2020**.

Comentarios Públicos

La Armada busca contar con los comentarios y la participación del público, los cuales son aspectos fundamentales del proceso de desarrollo de la EIS/OEIS de conformidad con la Ley de Política Nacional del Medioambiente. La Armada aprecia los comentarios públicos sobre las alternativas viables posibles y los temas ambientales para análisis durante el período de determinación del alcance. Los comentarios se pueden enviar por correo postal o en línea. No es necesario volver a enviar los comentarios sobre determinación del alcance ya realizados si estos no han cambiado. Los comentarios deberán enviarse por correo postal o en línea a más tardar el **11 de septiembre de 2020** para su consideración en el Borrador de la EIS/OEIS.

Figure B-18: Puget Sound Naval Shipyard & Intermediate Maintenance Facility 2020 News Release (Spanish)

Correo postal:
Congressional and Public Affairs Office
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
Attn: **Kellie Randall**, *CVN 65 EIS*
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

En línea: **www.CarrierDisposalEIS.com**

Preguntas públicas
Debido a las actuales indicaciones y medidas implementadas a nivel federal y estatal por causa de la COVID-19, la Armada no puede realizar una reunión presencial de determinación pública del alcance en Mobile, Alabama. Para ayudar al público a determinar si corresponde enviar un comentario formal sobre el proyecto, la Armada responderá a las preguntas del público desde el **19 de agosto hasta el 2 de septiembre de 2020**. Durante este período, el público puede enviar preguntas a la Armada sobre la acción propuesta a la siguiente dirección: **info@CarrierDisposalEIS.com.**

Acción Propuesta
La acción propuesta es eliminar el portaaviones ex-Enterprise decomisionado y sin combustible nuclear (CVN 65) y sus plantas de reactores navales asociadas. La acción propuesta implicará el desmantelamiento y el reciclaje de las secciones del casco remanente del ex-Enterprise en una instalación designada de conformidad con las correspondientes leyes federales, estatales y locales, y la remoción y separación en paquetes de las plantas de reactores del ex-Enterprise para su transporte y eliminación como residuo radioactivo de bajo nivel en un sitio de eliminación autorizado.

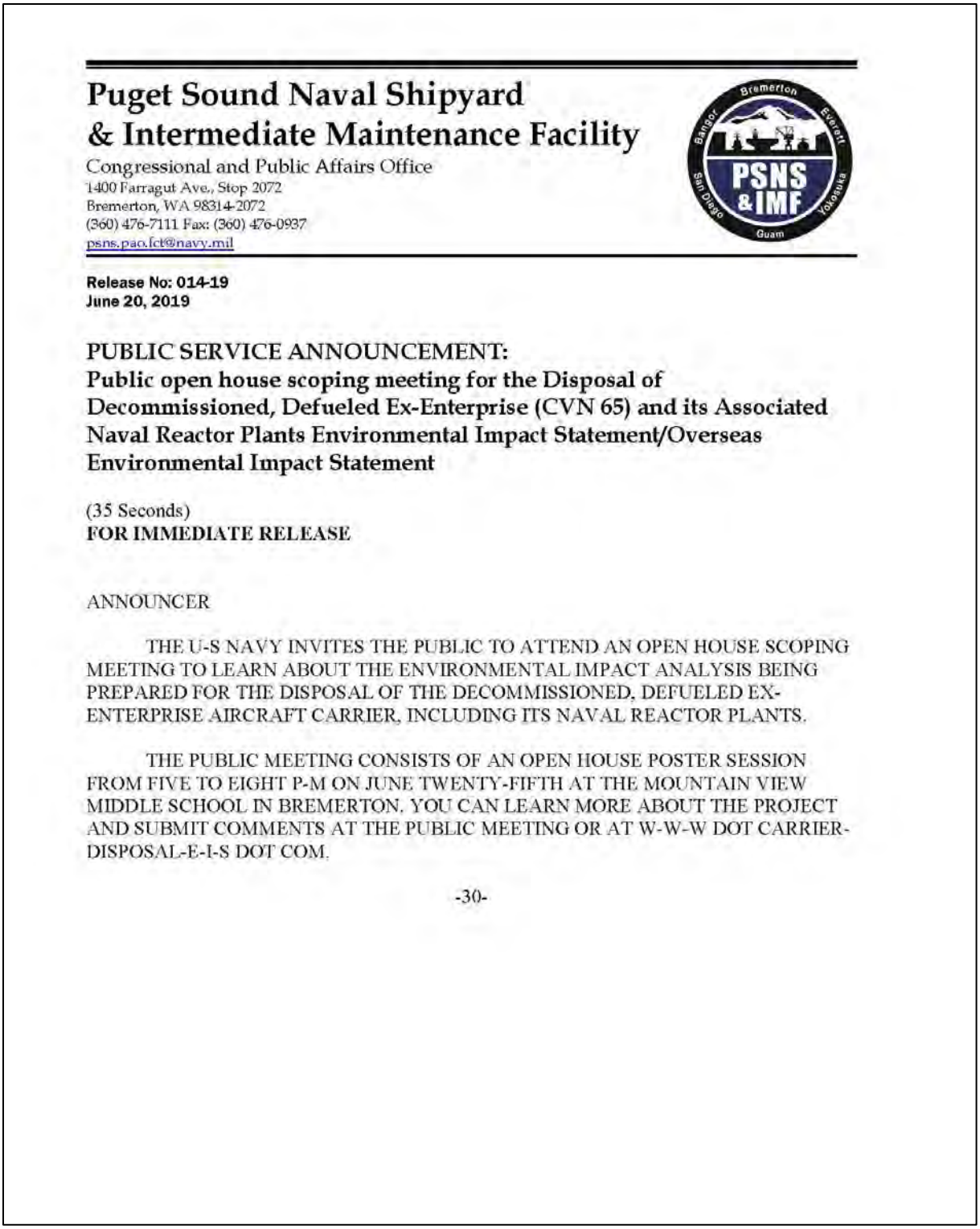
El objetivo de la acción propuesta es reducir el inventario de buques inactivos de la Armada, eliminar los costos asociados con el mantenimiento de buques en condiciones de almacenamiento seguro y eliminar los residuos peligrosos y de legado radiológico de manera responsable con el medio ambiente, a la vez que se da cumplimiento a las necesidades operativas de la Armada.

Visite el sitio web del proyecto en **www.CarrierDisposalEIS.com** para obtener más información o enviar comentarios.

Traducción al español de documentos importantes está disponible en el sitio web.

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Figure B-18: Puget Sound Naval Shipyard & Intermediate Maintenance Facility 2020 News Release (Spanish) (continued)



**Puget Sound Naval Shipyard
& Intermediate Maintenance Facility**

Congressional and Public Affairs Office
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072
(360) 476-7111 Fax: (360) 476-0937
psns.pao.fct@navy.mil

Release No: 014-19
June 20, 2019

PUBLIC SERVICE ANNOUNCEMENT:
Public open house scoping meeting for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants Environmental Impact Statement/Overseas Environmental Impact Statement

(35 Seconds)
FOR IMMEDIATE RELEASE

ANNOUNCER

THE U-S NAVY INVITES THE PUBLIC TO ATTEND AN OPEN HOUSE SCOPING MEETING TO LEARN ABOUT THE ENVIRONMENTAL IMPACT ANALYSIS BEING PREPARED FOR THE DISPOSAL OF THE DECOMMISSIONED, DEFUELED EX-ENTERPRISE AIRCRAFT CARRIER, INCLUDING ITS NAVAL REACTOR PLANTS.

THE PUBLIC MEETING CONSISTS OF AN OPEN HOUSE POSTER SESSION FROM FIVE TO EIGHT P-M ON JUNE TWENTY-FIFTH AT THE MOUNTAIN VIEW MIDDLE SCHOOL IN BREMERTON. YOU CAN LEARN MORE ABOUT THE PROJECT AND SUBMIT COMMENTS AT THE PUBLIC MEETING OR AT W-W-W DOT CARRIER-DISPOSAL-E-I-S DOT COM.

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Figure B-19: Puget Sound Naval Shipyard & Intermediate Maintenance Facility 2019 Example Public Service Announcement

B.2.2 Public Scoping Meetings

The Navy held four public meetings from June 18, 2019, through June 27, 2019, at locations listed in Table B-3. Each public meeting was held in an open-house-style format, with informational poster stations staffed by Navy representatives and an opportunity to provide written and oral comments. Each meeting was three hours in duration.

Staff at the welcome station greeted guests and encouraged meeting attendees to sign in to be added to the project mailing list. A fact sheet booklet and comment form were distributed to attendees, along with verbal direction on the general flow of the poster stations and commenting methods. Spanish versions of all project materials were made available for the public meeting in Brownsville, Texas. A Spanish language interpreter was also present to assist with in-person translation for any Spanish-speaking attendees.

B.2.2.1 Meetings Summary

Table B-3 summarizes the scoping meetings held from June 18, 2019, through June 27, 2019. In total, 125 people attended the four public meetings. Nine written comments and no oral comments were submitted during the public meetings.

Table B-3: Summary of Public Scoping Meetings

Site	Attendance	Oral Comments	Written Comments
Newport News, Virginia *Denbigh Community Center* 15198 Warwick Blvd. Tuesday, June 18, 2019; 5 p.m. to 8 p.m.	30	0	6
Media Attendance • WTKR News 3 (CBS affiliate) • The Daily Press			
Attendees • Modern American Recycling and Repair • Huntington Ingalls Industry (3) • Huntington Ingalls Industry Newport News Shipyard • Newport News Shipyard • SAIC • BWX Technologies • community members			
Site	**Attendance**	**Oral Comments**	**Written Comments**
Brownsville, Texas *Texas Southernmost College* *Fort Brown Memorial Center* 600 International Blvd. Thursday, June 20, 2019; 5 to 8 p.m.	30	0	2

Table B-3: Summary of Public Scoping Meetings (continued)

Site	Attendance	Oral Comments	Written Comments
Media Attendance • The Brownsville Herald			
Attendees • Texas Department of State Health Services (2) • Brownsville Police Department • Brownsville Fire Department • Texas General Land Office • City of Brownsville (3) • City of Brownsville, City Manager's Office • Port of Brownsville • Brownsville Independent School District Superintendent • International Ship Breaking Limited • Huntington Ingalls Industry • Jacobi Consulting • Scrap Metal Services (2) • Steel Coast (3) • Merlion Advisory • Atkins Engineering • Wingreen Marine • Child Care Education Institute • community members			
Site	**Attendance**	**Oral Comments**	**Written Comments**
Bremerton, Washington *Mountain View Middle School* 2400 Perry Ave. Tuesday, June 25, 2019; 5 p.m. to 8 p.m.	46	0	0
Media Attendance • The Kitsap Sun			
Attendees • Office of Congressman Derek Kilmer • General Dynamics/NASSCO • Huntington Ingalls Industry • Puget Sound Naval Association • Puget Sound Ship Repair Association • Bremerton-Olympic Peninsula Council Navy League (2) • International Federation of Professional and Technical Engineers (IFPTE) Local 12 Union (3) • community members			
Site	**Attendance**	**Oral Comments**	**Written Comments**
Richland, Washington *Richland Public Library* 955 Northgate Dr. Tuesday, Dec. 11, 2018; 5 to 8 p.m.	19	0	1
Media Attendance • KNDU 25 (NBC affiliate)			
Attendees • State of Oregon • Washington State Department of Ecology • Washington State Department of Health/Northwest Interstate Compact • AECOM • Tri-City Industrial Council • community members			

B.2.3 Public Scoping Comments

Scoping comments were submitted in the following ways:

- written or oral comments submitted in-person during the 2019 public scoping meetings
- written comment by mail
- written comments via the project website

The Navy received 120 comments from the public during the 2019 public scoping phase, and 34 comments during the 2020 public scoping phase. While public comments received during the scoping periods were considered in the development of the Draft EIS/OEIS, the Draft EIS/OEIS does not specifically respond to or address public comments individually from the public scoping periods.

Several public concerns or recommendations were not addressed in this EIS/OEIS because they did not meet the selection criteria to be carried forward as alternatives. For example, in accordance with Office of the Chief of Naval Operations Instruction 4770.5J, General Policy for the Inactivation, Retirement, and Disposition of U.S. Naval Vessels, dismantling is the only method approved for the disposition of nuclear-powered ships stricken from the Naval Vessel Register. This policy prohibits turning ex-Enterprise into a museum or other memorial. See Section 2.5 (Alternatives Considered but Not Carried Forward for Detailed Analysis) for other alternatives not analyzed further.

The following issues or concerns were raised during the two scoping periods:

B.2.3.1 Dismantlement/Disposal

- support for not dismantling the ex-Enterprise due to its historic significance
- recommendation to use the decommissioned, defueled ex-Enterprise for various future scientific or economic benefit, educational purposes, and tourism attraction
- concern about dismantling the ex-Enterprise due to its history with the Navy
- concern about the cost of dismantling the ex-Enterprise
- concern about dismantling the ex-Enterprise in an area that has already been impacted by natural disasters and accidents causing both environmental damage and human tragedies
- concern about dismantling the ex-Enterprise when other locations would be closer to existing, authorized disposal site(s) for reactor storage
- general support for Mobile, Alabama, as a potential location for commercial dismantlement, and support for the skilled industrial workforce in Mobile, especially steel production facilities and infrastructure required for dismantlement
- questions about whether parts of the vessel could be used as underwater artificial reef, and what will happen to the parts of the ship not containing the reactor compartment
- request for details on how the Navy would address extreme storm surges and winds during tropical and non-tropical weather events that can affect ship repairs and dismantlement
- request the Navy have measures in place to deal with the potential costs and cleanup from a worst-case scenario incident
- request preparation of a detailed plan for remediating the dismantlement site for radiation and any other hazardous materials

- general concern for contractors and sub-contractors to be hired – records of non-compliance, valid licenses, proper trainings, financial stability, insurance coverage, available technology, and industry expertise
- questions about where the dismantlement would occur
- questions about the timelines for both full and partial dismantlement
- questions about who would be responsible for altering the berth area for storage of the ex-Enterprise, if required
- questions about who would be responsible for disposing of the dismantled parts and liquid from the naval reactor plants
- request for the Navy to create a panel of local subject matter experts to provide oversight, transparency, and safety assurances
- request for auditors and other independent entities to perform quality control checks and oversight of contractors performing dismantlement and transportation work
- questions about what would be removed from the ex-Enterprise, specifically the amount of "trapped liquids"

B.2.3.2 Air Quality

- concern about controlling particulate/dust drift and spread during naval reactor dismantlement
- recommendation to implement measures, such as Best Management Practices, to reduce fugitive dust particulates and equipment emissions
- request the Navy analyze impacts on air quality, including radionuclide emissions, and identify mitigation measures to reduce air pollutants and emissions

B.2.3.3 Water Quality/Resources

- request to prohibit dewatering into Mobile Bay and any other surface waters to prevent potential for any spread of radioactivity
- questions about how the dismantlement would impact local waterways/delta and fisheries
- request the Navy include plans for groundwater contamination remedial activities to meet Washington State Model Toxics Control Act, Environmental Protection Act, and tribal standards for drinking and surface water quality
- request the Navy identify water bodies that do not meet water quality standards and develop water quality restoration plans to meet established water quality criteria and associated beneficial uses
- request the Navy identify aquatic resources, such as habitat types, wetlands, etc., analyze the potential impacts of dredged or fill materials into surface waters and floodplain impacts, and develop mitigation plans, including compensatory mitigation

B.2.3.4 Transportation

- request the Navy identify transportation routes of radioactive and hazardous materials
- questions about how transit of the ex-Enterprise through Mobile Bay would affect shipping traffic in the Bay

- questions whether specific restrictions to shipping or boating traffic would be required during transit

B.2.3.5 Public Health and Safety

- questions whether safety protocols similar to those implemented for the ex-STURGIS floating reactor barge would be followed
- questions pertaining to the integration of local first responders into the dismantling project, and whether specialized training would occur for those first responders

B.2.3.6 Radioactive/Hazardous Materials and Waste Management

- request for Navy transparency of the risks during transportation of any radioactive or hazardous material, and how those working with these materials would be protected
- concern about precautions taken to prevent the release of radioactive materials during a hurricane or tropical storm
- request for a clear plan for radiation detection
- questions about security measures to ensure no radioactive materials leave the worksite
- questions about whether an emergency response team would be established to contain and clean any unforeseen radioactive spill
- questions about the implementation of spill barriers to reduce the risk of radioactive material that may be trapped in pipes, valves, and exchangers
- questions about the measures to be implemented to alert the public if there is an incident involving radioactive parts, materials, liquids, or gases
- questions whether monitors would be installed to provide early warnings of high radioactive levels
- recommendation for the Navy to identify potential hazardous materials within the vicinity of the proposed project (Mobile Bay area contains facilities of concern with regard to hazardous materials and also has a number of underground storage tank incident sites)
- concern about additional waste disposal at already contaminated areas, which could lead to leaching and contamination of surrounding soils, groundwater, and the Columbia River
- request the Navy analyze the potential impacts from exposure to hazardous waste, potential pathways, and periods of exposure

B.2.3.7 Sediments

- request the Navy take sediment samples prior to dismantling, regularly during operations, and post-completion for radioactive contamination and that the analysis be provided to the U.S. Army Corps of Engineers

B.2.3.8 Mitigation

- request the Navy evaluate potential impacts on natural resources and identify all necessary measures to avoid, minimize, and mitigate those impacts
- request the Navy include an environmental inspection and mitigation monitoring program to ensure compliance with all mitigation measures and assess their effectiveness

B.2.3.9 Socioeconomics

- concerns that bringing in an aircraft carrier with naval reactor plants could further reduce tourism to an already impacted area
- request to use the ex-Enterprise as a museum, restaurant, or retirement home for veterans or to boost tourism in the area
- general support for the project because of the significant number of jobs it would bring to the region

B.2.3.10 National Environmental Policy Act Process/Community Involvement

- questions about how the Navy would communicate and engage with the public during the EIS/OEIS process
- questions about whether virtual meetings in Mobile, Alabama, would be considered if COVID-19 conditions continue to prohibit in-person interactions
- accolades for inclusion of the local community in the EIS/OEIS process
- request the Navy provide a detailed cumulative impacts assessment
- request the Navy clearly present the government-to-government consultation process in the Draft EIS/OEIS
- request the Navy identify environmental justice populations around or near the disposal facilities and address the potential disproportionate adverse impacts on those populations
- request the Navy provide a list of all permits/authorizations that project facilities have or will need to acquire, including modifications to any existing permits or authorizations

B.2.3.11 Other

- accolades for Navy environmental stewardship efforts, safety procedures, and safety record
- concern the proposed facility sites may be within a tectonically active area, and that the proposed activities could cause or be affected by increased seismic activity
- request the Navy include an analysis of the impacts the changing climate may have on the proposed project and areas

B.3 Draft Environmental Impact Statement/Overseas Environmental Impact Statement Public Review and Comment Period

The 45-day public review and comment period for the Draft EIS/OEIS began with the publication of the Notice of Availability and Notice of Virtual Public Meetings in the FR (87 FR 51068) on August 19, 2022. The public review and comment period for the Draft EIS/OEIS ran from August 19, 2022, to October 3, 2022. The FR notice included notification of availability of the Draft EIS/OEIS and where it could be accessed; an overview of the Proposed Action and alternatives; its purpose and need; virtual public meeting information, including how to submit questions; and public commenting information. Public comments were accepted by mail and via the project website at www.carrierdisposaleis.com. The FR notice can be found in Appendix A (Federal Register Notices). Public comments received and responses to comments can be found in Appendix C (Public Comments and Responses).

The purpose of public involvement and outreach during the public review and comment period of the Draft EIS/OEIS was to (1) notify the public; stakeholders, including federal, state, and local officials and agencies; and federally recognized tribes of the availability of the Draft EIS/OEIS for review and

comment; (2) inform the public, stakeholders, and federally recognized tribes of the Proposed Action, its purpose and need, the alternatives analyzed, and the findings in the draft environmental impact analysis; and (3) provide the opportunity for the public, stakeholders, and federally recognized tribes to comment on the Draft EIS/OEIS. The Navy considered all comments received from the public comment period in the development of the Final EIS/OEIS.

B.3.1 Draft Environmental Impact Statement/Overseas Environmental Impact Statement Public Review and Comment Period Public Notifications

The Navy prepared materials to notify the public of the availability of the Draft EIS/OEIS for review and comment and provide information about the Proposed Action, virtual public meetings, and opportunity for the public to submit comments. Notices were translated into Spanish, and English and Spanish notices were posted to the project website at www.carrierdisposaleis.com. The Navy recognizes the importance of engagement with the public, stakeholders, and federally recognized tribes and took additional steps beyond those required by NEPA to broaden efforts to notify and inform the public. A summary of these efforts follows.

B.3.1.1 Notification Letters

Tribal letters were mailed via U.S. Priority Mail or FedEx on August 18, 2022, to 70 tribal leaders of federally recognized tribes. All tribal letter recipients received a CD-ROM of the Draft EIS/OEIS. Stakeholder letters were sent August 16–18, 2022, to 411 federal, state, and local elected officials; government agencies; and non-federally recognized tribes. A Spanish version of the stakeholder letter was included for local elected officials in Texas. All stakeholder letter recipients received a CD-ROM of the Draft EIS/OEIS.

Entities that received the notification letters can be found in Table B-4, and an example of the tribal letter, and English and Spanish stakeholder letters can be found in Figure B-20, Figure B-21, and Figure B-22.

Table B-4: Entities that Received the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings Notification Letters

Federally Recognized Native American Tribes and Non-Federally Recognized Tribes

Federally Recognized Tribes

- Absentee Tribe of Shawnee
- Alabama-Coushatta Tribe of Texas
- Alabama-Quassarte Tribal Town
- Apache Tribe of Oklahoma
- Caddo Nation of Oklahoma
- Catawba Indian Nation
- Cherokee Nation
- Cheyenne and Arapaho Tribes, Oklahoma
- Chickahominy Indian Tribe
- Chickahominy Indian Tribe Eastern Division
- Chickasaw Nation
- Chitimacha Tribe of Louisiana
- Choctaw Nation
- Comanche Nation of Oklahoma
- Confederated Tribes and Bands of the Yakama Nation
- Confederated Tribes of Grand Ronde
- Confederated Tribes of Siletz Indians
- Confederated Tribes of the Chehalis Reservation
- Confederated Tribes of the Umatilla Indian Reservation
- Confederated Tribes of the Warm Springs Reservation of Oregon
- Coushatta Tribe of Louisiana
- Cowlitz Indian Tribe
- Delaware Nation
- Eastern Band of Cherokee Indians
- Eastern Shawnee Tribe of Oklahoma
- Hoh Indian Tribe
- Jamestown S'Klallam Tribe
- Jena Band of Choctaw Indians
- Kialegee Tribal Town
- Kickapoo Traditional Tribe of Texas
- Kiowa Indian Tribe of Oklahoma
- Lower Elwha Tribal Community
- Lummi Tribe of the Lummi Reservation
- Makah Indian Tribe of the Makah Indian Reservation
- Mescalero Apache Tribe of the Mescalero Reservation, New Mexico
- Mississippi Band of Choctaw Indians
- Monacan Nation
- Muckleshoot Indian Tribe
- Muscogee (Creek) Nation
- Nansemond Indian Nation
- Nez Perce Tribe
- Osage Nation of Oklahoma
- Pamunkey Indian Tribe
- Poarch Band of Creek Indians
- Port Gamble S'Klallam Tribe
- Miccosukee Tribe of Indians Puyallup Tribe of the Puyallup Reservation
- Quapaw Tribe of Oklahoma
- Quileute Tribe of the Quileute Reservation
- Quinault Indian Nation
- Rappahannock Tribe
- Samish Indian Nation
- Seminole Nation of Oklahoma
- Seminole Tribe of Florida
- Shawnee Tribe
- Shoalwater Bay Tribe
- Skokomish Indian Tribe
- Suquamish Indian Tribe of the Port Madison Reservation
- Swinomish Indian Tribal Community
- Thlopthlocco Tribal Town
- Tonkawa Tribe of Indians of Oklahoma
- Tulalip Tribes of Washington
- Tunica-Biloxi Indian Tribe
- Tuscarora Nation
- United Keetoowah Band of Cherokee Indians in Oklahoma
- Upper Mattaponi Tribe
- Upper Skagit Indian Tribe
- Wichita and Affiliated Tribes

Non-Federally Recognized Tribes

- Wanapum Tribe Band of Indians
- Clatsop-Nehalem Confederated Tribes
- Lipan Apache Tribe of Texas
- MOWA Band of Choctaw

Federal Elected Officials and Federal Agencies

U.S. Senators (Alabama, Texas, Virginia, Washington)
U.S. Representatives (Alabama District 1, Texas Districts 15, 34, Virginia Districts 1, 2, 3, Washington Districts 2, 4, 6)

Bureau of Indian Affairs
- Eastern Regional Office
- Northwest Regional Office
- Southern Plains Regional Office

Department of Transportation
- Office of Transportation Policy (P-32)

Environmental Protection Agency
- Office of Federal Activities
- Office of Radiation and Indoor Air
- Region 3
  - Office of Communities, Tribes, and Environmental Assessment
  - Radiation Program
- Region 4
  - Gulf of Mexico Division
  - National Environmental Policy Act Program Office
  - Office of the Regional Administrator
  - Resource Conservation & Resources Division
  - Strategic Programs Office, National Environmental Policy Act Section
- Region 6
  - Air and Radiation Division
  - Office of Communities, Tribes, and Environmental Assessment
- Region 10
  - Air and Radiation Division
  - Office of the Regional Administrator
  - Oregon Operations Office
  - Washington Operations Office

National Oceanic and Atmospheric Administration
- National Marine Fisheries Service
  - Columbia Basin Branch
  - Greater Atlantic Regional Fisheries Office
    - Protected Resources Division
  - Gulf of Mexico Branch
    - Habitat Conservation Division
  - Southeast Regional Office
  - West Coast Regional Office

Nuclear Regulatory Commission
- Division of Decommissioning, Uranium Recovery, and Waste Programs
- Division of Rulemaking, Environmental, and Financial Support
- Region I
- Region II
- Region IV

Olympic Coast National Marine Sanctuary

U.S. Army Corps of Engineers
- Galveston District
- Mobile District
- Norfolk District
- Northwestern Division
- Seattle District
- South Atlantic Division
- Southwestern Division

U.S. Coast Guard
- Atlantic Area
- Office of Operating and Environmental Standards (CG-OES-3)

- Sector Columbia River
- Sector Mobile
- Sector Puget Sound
- Sector/Air Station Corpus Christi

U.S. Department of Agriculture
- Natural Resources Conservation Service

U.S. Fish & Wildlife Service
- Conservation Planning Assistance Branch
- Corpus Christi Field Office
- Gulf Restoration Office
- Northern Gulf Coastal Program
- Pacific Region
- Southeast Region
- Southwest Field Office
- Southwest Region
- Virginia Field Office
- Washington Field Office

State Elected Officials and State Agencies

Office of the Governor (Alabama, Texas, Virginia, Washington)
State Senators (Alabama District 33, Texas District 27, Virginia Districts 1, 2, 5, 6)
Commonwealth of Virginia Delegates (Districts 79, 83, 91, 92, 94, 95)
State Representatives (Alabama District 97, Texas Districts 37, 38)
Washington State Legislature Representatives (Districts 8, 23, 26)
Alabama Department of Agriculture and Industries
Alabama Department of Conservation & Natural Resources
- Marine Resources Division
  - Baldwin County
  - Mobile County
  - Montgomery County
- State Lands Division
  - Coastal Section
- Wildlife & Freshwater Fisheries

Alabama Department of Economic and Community Affairs
- Energy Division

Alabama Department of Environmental Management
- Nonpoint Source Pollution Control Program
- Mobile Coastal Field Office

Alabama Department of Public Health
- Baldwin County Health Department
- Escambia County Health Department
- Mobile County Health Department
- Office of Radiation Control

Alabama Department of Transportation
- Southwest Region

Alabama Emergency Management Agency
Alabama Forestry Commission
- Coastal Program
- Baldwin County
- Mobile County
- Southwest Regional

Alabama Geological Survey
Alabama Historical Commission

Alabama Soil & Water Conservation Committee
Alabama State Port Authority
Oregon Department of Agriculture
    Natural Resources Program Area
Oregon Department of Energy
    Nuclear Safety and Emergency Preparedness
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Oregon Department of Health
    Radiation Protection Services
Oregon Department of State Lands
Oregon Military Department
Oregon Parks & Recreation Department
Oregon Water Resources Department
Pacific States Marine Fisheries Commission
Port of Virginia
South Carolina Department of Health and Environmental Control
    Bureau of Environmental Health Services
Texas Commission on Environmental Quality
    Radioactive Materials Division
    External Relations Division
Texas Department of Agriculture
Texas Department of State Health Services
    Radiation Control Program
    Consumer Protection Division
    Region 11
Texas Department of Transportation
    Pharr District
Texas Division of Emergency Management
Texas Forestry Association
Texas General Land Division
Texas General Land Office
    Coastal Protection Division
Texas Historical Commission
Texas Parks and Wildlife Department
    Coastal Fisheries
    State Parks
Texas State Soil & Water Conservation Board
    District III
The University of Texas
    Bureau of Economic Geology
Virginia Department of Conservation & Recreation, Soil & Water
Virginia Department of Energy
Virginia Department of Environmental Quality
Virginia Department of Forestry
    Eastern Region
Virginia Department of Health
    Community Health Services
    Office and Radiological Health
    Office of Drinking Water
Virginia Department of Historic Resources
Virginia Department of Wildlife Resources
Virginia Marine Resources Commission

Washington Conservation Commission
Washington Department of Agriculture
Washington Department of Archaeology & Historic Preservation
Washington Department of Commerce
Washington Department of Ecology
- Nuclear Waste Program

Washington Department of Fish and Wildlife
- Region 3
- Region 6

Washington Department of Health
- Environmental Health and Safety
- Office of Radiation Protection

Washington Department of Natural Resources
- Aquatic Resources Division
- Forest Resources Division
- Geological Survey
- Public Lands

Washington Department of Transportation
Washington Public Ports Association
Washington State Military Department
- Emergency Management Division

Local Elected Officials and Local Agencies

Baldwin County, Alabama
- County Commissioner, Districts 1, 2, 3, 4
- Highway Department
- Planning & Zoning Department
- Soil & Water Conservation District

Benton County, Washington
- Conservation District
- County Administration
- County Commissioner, Districts 1, 2, 3
- County Health District

Benton Soil and Water Conservation District (Oregon)
Bremerton Metal Trades Council (Washington)
Cameron County, Texas
- County Administrator
- County Commissioner, Precincts 1, 2, 3, 4
- County Community Affairs
- County Emergency Management
- County Judge
- Regional Mobility Authority

City of Bremerton (Washington)
- City Council, Districts 1, 2, 3, 4, 5, 6, 7
- Community Development
- Fire Department
- Mayor
- Parks & Recreation
- Public Works & Utilities

City of Brownsville (Texas)
- Building and Construction
- City Manager
- Commissioners, Districts 1, 2, 3, 4, At-Large "A", At-Large "B"

- Engineering and Public Works
- Fire Department
- Mayor
- Parks & Recreation
- Planning and Redevelopment

City of Daphne (Alabama)
- Building Inspection Department
- Environmental Programs Department

City of Foley (Alabama)
- Wolf Bay Watershed Watch

City of Hampton (Virginia)
- City Manager
- Mayor
- Vice Mayor

City of Gulf Shores (Alabama)
- Environmental

City of Kennewick (Washington)
- Mayor

City of Mobile (Alabama)
- Administrative Services
- Build Mobile
- City Council, Districts 1, 2, 3, 4, 5, 6, 7
- Engineering
- Environmental
- Fire and Rescue Department
- Major Projects
- Mayor
- Parks and Recreation
- Public Works
- Real Estate Asset Management

City of Orange Beach (Alabama)
- Coastal Resources
- Community Development
- Environmental
- Building and Floodplain

City of Newport News (Virginia)
- City Council
  - Central District Seat A, Seat B, North District Seat A, Seat B
- Development
- Division of Emergency Management
- Engineering
- Fire Department
- Mayor
- Parks, Recreation & Tourism
- Planning Commission
- Public Works
- Vice Mayor
- Waterworks
- Zoning

City of Norfolk (Virginia)
- City Manager
- Mayor
- Marketing and Public Relations Manager

City of Pasco (Washington)
- Mayor

City of Port Orchard (Washington)
- Mayor

City of Richland (Washington)
- City Council, Positions 1, 2, 3, 4, 5
- City Manager
- Development Services
- Fire & Emergency Services
- Mayor
- Mayor Pro Tem
- Parks and Public Facilities
- Planning Commission
- Public Works

City of South Padre Island (Texas)
- Planning Department

City of Spanish Fort (Alabama)
- Planning Department

Escambia County, Florida
- Natural Resources
- RESTORE Program

Harlingen Texas Soil and Water Conservation

James City County Board of Supervisors (Virginia)

Kitsap Conservation District (Washington)

Kitsap County, Washington
- Administrative Services
- Commissioners, Districts 1, 2, 3
- Department of Emergency Management
- Public Health District

Mobile Area Water & Sewer Service (Alabama)

Mobile County, Alabama
- County Administrator
- County Attorney
- County Commissioners, Districts 1, 2, 3
- Environmental Services
- Soil & Water Conservation District

Mobile Historic Development Commission (Alabama)

Mobile Historic Preservation Society (Alabama)

Multnomah County, Oregon
- County Chairperson

Port of Benton (Washington)

Port or Bremerton (Washington)

Port of Brownsville (Texas)

South Alabama Regional Planning Commission

York County Board of Supervisors (Virginia)



DEPARTMENT OF THE NAVY
NAVAL BASE KITSAP
120 SOUTH DEWEY STREET
BREMERTON, WA 98314-5020

5090
Ser PRB4/01573
August 4, 2022

The Honorable Leonard Forsman
Chairperson
Suquamish Indian Tribe of the Port Madison Reservation
P.O. Box 498
Suquamish, WA 98392

Dear Chairperson Forsman:

SUBJECT: NOTICE OF AVAILABILITY OF THE DISPOSAL OF DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65) AND ITS ASSOCIATED NAVAL REACTOR PLANTS DRAFT ENVIRONMENTAL IMPACT STATEMENT/ OVERSEAS ENVIRONMENTAL IMPACT STATEMENT AND NOTICE OF VIRTUAL PUBLIC MEETINGS

The Department of the Navy (Navy), with U.S. Department of Energy (DOE) as a cooperating agency, has prepared a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate the potential environmental impacts associated with alternatives for the disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier, including its naval reactor plants. This letter describes the upcoming virtual public meetings, process for submitting comments, and how you can receive additional information. While you are most welcome to attend the virtual public meetings, the Navy also acknowledges our special relationship with Native American Tribes and the responsibility to engage with individual tribal governments to address questions or concerns regarding protected tribal resources, tribal rights, or tribal lands. Based upon our analysis to date, the Navy does not believe the Proposed Action has the potential to significantly impact protected tribal resources, tribal rights, or tribal lands.

USS Enterprise was commissioned in 1961 as the nation's first nuclear-powered aircraft carrier. After more than 50 years of service and one million miles safely steamed on nuclear power, the ship was decommissioned in 2017. USS Enterprise was constructed with eight naval reactor plants housed in rugged compartments inside the ship. As part of the decommissioning process, the nuclear fuel has been removed from the ship's eight reactor plants. Ex-Enterprise is currently being stored pier-side at Newport News Shipbuilding in Newport News, Virginia.

The Proposed Action is to dispose of ex-Enterprise, including its defueled reactor plants. The Proposed Action would entail dismantling and recycling the non-radioactive remnant hull sections of ex-Enterprise at a government or authorized commercial facility in accordance with applicable federal, state, and local laws, and removing and packaging of ex-Enterprise reactor plant components for transportation and disposal as low-level radioactive waste to authorized radioactive waste disposal facilities.

Figure B-20: Tribal Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings

5090
Ser PRB4/01573
August 4, 2022

The purpose of the Proposed Action is to reduce Navy inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and to dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy. Dismantling is the only method approved for the disposition of nuclear-powered ships stricken from the Naval Vessel Register and is required to be accomplished in the United States or its territories in accordance with the statutory responsibilities of the Naval Nuclear Propulsion Program.

The Navy has identified new disposal alternatives that may be more cost-effective and better utilize available resources within Navy public shipyards. Therefore, the Navy prepared this Draft EIS/OEIS and evaluated the following alternatives:

- *Alternative 1 – Single Reactor Compartment Packages*: This alternative involves the partial dismantlement and removal of non-radiological portions of ex-Enterprise at a commercial dismantlement facility. The remainder, including the defueled reactor plants, would be transported by heavy-lift ship to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) for recycling, construction of eight single reactor compartment packages, and shipment by barge to the Port of Benton near the DOE Hanford Site, and via a multiple-wheel, high-capacity transporter to the DOE Hanford Site for disposal.

- *Alternative 2 – Dual Reactor Compartment Packages*: This alternative is the same as Alternative 1, except four dual reactor compartment packages would be constructed rather than eight single reactor compartment packages. The packages would be heavier and larger than reactor compartment packages currently transported to the DOE Hanford Site under the existing Navy program.

- *Alternative 3 – Commercial Dismantlement*: Under this alternative, the Navy would contract with commercial industry to dismantle ex-Enterprise, including its defueled reactor plants, and dispose of the reactor plant components via several hundred shipments to authorized waste disposal sites. The Navy is evaluating three locations for commercial dismantlement: the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; and Mobile, Alabama.

The Navy also evaluated the No Action Alternative, which involves waterborne storage of ex-Enterprise and periodic maintenance to ensure that storage continues in a safe and environmentally responsible manner.

The Navy has identified Alternative 3 – Commercial Dismantlement as its preferred alternative because it will keep the specially qualified and trained PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivation and reactor compartment package work that are already part of the PSNS & IMF workload, will provide cost

Figure B-20: Tribal Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (continued)

5090
Ser PRB4/01573
August 4, 2022

benefits to the U.S. taxpayer, and will not result in significant environmental impacts. The preferred alternative will not result in any decrease in workforce at PSNS & IMF.

The Navy evaluated the potential impacts on environmental resources resulting from activities included in the three action alternatives and the No Action Alternative. Direct, indirect, and cumulative impacts were analyzed. The Navy does not anticipate significant environmental impacts resulting from the proposed alternatives with the implementation of best management practices and mitigation measures.

In compliance with the National Environmental Policy Act (NEPA) of 1969, a public review and comment period for the Draft EIS/OEIS will be held from August 19, 2022 to October 3, 2022. The Navy will hold virtual public meetings to discuss the proposed action, alternatives, and the draft environmental impact analysis. The Navy has assessed that virtual public meetings are the best format to meet statutory requirements under NEPA while mitigating COVID-19 risks. Two virtual public meetings will be held, consisting of a Navy presentation and question-and-answer session. Visit **www.carrierdisposaleis.com/vpm** to learn more about and attend a virtual public meeting. An audio-only option will also be available.

Tuesday, September 20, 2022
4 to 5 p.m., Central Daylight Time

Thursday, September 22, 2022
4 to 5 p.m., Central Daylight Time

Questions that are substantive to the Draft EIS/OEIS for discussion with Navy representatives at the virtual public meetings can be submitted between September 12 and September 21. Substantive questions that are submitted between September 12 and September 19 will be discussed at the September 20 virtual public meeting. Substantive questions that are submitted between September 12 and September 21 will be discussed at the September 22 virtual public meeting. E-mail questions to **info@carrierdisposaleis.com** or complete the form at **www.carrierdisposaleis.com**.

A CD-ROM of the Draft EIS/OEIS is included in this mailing, enclosure (1), and is available on the project website **www.carrierdisposaleis.com** and at these public libraries:

Kitsap Regional Library
Downtown Bremerton Branch
612 Fifth St.
Bremerton, WA 98337

Richland Public Library
955 Northgate Dr.
Richland, WA 99352

Hampton Public Library
4207 Victoria Blvd.
Hampton, VA 23669

Brownsville Public Library
Main Branch
2600 Central Blvd.
Brownsville, TX 78520

Figure B-20: Tribal Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (continued)

5090
Ser PRB4/01574
August 4, 2022

Your input on the Proposed Action, alternatives, and environmental impact analysis are important to the process. Regardless of whether you are able to participate in the virtual public meetings, you may submit comments, additional information, and any updated contact information to:

Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

You may also submit comments online at the Navy EIS/OEIS project website at **www.carrierdisposaleis.com**. All comments must be postmarked or received online by the end of the day on October 3, 2022, for consideration in the Final EIS/OEIS. All comments submitted during the comment period will become part of the public record and comments that are substantive to the analysis will be addressed in the Final EIS/OEIS.

The Draft EIS/OEIS will be available at the above Navy website as well as the DOE Hanford NEPA website at **www.energy.gov/NEPA**. Additional supporting NEPA documents are also available on the Navy website.

I look forward to working with you to provide additional information you may need and address your concerns. Feel free to contact Ms. Danielle Page-Pattison at [redacted] or via e-mail at [redacted] with any questions or comments.

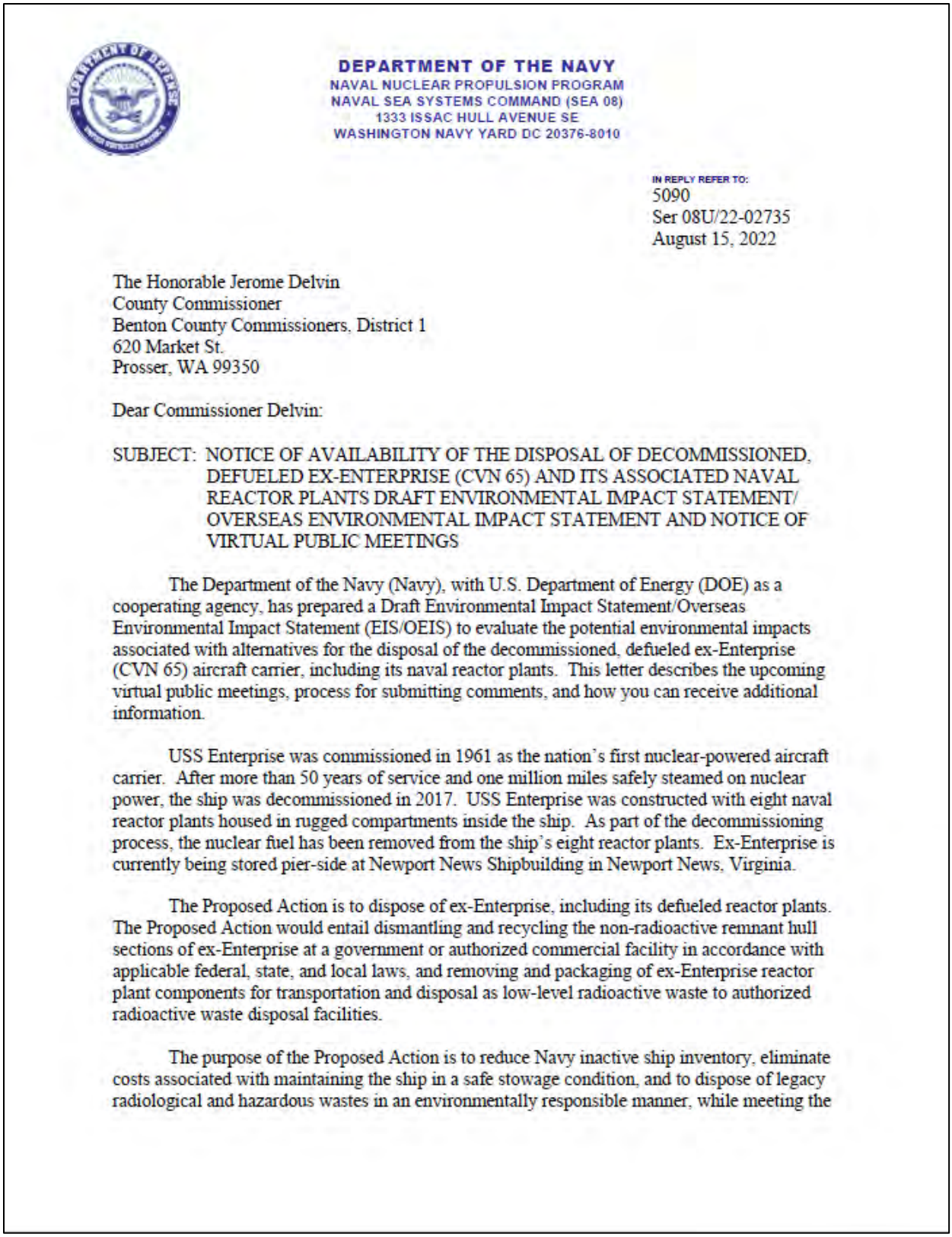
Sincerely,

R/N. MASSIE
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants Draft EIS/OEIS (CD-ROM)

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Figure B-20: Tribal Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (continued)



DEPARTMENT OF THE NAVY
NAVAL NUCLEAR PROPULSION PROGRAM
NAVAL SEA SYSTEMS COMMAND (SEA 08)
1333 ISSAC HULL AVENUE SE
WASHINGTON NAVY YARD DC 20376-8010

IN REPLY REFER TO:
5090
Ser 08U/22-02735
August 15, 2022

The Honorable Jerome Delvin
County Commissioner
Benton County Commissioners, District 1
620 Market St.
Prosser, WA 99350

Dear Commissioner Delvin:

SUBJECT: NOTICE OF AVAILABILITY OF THE DISPOSAL OF DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65) AND ITS ASSOCIATED NAVAL REACTOR PLANTS DRAFT ENVIRONMENTAL IMPACT STATEMENT/ OVERSEAS ENVIRONMENTAL IMPACT STATEMENT AND NOTICE OF VIRTUAL PUBLIC MEETINGS

The Department of the Navy (Navy), with U.S. Department of Energy (DOE) as a cooperating agency, has prepared a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate the potential environmental impacts associated with alternatives for the disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier, including its naval reactor plants. This letter describes the upcoming virtual public meetings, process for submitting comments, and how you can receive additional information.

USS Enterprise was commissioned in 1961 as the nation's first nuclear-powered aircraft carrier. After more than 50 years of service and one million miles safely steamed on nuclear power, the ship was decommissioned in 2017. USS Enterprise was constructed with eight naval reactor plants housed in rugged compartments inside the ship. As part of the decommissioning process, the nuclear fuel has been removed from the ship's eight reactor plants. Ex-Enterprise is currently being stored pier-side at Newport News Shipbuilding in Newport News, Virginia.

The Proposed Action is to dispose of ex-Enterprise, including its defueled reactor plants. The Proposed Action would entail dismantling and recycling the non-radioactive remnant hull sections of ex-Enterprise at a government or authorized commercial facility in accordance with applicable federal, state, and local laws, and removing and packaging of ex-Enterprise reactor plant components for transportation and disposal as low-level radioactive waste to authorized radioactive waste disposal facilities.

The purpose of the Proposed Action is to reduce Navy inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and to dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the

Figure B-21: Stakeholder Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English)

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operational needs of the Navy. Dismantling is the only method approved for the disposition of nuclear-powered ships stricken from the Naval Vessel Register and is required to be accomplished in the United States or its territories in accordance with the statutory responsibilities of the Naval Nuclear Propulsion Program.

The Navy has identified new disposal alternatives that may be more cost-effective and better utilize available resources within Navy public shipyards. Therefore, the Navy prepared this Draft EIS/OEIS and evaluated the following alternatives:

- *Alternative 1 – Single Reactor Compartment Packages*: This alternative involves the partial dismantlement and removal of non-radiological portions of ex-Enterprise at a commercial dismantlement facility. The remainder, including the defueled reactor plants, would be transported by heavy-lift ship to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) for recycling, construction of eight single reactor compartment packages, and shipment by barge to the Port of Benton near the DOE Hanford Site, and via a multiple-wheel, high-capacity transporter to the DOE Hanford Site for disposal.

- *Alternative 2 – Dual Reactor Compartment Packages*: This alternative is the same as Alternative 1, except four dual reactor compartment packages would be constructed rather than eight single reactor compartment packages. The packages would be heavier and larger than reactor compartment packages currently transported to the DOE Hanford Site under the existing Navy program.

- *Alternative 3 – Commercial Dismantlement*: Under this alternative, the Navy would contract with commercial industry to dismantle ex-Enterprise, including its defueled reactor plants, and dispose of the reactor plant components via several hundred shipments to authorized waste disposal sites. The Navy is evaluating three locations for commercial dismantlement: the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; and Mobile, Alabama.

The Navy also evaluated the No Action Alternative, which involves waterborne storage of ex-Enterprise and periodic maintenance to ensure that storage continues in a safe and environmentally responsible manner.

The Navy has identified Alternative 3 – Commercial Dismantlement as its preferred alternative because it will keep the specially qualified and trained PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivation and reactor compartment package work that are already part of the PSNS & IMF workload, will provide cost benefits to the U.S. taxpayer, and will not result in significant environmental impacts. The preferred alternative will not result in any decrease in workforce at PSNS & IMF.

The Navy evaluated the potential impacts on environmental resources resulting from activities included in the three action alternatives and the No Action Alternative. Direct, indirect, and cumulative impacts were analyzed. The Navy does not anticipate significant

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Figure B-21: Stakeholder Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English) (continued)

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Ser 08U/22-02735
August 15, 2022

environmental impacts resulting from the proposed alternatives with the implementation of best management practices and mitigation measures.

In compliance with the National Environmental Policy Act (NEPA) of 1969, a public review and comment period for the Draft EIS/OEIS will be held from August 19, 2022, to October 3, 2022. The Navy will hold virtual public meetings to discuss the Proposed Action, alternatives, and the draft environmental impact analysis. The Navy has assessed that virtual public meetings are the best format to meet statutory requirements under NEPA while mitigating COVID-19 risks. Two virtual public meetings will be held, consisting of a Navy presentation and question-and-answer session. Visit **www.carrierdisposaleis.com/vpm** to learn more about and attend a virtual public meeting. An audio-only option will also be available.

Tuesday, September 20, 2022
4 to 5 p.m. Central Daylight Time

Thursday, September 22, 2022
4 to 5 p.m. Central Daylight Time

Questions that are substantive to the Draft EIS/OEIS for discussion with Navy representatives at the virtual public meetings can be submitted between September 12 and September 21. Substantive questions that are submitted between September 12 and September 19 will be discussed at the September 20 virtual public meeting. Substantive questions that are submitted between September 12 and September 21 will be discussed at the September 22 virtual public meeting. Email questions to **info@carrierdisposaleis.com** or complete the form at **www.carrierdisposaleis.com**.

A CD-ROM of the Draft EIS/OEIS is included in this mailing (Enclosure 1) and is available on the project website **www.carrierdisposaleis.com** and at these public libraries:

Kitsap Regional Library
Downtown Bremerton Branch
612 Fifth St.
Bremerton, WA 98337

Richland Public Library
955 Northgate Dr.
Richland, WA 99352

Hampton Public Library
4207 Victoria Blvd.
Hampton, VA 23669

Brownsville Public Library
Main Branch
2600 Central Blvd.
Brownsville, TX 78520

Brownsville Public Library
Southmost Branch
4320 Southmost Blvd.
Brownsville, TX 78521

Ben May Main Library
701 Government St.
Mobile, AL 36602

Your input on the Proposed Action, alternatives, and environmental impact analysis are important to the process. Regardless of whether you are able to participate in the virtual public

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Figure B-21: Stakeholder Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English) (continued)

5090
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meetings, you may submit comments, additional information, and any updated contact information to:

Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

You may also submit comments online at the Navy EIS/OEIS project website **www.carrierdisposaleis.com**. All comments must be postmarked or received online by the end of the day on October 3, 2022, for consideration in the Final EIS/OEIS. All comments submitted during the comment period will become part of the public record, and comments that are substantive to the analysis will be addressed in the Final EIS/OEIS.

The Draft EIS/OEIS will be available at the above Navy website as well as the DOE Hanford NEPA website at **www.energy.gov/NEPA**. Additional supporting NEPA documents are also available on the Navy website.

I look forward to working with you to provide additional information you may need and address your concerns. Feel free to contact Public Affairs Officer, Office of Congressional and Public Affairs, PSNS & IMF, at 360-476-7111 with any questions or comments.

Sincerely,

J. M. AVERY
Director, Regulatory and Security Affairs
Naval Nuclear Propulsion Program/
Naval Reactors

Enclosure 1: Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants Draft EIS/OEIS (CD-ROM)

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Figure B-21: Stakeholder Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English) (continued)



DEPARTAMENTO DE LA ARMADA
PROGRAMA DE PROPULSIÓN NUCLEAR DE LA ARMADA
NAVAL SEA SYSTEMS COMMAND (SEA 08)
1333 ISSAC HULL AVENUE SE
WASHINGTON NAVY YARD DC 20376-8010

15 de agosto de 2022

Estimado/a:

ASUNTO: AVISO DE DISPONIBILIDAD DEL BORRADOR DE LA DECLARACIÓN DE IMPACTO AMBIENTAL/DECLARACIÓN DE IMPACTO AMBIENTAL EN EL EXTRANJERO PARA LA ELIMINACIÓN DEL PORTAAVIONES EX-ENTERPRISE DECOMISIONADO Y SIN COMBUSTIBLE NUCLEAR (CVN 65) Y SUS PLANTAS DE REACTORES NAVALES ASOCIADAS Y AVISO DE REUNIONES PÚBLICAS VIRTUALES

El Departamento de la Armada (Armada), con el Departamento de Energía de los Estados Unidos (DOE, por sus siglas en inglés) como agencia colaboradora, ha preparado un Borrador de la Declaración de Impacto Ambiental/Declaración de Impacto Ambiental en el Extranjero (EIS/OEIS, por sus siglas en inglés) para evaluar los posibles impactos ambientales asociados a las alternativas para la eliminación del portaaviones ex-Enterprise (CVN 65) decomisionado y sin combustible nuclear, incluyendo sus plantas de reactores navales. Esta carta describe las próximas reuniones públicas virtuales, el proceso para presentar comentarios y cómo puede recibir información adicional.

El USS Enterprise fue comisionado en 1961 como el primer portaaviones de propulsión nuclear del país. Después de más de 50 años de servicio y un millón de millas impulsadas de manera segura con energía nuclear, el barco fue decomisionado en 2017. El USS Enterprise se construyó con ocho plantas de reactores navales ubicadas en compartimentos resistentes dentro del barco. Como parte del proceso de decomisionamiento, el combustible nuclear ha sido retirado de las ocho plantas de reactores del barco. Actualmente, el ex-Enterprise está almacenado en el muelle del Newport News Shipbuilding en Newport News, Virginia.

La acción propuesta consiste en eliminar el ex-Enterprise, incluidas sus plantas de reactores sin combustible nuclear. La acción propuesta implicaría el desmantelamiento y el reciclaje de las secciones del casco no radiactivo del ex-Enterprise en una instalación gubernamental o comercial autorizada de acuerdo con las leyes federales, estatales y locales aplicables, y la retirada y el empaque de los componentes de la planta del reactor del ex-Enterprise para su transporte y eliminación como residuos radiactivos de baja actividad en instalaciones de eliminación de residuos radiactivos autorizadas.

El objetivo de la acción propuesta es reducir el inventario de barcos inactivos de la Armada, eliminar los costos asociados al mantenimiento del barco en condiciones seguras de estiba y eliminar los residuos radiológicos y peligrosos heredados de una manera ambientalmente responsable, al tiempo que se satisfacen las necesidades operativas de la Armada. El desmantelamiento es el único método aprobado para la eliminación de los barcos de propulsión nuclear dados de baja en el Registro de Buques de la Armada y debe llevarse a cabo en los Estados Unidos o sus territorios de acuerdo con las responsabilidades estatutarias del Programa de Propulsión Nuclear de la Armada.

Figure B-22: Stakeholder Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish)

La Armada ha identificado nuevas alternativas de eliminación que pueden ser más rentables y utilizar mejor los recursos disponibles en los astilleros públicos de la Armada. Por lo tanto, la Armada preparó este Borrador de Declaración de EIS/OEIS y evaluó las siguientes alternativas:

- *Alternativa 1 – Paquetes individuales de compartimientos de reactores*: esta alternativa implica el desmantelamiento parcial y la retirada de las partes no radiológicas del ex-Enterprise en una planta comercial de desmantelamiento. El resto, incluyendo las plantas de reactores sin combustible nuclear, se transportarían en un barco de carga pesada al Astillero Naval de Puget Sound y a las Instalaciones de Mantenimiento Intermedio (PSNS e IMF, por sus siglas en inglés) para su reciclaje, la construcción de ocho paquetes de compartimentos de reactores individuales y el envío por barcaza al puerto de Benton, cerca del Hanford Site del DOE, y a través de un transportador de ruedas múltiples y gran capacidad al Hanford Site del DOE.

- *Alternativa 2 – Paquetes de compartimentos de doble reactor*: esta alternativa es la misma que la Alternativa 1, excepto que se construirían cuatro paquetes de compartimentos de reactores duales en lugar de ocho paquetes individuales de compartimientos de reactores. Los paquetes serían más pesados y más grandes que los paquetes de los compartimentos de los reactores que se transportan actualmente al Hanford Site del DOE en el marco del programa existente de la Armada.

- *Alternativa 3 – Desmantelamiento comercial*: según esta alternativa, la Armada contrataría a la industria comercial para desmantelar el ex-Enterprise, incluidas sus plantas de reactores sin combustible nuclear, y eliminaría los componentes de las plantas de reactores mediante varios cientos de envíos a lugares autorizados para la eliminación de residuos. La Armada está evaluando tres ubicaciones para el desmantelamiento comercial: el área metropolitana de Hampton Roads, Virginia; Brownsville, Texas; y Mobile, Alabama.

La Armada también evaluó la alternativa de No Acción, que implica el almacenamiento en el agua del ex-Enterprise y el mantenimiento periódico para garantizar que el almacenamiento continúe de manera segura y ambientalmente responsable.

La Armada ha identificado la Alternativa 3, el desmantelamiento comercial, como su alternativa preferida porque mantendrá la mano de obra especialmente cualificada y capacitada de PSNS e IMF enfocada en los trabajos de mantenimiento de la flota de alta prioridad y en los trabajos de inactivación de submarinos y de paquetes de compartimentos de reactores que ya forman parte de la carga de trabajo de PSNS e IMF, proporcionará beneficios de costos al contribuyente estadounidense y no tendrá impactos ambientales significativos. La alternativa preferida no supondrá ninguna disminución de la fuerza de trabajo en PSNS e IMF.

La Armada evaluó los impactos potenciales sobre los recursos ambientales resultantes de las actividades incluidas en las tres alternativas de acción y la alternativa de No Acción. Se analizaron los impactos directos, indirectos y acumulativos. La Armada no prevé impactos

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Figure B-22: Stakeholder Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish) (continued)

ambientales significativos como resultado de las alternativas propuestas con la aplicación de las mejores prácticas de gestión y las medidas de mitigación.

En cumplimiento de la Ley de Política Nacional del Medioambiente (NEPA, por sus siglas en inglés) de 1969, se abrirá un período de revisión y comentarios públicos para el Borrador de la EIS/OEIS desde el 19 de agosto de 2022 hasta el 3 de octubre de 2022. La Armada celebrará reuniones públicas virtuales para discutir la Acción Propuesta, las alternativas y el borrador del análisis de impacto ambiental. La Armada ha evaluado que las reuniones públicas virtuales son el mejor formato para cumplir los requisitos legales de la NEPA a la vez que se mitigan los riesgos del COVID-19. Se celebrarán dos reuniones públicas virtuales, que consistirán en una presentación de la Armada y una sesión de preguntas y respuestas. Visite **www.carrierdisposaleis.com/vpm** para obtener más información y asistir a una reunión pública virtual. También habrá una opción de solo audio.

Martes 20 de septiembre de 2022
4 a 5 p.m., horario central de verano

Jueves 22 de septiembre de 2022
4 a 5 p.m., horario central de verano

Entre el 12 y el 21 de septiembre se pueden presentar preguntas sustanciales sobre el Borrador de la EIS/OEIS para debatirlas con los representantes de la Armada en las reuniones públicas virtuales. Las preguntas sustanciales que se presenten entre el 12 y el 19 de septiembre se tratarán en la reunión pública virtual del 20 de septiembre. Las preguntas sustanciales que se presenten entre el 12 y el 21 de septiembre se tratarán en la reunión pública virtual del 22 de septiembre. Envíe por correo electrónico las preguntas a **info@carrierdisposaleis.com** o complete el formulario en **www.carrierdisposaleis.com**.

En este envío se incluye un CD-ROM del Borrador de la EIS/OEIS (Anexo 1) y está disponible en el sitio web del proyecto **www.carrierdisposaleis.com** y en estas bibliotecas públicas:

Kitsap Regional Library
Downtown Bremerton Branch
612 Fifth St.
Bremerton, WA 98337

Richland Public Library
955 Northgate Dr.
Richland, WA 99352

Hampton Public Library
4207 Victoria Blvd.
Hampton, VA 23669

Brownsville Public Library
Main Branch
2600 Central Blvd.
Brownsville, TX 78520

Brownsville Public Library
Southmost Branch
4320 Southmost Blvd.
Brownsville, TX 78521

Ben May Main Library
701 Government St.
Mobile, AL 36602

3

Figure B-22: Stakeholder Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish) (continued)

Sus aportaciones sobre la acción propuesta, las alternativas y el análisis de impacto ambiental son importantes para el proceso. Independientemente de que pueda participar en las reuniones públicas virtuales o no, usted puede enviar sus comentarios, información adicional y cualquier información de contacto actualizada a:

Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

También puede presentar sus comentarios en línea en el sitio web del proyecto de la EIS/OEIS de la Armada en **www.carrierdisposaleis.com**. Todos los comentarios deben contar con el matasellos del correo postal o ser recibidos en línea antes de que termine el día 3 de octubre de 2022, para que sean considerados en la EIS/OEIS Final. Todos los comentarios presentados durante el período de comentarios pasarán a formar parte del registro público, y los comentarios que sean sustanciales para el análisis se abordarán en la EIS/OEIS Final.

El Borrador de la EIS/OEIS estará disponible en el sitio web de la Armada mencionado anteriormente, así como en el sitio web de la NEPA de Hanford del DOE en **www.energy.gov/NEPA**. También puede encontrar documentos de apoyo adicionales relacionados con la NEPA en el sitio web de la Armada.

Espero trabajar con usted para proporcionarle información adicional que pudiera necesitar y abordar sus inquietudes. Si tiene preguntas o comentarios, no dude en comunicarse con el Oficial de Asuntos Públicos, Oficina de Asuntos Públicos y del Congreso, PSNS e IMF llamando al número 360-476-7111.

Atentamente,

J. M. AVERY
Director de la División de Asuntos Regulatorios
Programa de Propulsión Nuclear Naval/
Reactores Navales

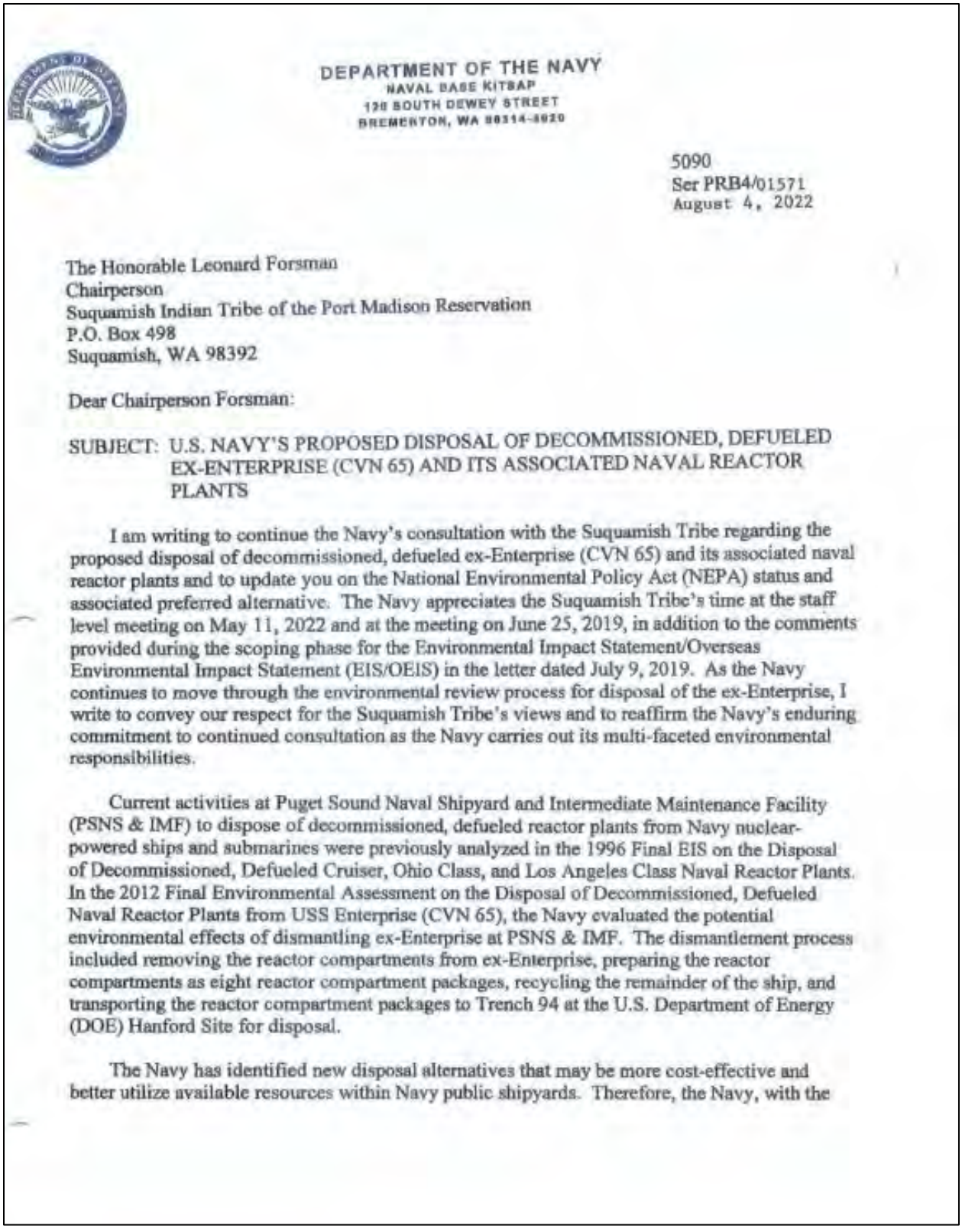
Anexo 1: Borrador de la EIS/OEIS (CR-ROM) de la eliminación del Ex-Enterprise decomisionado y sin combustible nuclear (CVN 65) y sus plantas de reactores navales asociadas

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Figure B-22: Stakeholder Notification Letter for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish) (continued)

B.3.1.2 Letter to the Suquamish Indian Tribe of the Port Madison Reservation

The Navy sent a tailored letter via FedEx to the Chairperson of the Suquamish Indian Tribe of the Port Madison Reservation on August 17, 2022, due to the Navy's long-term relationship with the Tribe and the Tribe's interest and participation in the project's environmental review process. The letter can be found in Figure B-23.



DEPARTMENT OF THE NAVY
NAVAL BASE KITSAP
120 SOUTH DEWEY STREET
BREMERTON, WA 98314-5020

5090
Ser PRB4/01571
August 4, 2022

The Honorable Leonard Forsman
Chairperson
Suquamish Indian Tribe of the Port Madison Reservation
P.O. Box 498
Suquamish, WA 98392

Dear Chairperson Forsman:

SUBJECT: U.S. NAVY'S PROPOSED DISPOSAL OF DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65) AND ITS ASSOCIATED NAVAL REACTOR PLANTS

I am writing to continue the Navy's consultation with the Suquamish Tribe regarding the proposed disposal of decommissioned, defueled ex-Enterprise (CVN 65) and its associated naval reactor plants and to update you on the National Environmental Policy Act (NEPA) status and associated preferred alternative. The Navy appreciates the Suquamish Tribe's time at the staff level meeting on May 11, 2022 and at the meeting on June 25, 2019, in addition to the comments provided during the scoping phase for the Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) in the letter dated July 9, 2019. As the Navy continues to move through the environmental review process for disposal of the ex-Enterprise, I write to convey our respect for the Suquamish Tribe's views and to reaffirm the Navy's enduring commitment to continued consultation as the Navy carries out its multi-faceted environmental responsibilities.

Current activities at Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) to dispose of decommissioned, defueled reactor plants from Navy nuclear-powered ships and submarines were previously analyzed in the 1996 Final EIS on the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants. In the 2012 Final Environmental Assessment on the Disposal of Decommissioned, Defueled Naval Reactor Plants from USS Enterprise (CVN 65), the Navy evaluated the potential environmental effects of dismantling ex-Enterprise at PSNS & IMF. The dismantlement process included removing the reactor compartments from ex-Enterprise, preparing the reactor compartments as eight reactor compartment packages, recycling the remainder of the ship, and transporting the reactor compartment packages to Trench 94 at the U.S. Department of Energy (DOE) Hanford Site for disposal.

The Navy has identified new disposal alternatives that may be more cost-effective and better utilize available resources within Navy public shipyards. Therefore, the Navy, with the

Figure B-23: Letter to the Suquamish Indian Tribe of the Port Madison Reservation

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DOE as a cooperating agency, prepared the Draft EIS/OEIS and evaluated the following alternatives:

- *Alternative 1 – Single Reactor Compartment Packages*: This alternative involves the partial dismantlement and removal of non-radiological portions of ex-Enterprise at a commercial dismantlement facility. The remainder, including the reactor plants, would be transported by heavy-lift ship to PSNS & IMF for recycling and construction of eight single reactor compartment packages and shipment by barge to the Port of Benton near the DOE Hanford Site, and via a multiple-wheel high-capacity transporter to the DOE Hanford Site for disposal.

- *Alternative 2 – Dual Reactor Compartment Packages*: This alternative is the same as Alternative 1, except four dual reactor compartment packages would be constructed rather than eight single reactor compartment packages. The packages would be heavier and larger than reactor compartment packages currently transported to the DOE Hanford Site under the existing Navy program.

- *Alternative 3 – Commercial Dismantlement*: Under this alternative, the Navy would contract with commercial industry to dismantle ex-Enterprise, including its reactor plants, and dispose of the reactor plant components via several hundred shipments to authorized waste disposal sites. The Navy is evaluating three locations for commercial dismantlement: the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; and Mobile, Alabama.

The Navy also evaluated the No Action Alternative, which involves waterborne storage of ex-Enterprise and periodic maintenance to ensure that storage continues in a safe and environmentally responsible manner.

The Navy has identified **Alternative 3 - Commercial Dismantlement as its preferred alternative** because it will keep the specially qualified and trained PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivation and reactor compartment package work that are already part of the PSNS & IMF workload, will provide cost benefits to the U.S. taxpayer, and will not result in significant environmental impacts. The preferred alternative will not result in any decrease in workforce at PSNS & IMF.

The Navy evaluated the potential impacts on environmental resources resulting from activities included in the three action alternatives and the No Action Alternative. Direct, indirect, and cumulative impacts were analyzed. The Navy does not anticipate significant environmental impacts resulting from the proposed alternatives with the implementation of best management practices and mitigation measures. Based on the Navy's analysis to date, the Navy does not

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Figure B-23: Letter to the Suquamish Indian Tribe of the Port Madison Reservation (continued)

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believe the Proposed Action has the potential to significantly impact protected tribal resources, tribal rights, or tribal lands.

The Suquamish Tribe's scoping comments contained in the letter dated July 9, 2019 included a request for the Navy to consider potential impacts associated with: the compartment package disposal process; in-water preparations; transportation of the ex-Enterprise reactor compartment packages to and from PSNS & IMF; Tribal fishing and fishery resources; Southern Resident killer whales and other Endangered Species Act (ESA)-listed species. The Draft EIS/OEIS includes analysis of the potential impacts on these subjects within the applicable alternatives and a brief summary is provided in this letter as follows.

Chapter 3.3 (American Indian Tribal Resources and Treaty Rights) of the Draft EIS/OEIS analyzes potential impacts on American Indian tribal resources and treaty rights including potential impacts on access of usual and accustomed (U&A) fishing and shellfish collecting grounds; and culturally significant vegetation and wildlife. The Navy determined that some activities in Alternatives 1 and 2 would have the potential for minimal impacts on tribal resources and treaty rights. Under the Preferred Alternative (Alternative 3), no activities for the Proposed Action would occur within the Suquamish Tribe's U&A areas. Accordingly, the Navy believes no impacts would occur to the Suquamish Tribe's tribal resources or treaty rights under the Preferred Alternative (Alternative 3).

Under Alternative 1 and 2, transit of the propulsion space section to PSNS & IMF would occur within established shipping lanes and in compliance with all applicable regulations, and would not impede access to U&A fishing grounds. Although unlikely, loss of or damage to tribal fishing gear could result from transit of the propulsion space section via heavy-lift ship along the Washington coast and Puget Sound. However, tribal fishermen mark their gear in accordance with fishing regulations, and the Navy uses standard navigational practices to avoid potential interactions with fixed gear. As described in Section 3.5 (Biological Resources) of the Draft EIS/OEIS, heavy-lift ship transport of the propulsion space section to PSNS & IMF would have negligible impacts on biological resources and would not likely adversely affect ESA-listed species along the heavy-lift ship route.

Work performed at PSNS & IMF under Alternative 1 and 2 would follow typical past and ongoing shipyard work practices and would be in accordance with all agreements, permits, and regulations. No in-water work would be conducted at PSNS & IMF and construction of reactor compartment packages would occur within a dry dock. The work at PSNS & IMF are routine activities with established standard operating procedures and best management practices. Section 3.1 (Public Health and Safety) of the Draft EIS/OEIS includes detailed descriptions of policies and procedures to ensure safe removal of liquids and equipment. These activities are considered normal pier-side and dry dock actions, with similar activities analyzed previously in

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Figure B-23: Letter to the Suquamish Indian Tribe of the Port Madison Reservation (continued)

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the 1996 EIS, resulting in less than significant impacts on biological resources with no effect on ESA-listed species.

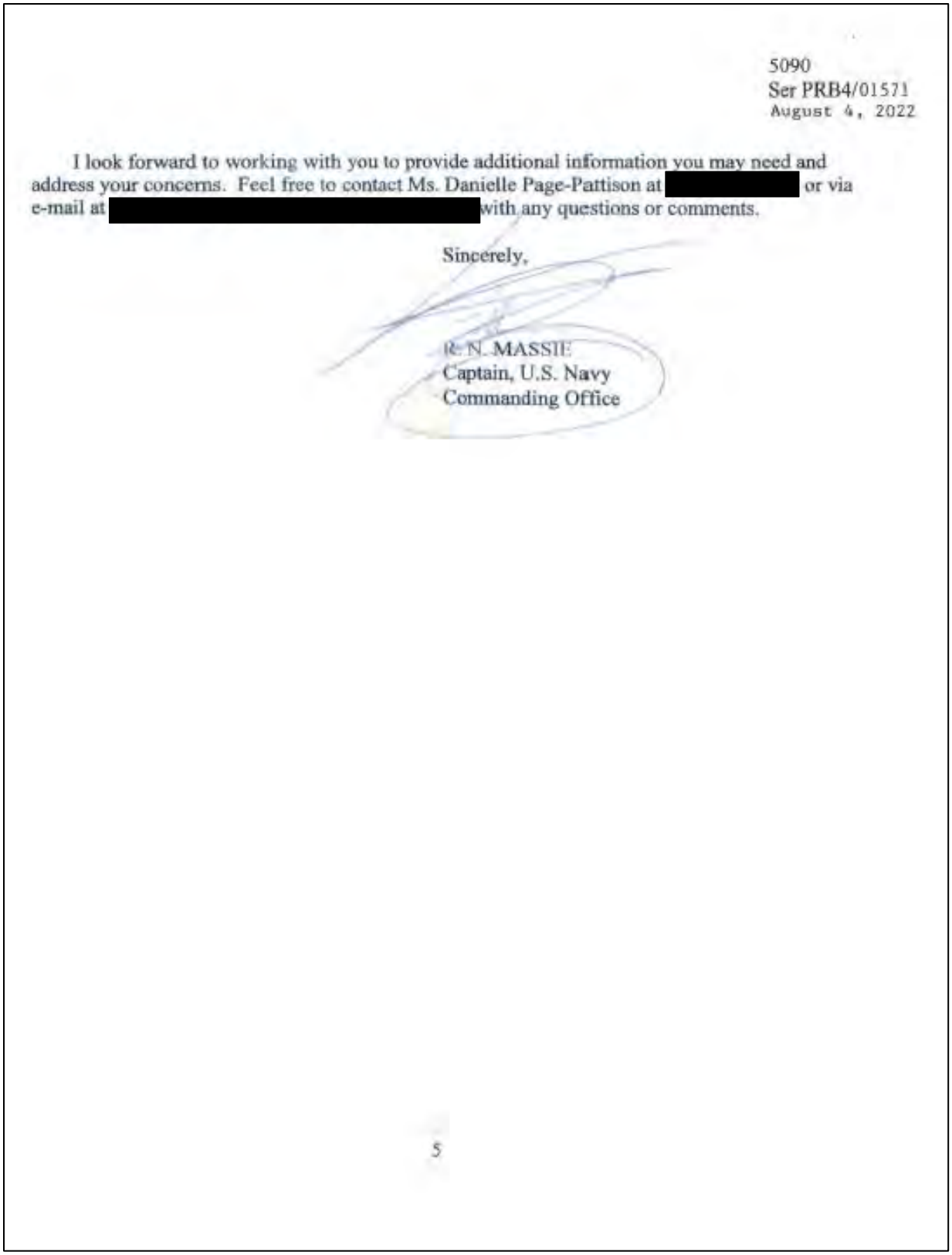
Transport of ex-Enterprise reactor compartment packages from PSNS & IMF to the Port of Benton barge slip for Alternative 1 and 2, would occur in established shipping lanes along the same route currently used for various submarine and cruiser packages and be conducted in compliance with applicable regulations. The number of reactor compartment shipments per year from PSNS & IMF would be consistent with the current number of annual reactor compartment package shipments. The current water transport route was previously analyzed in the 1996 EIS and the Navy determined that barge transport would have no significant impacts on biological resources and no effect on ESA-listed species that may occur along the barge transport route.

In summary, as documented in the Draft EIS/OEIS (anticipated to be published in the Federal Register on August 19, 2022), pursuant to the NEPA, the Navy evaluated the potential impacts on environmental resources resulting from activities included in the three action alternatives and the No Action Alternative. The Navy does not anticipate significant environmental impacts resulting from the proposed alternatives with the implementation of best management practices and mitigation measures. The complete commercial dismantlement alternative (Alternative 3) is the Navy's Preferred Alternative. The Proposed Action would not occur within the Suquamish Tribe's U&A areas under the Preferred Alternative.

In closing, on behalf of the Navy team, I convey our commitment to continue strengthening a long-term, government-to-government relationship founded on mutual trust and respect for the sovereignty of the Suquamish Tribe. Your input on the Proposed Action, alternatives, and environmental impact analysis are important to the process. The Tribe will also soon be receiving a letter for the Notice of Availability of the Disposal of Decommissioned, Defueled ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants Draft EIS/OEIS and Notice of Public Meetings, which includes further details on the public comment period, public meetings and contains a CD-ROM of the Draft EIS/OEIS. The Navy welcomes the Suquamish Tribe to further participate in the public comment period on the Draft EIS/OEIS (anticipated through October 3, 2022).

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Figure B-23: Letter to the Suquamish Indian Tribe of the Port Madison Reservation (continued)



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August 4, 2022

I look forward to working with you to provide additional information you may need and address your concerns. Feel free to contact Ms. Danielle Page-Pattison at [redacted] or via e-mail at [redacted] with any questions or comments.

Sincerely,

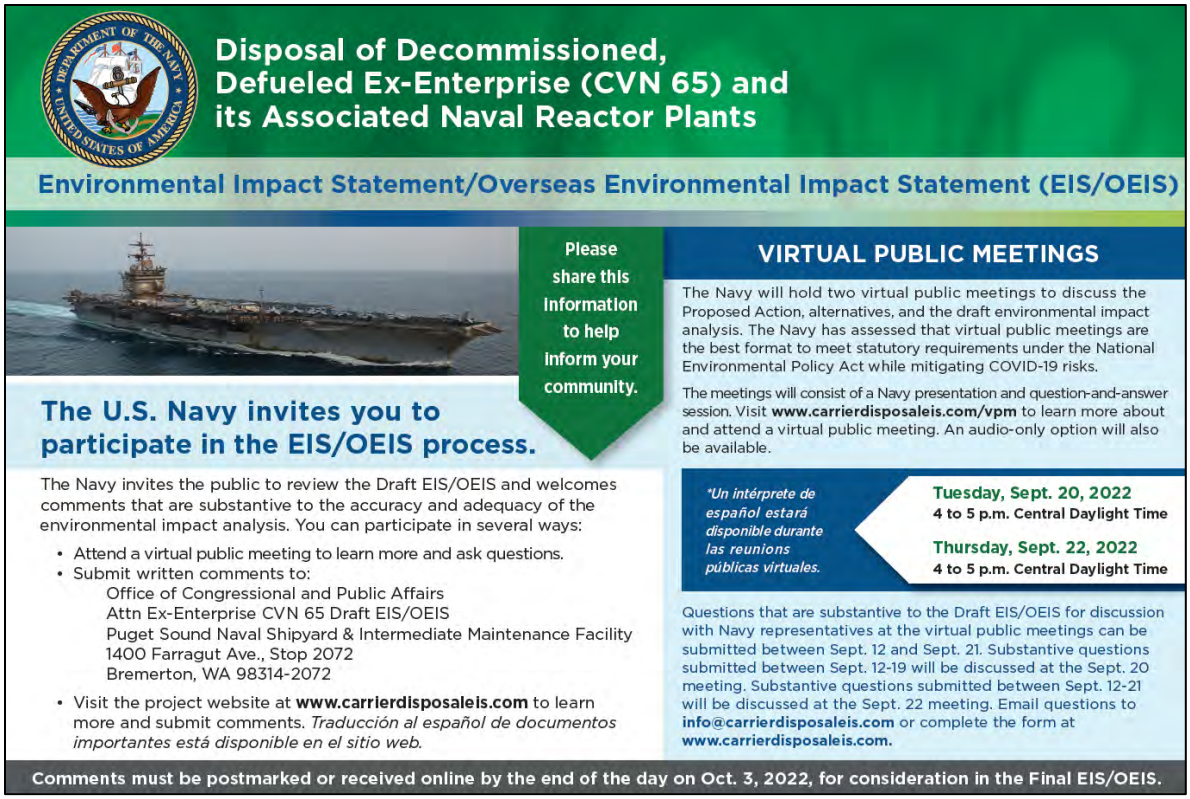
R. N. MASSIE
Captain, U.S. Navy
Commanding Office

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Figure B-23: Letter to the Suquamish Indian Tribe of the Port Madison Reservation (continued)

B.3.1.3 Postcard Mailers

Postcards were mailed first-class August 18, 2022, to 670 individuals, community and business groups, tribal staff, nongovernmental organizations, and media outlets. The English-language postcard included statements in Spanish that a Spanish interpreter would be present at the virtual public meetings and that project information in Spanish is available on the project website. The English and Spanish versions of the postcard mailers were made available on the project website and are shown in Figure B-24 and Figure B-25.



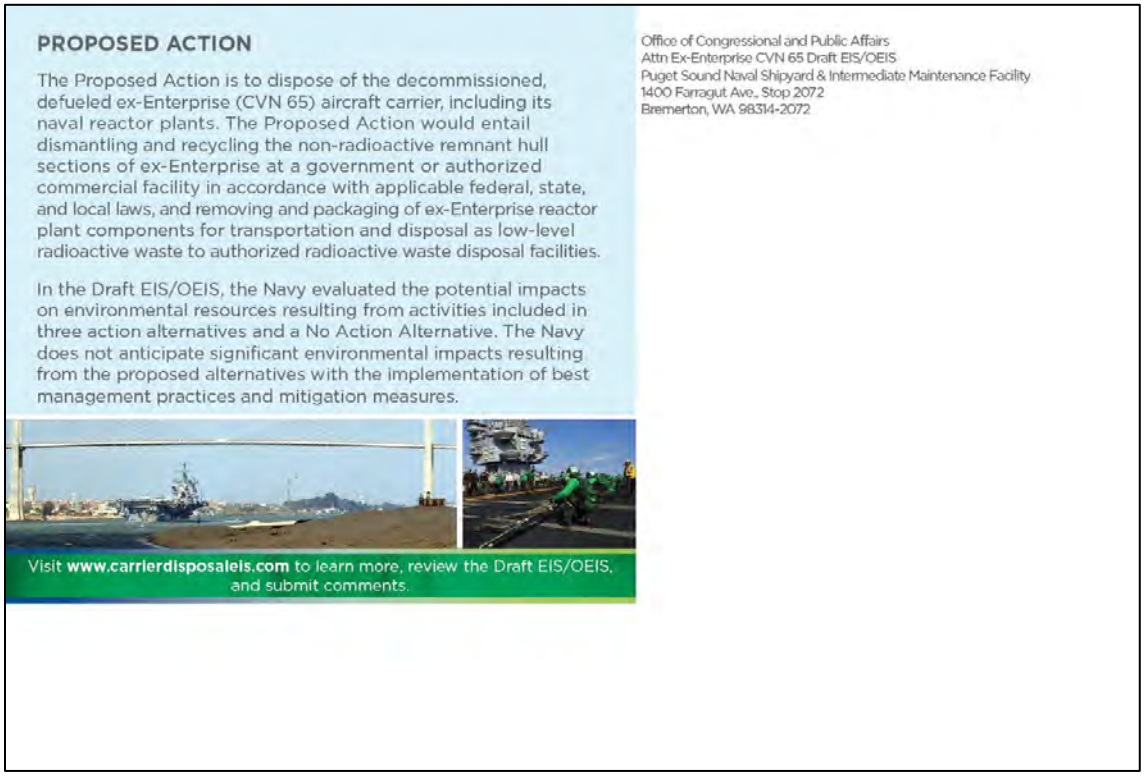


Figure B-24: Postcard Mailer for the Draft EIS Notice of Availability and Notice of Virtual Public Meetings (English) (Front and Back)





Figure B-25: Postcard Mailer for the Draft EIS Notice of Availability and Notice of Virtual Public Meetings (Spanish) (Front and Back)

B.3.1.4 Newspaper Advertisements

The Navy published display advertisements in a total of 13 local and regional newspapers, including five Spanish-language publications, to announce the notice of availability of the Draft EIS/OEIS, the virtual public meetings, and the public review and comment period. The advertisements included a brief description of the Draft EIS/OEIS; the virtual public meeting dates and times, including when and how to submit a question; the project website address; the duration of the comment period; and information on how to provide comments. A Spanish version of the advertisement was published in the Spanish-language newspapers. In addition to printed advertisements, online advertisements were also placed during the Draft EIS/OEIS public review and comment phase in the online editions of each of the newspapers, as available. The newspapers and publication dates are indicated in Table B-5. An example of the announcement in English and Spanish are shown in Figure B-26 and Figure B-27.

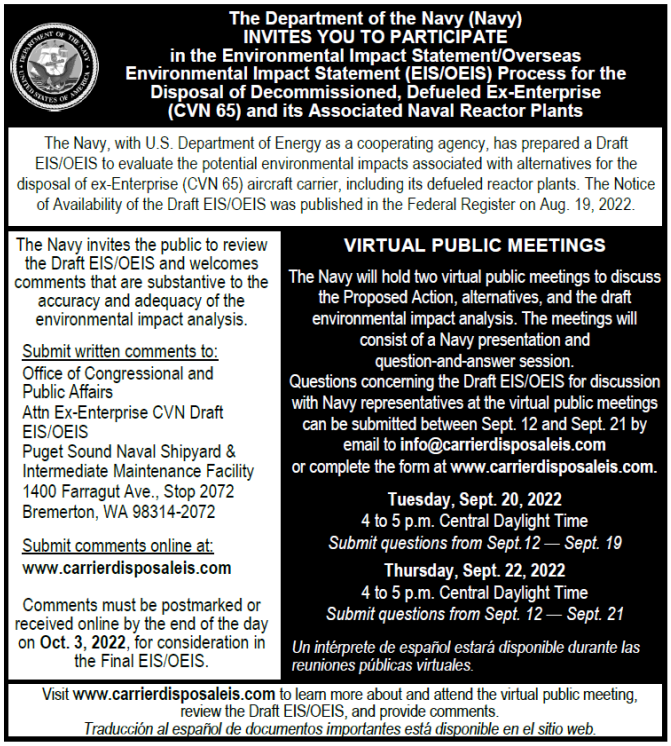
Table B-5: Newspaper Publications for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings

Newspaper	Newspaper Coverage	Publication Dates
The Seattle Times	King County, WA; Statewide	Friday, Aug. 19, 2022 Saturday, Aug. 20, 2022 Sunday, Sept. 18, 2022 Monday, Sept. 19, 2022 Tuesday, Sept. 20, 2022
The Kitsap Sun	Kitsap County, WA	Friday, Aug. 19, 2022 Sunday, Aug. 21, 2022 Sunday, Sept. 18, 2022 Monday, Sept. 19, 2022 Tuesday, Sept. 20, 2022
Tri-City Herald	Tri-County, WA (Serving Richland, Kennewick, and Pasco)	Friday, Aug. 19, 2022 Sunday, Aug. 21, 2022 Sunday, Sept. 18, 2022 Monday, Sept. 19, 2022 Tuesday, Sept. 20, 2022
Tu Decides (Spanish)	Statewide WA and includes northeast Oregon	Thursday, Aug. 25, 2022 Thursday, Sept. 1, 2022 Thursday, Sept. 8, 2022 Thursday, Sept. 15, 2022
The Oregonian	Portland, OR; Statewide	Friday, Aug. 19, 2022 Saturday, Aug. 20, 2022 Friday, Sept. 16, 2022 Saturday, Sept. 17, 2022 Sunday, Sept. 18, 2022
The Portland Tribune	Portland, OR	Wednesday, Aug. 24, 2022 Wednesday, Aug. 31, 2022 Wednesday, Sept. 7, 2022 Wednesday, Sept. 14 2022 Wednesday, Sept. 21, 2022
El Latino de Hoy (Spanish)	Portland, OR; Statewide	Wednesday, Aug. 24, 2022 Wednesday, Aug. 31, 2022 Wednesday, Sept. 7, 2022 Wednesday, Sept. 14 2022 Wednesday, Sept. 21, 2022
The Virginian-Pilot	Norfolk, VA	Friday, Aug. 19, 2022 Saturday, Aug. 20, 2022 Sunday, Sept. 18, 2022 Monday, Sept. 19, 2022 Tuesday, Sept. 20, 2022

Table B-5: Newspaper Publications for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (continued)

Newspaper	Newspaper Coverage	Publication Dates
The Daily Press	Norfolk, VA	Friday, Aug. 19, 2022 Saturday, Aug. 20, 2022 Sunday, Sept. 18, 2022 Monday, Sept. 19, 2022 Tuesday, Sept. 20, 2022
Tidewater Hispanic News (Spanish)	Southeastern VA (including Norfolk, Newport News, and Hampton)	Thursday, Sept. 8, 2022 Online publication: Sept. 8, 2022 through Oct. 8, 2022
Brownsville Herald	Brownsville, TX	Friday, Aug. 19, 2022 Saturday, Aug. 20, 2022 Sunday, Sept. 18, 2022 Monday, Sept. 19, 2022 Tuesday, Sept. 20, 2022
Brownsville Herald (Spanish, online only)	Brownsville, TX	Saturday, Aug. 20, 2022 Sunday, Aug. 21, 2022 Sunday, Sept. 18, 2022 Monday, Sept. 19, 2022 Tuesday, Sept. 20, 2022
Mobile Press Register	Mobile, AL	Friday, Aug. 19, 2022 Sunday, Aug. 21, 2022 Wednesday, Sept. 14, 2022 Friday, Sept. 16, 2022 Sunday, Sept. 18, 2022
Latino News (Spanish)	Alabama counties (with the exception of Mobile County)	Saturday, Aug. 20, 2022 Saturday, Sept. 3, 2022 Saturday, Sept. 10, 2022 Saturday, Sept. 17, 2022

Notes: AL = Alabama, OR = Oregon, TX = Texas, VA = Virginia, WA = Washington



The Department of the Navy (Navy)
INVITES YOU TO PARTICIPATE
in the Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) Process for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants

The Navy, with U.S. Department of Energy as a cooperating agency, has prepared a Draft EIS/OEIS to evaluate the potential environmental impacts associated with alternatives for the disposal of ex-Enterprise (CVN 65) aircraft carrier, including its defueled reactor plants. The Notice of Availability of the Draft EIS/OEIS was published in the Federal Register on Aug. 19, 2022.

The Navy invites the public to review the Draft EIS/OEIS and welcomes comments that are substantive to the accuracy and adequacy of the environmental impact analysis.

Submit written comments to:
Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Submit comments online at:
www.carrierdisposaleis.com

Comments must be postmarked or received online by the end of the day on **Oct. 3, 2022**, for consideration in the Final EIS/OEIS.

VIRTUAL PUBLIC MEETINGS

The Navy will hold two virtual public meetings to discuss the Proposed Action, alternatives, and the draft environmental impact analysis. The meetings will consist of a Navy presentation and question-and-answer session.
Questions concerning the Draft EIS/OEIS for discussion with Navy representatives at the virtual public meetings can be submitted between Sept. 12 and Sept. 21 by email to **info@carrierdisposaleis.com** or complete the form at **www.carrierdisposaleis.com.**

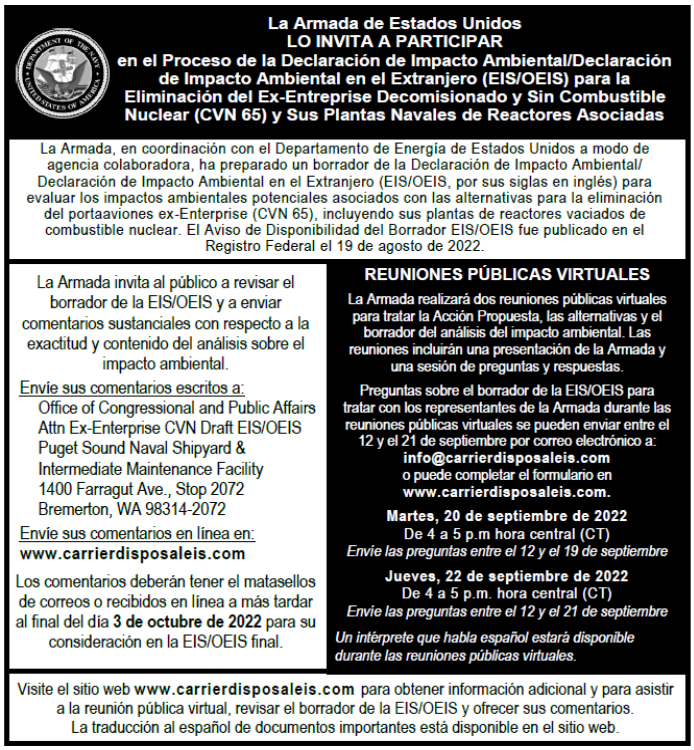
Tuesday, Sept. 20, 2022
4 to 5 p.m. Central Daylight Time
Submit questions from Sept.12 — Sept. 19

Thursday, Sept. 22, 2022
4 to 5 p.m. Central Daylight Time
Submit questions from Sept. 12 — Sept. 21

Un intérprete de español estará disponible durante las reuniones públicas virtuales.

Visit **www.carrierdisposaleis.com** to learn more about and attend the virtual public meeting, review the Draft EIS/OEIS, and provide comments.
Traducción al español de documentos importantes está disponible en el sitio web.

Figure B-26: Newspaper Announcement for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English)



La Armada de Estados Unidos
LO INVITA A PARTICIPAR
en el Proceso de la Declaración de Impacto Ambiental/Declaración de Impacto Ambiental en el Extranjero (EIS/OEIS) para la Eliminación del Ex-Entreprise Decomisionado y Sin Combustible Nuclear (CVN 65) y Sus Plantas Navales de Reactores Asociadas

La Armada, en coordinación con el Departamento de Energía de Estados Unidos a modo de agencia colaboradora, ha preparado un borrador de la Declaración de Impacto Ambiental/ Declaración de Impacto Ambiental en el Extranjero (EIS/OEIS, por sus siglas en inglés) para evaluar los impactos ambientales potenciales asociados con las alternativas para la eliminación del portaaviones ex-Enterprise (CVN 65), incluyendo sus plantas de reactores vaciados de combustible nuclear. El Aviso de Disponibilidad del Borrador EIS/OEIS fue publicado en el Registro Federal el 19 de agosto de 2022.

La Armada invita al público a revisar el borrador de la EIS/OEIS y a enviar comentarios sustanciales con respecto a la exactitud y contenido del análisis sobre el impacto ambiental.

Envíe sus comentarios escritos a:
Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Envíe sus comentarios en línea en:
www.carrierdisposaleis.com

Los comentarios deberán tener el matasellos de correos o recibidos en línea a más tardar al final del día **3 de octubre de 2022** para su consideración en la EIS/OEIS final.

REUNIONES PÚBLICAS VIRTUALES

La Armada realizará dos reuniones públicas virtuales para tratar la Acción Propuesta, las alternativas y el borrador del análisis del impacto ambiental. Las reuniones incluirán una presentación de la Armada y una sesión de preguntas y respuestas.

Preguntas sobre el borrador de la EIS/OEIS para tratar con los representantes de la Armada durante las reuniones públicas virtuales se pueden enviar entre el 12 y el 21 de septiembre por correo electrónico a:
info@carrierdisposaleis.com
o puede completar el formulario en
www.carrierdisposaleis.com.

Martes, 20 de septiembre de 2022
De 4 a 5 p.m hora central (CT)
Envíe las preguntas entre el 12 y el 19 de septiembre

Jueves, 22 de septiembre de 2022
De 4 a 5 p.m. hora central (CT)
Envíe las preguntas entre el 12 y el 21 de septiembre

Un intérprete que habla español estará disponible durante las reuniones públicas virtuales.

Visite el sitio web **www.carrierdisposaleis.com** para obtener información adicional y para asistir a la reunión pública virtual, revisar el borrador de la EIS/OEIS y ofrecer sus comentarios.
La traducción al español de documentos importantes está disponible en el sitio web.

Figure B-27: Newspaper Announcement for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish)

B.3.1.5 News Releases

Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) distributed a news release to local, regional, and national print and broadcast (radio and television) media outlets to coincide with the release of the Notice of Availability and Notice of Virtual Public Meetings on August 19, 2022. A second news release and a public service announcement were distributed to media outlets on September 14, 2022, prior to the virtual public meetings. English and Spanish versions of the news releases were distributed to all media outlets. News releases and public service announcement are shown in Figure B-28, Figure B-29, and Figure B-30.

Puget Sound Naval Shipyard
& Intermediate Maintenance Facility
Congressional and Public Affairs Office
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072
(360) 476-7111 Fax: (360) 476-0937
psns.pao.fct@navy.mil

Release No: 013-22
August 19, 2022

Draft Environmental Impact Statement/Overseas Environmental Impact Statement for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants Available for Public Review and Comment

BREMERTON, Wash. -- The Department of the Navy (Navy), with U.S. Department of Energy as a cooperating agency, has prepared a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate the potential environmental impacts associated with alternatives for the disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier, including its naval reactor plants. The Proposed Action would entail dismantling and recycling the non-radioactive remnant hull sections of ex-Enterprise at a government or authorized commercial facility in accordance with applicable federal, state, and local laws, and removing and packaging of ex-Enterprise reactor plant components for transportation and disposal as low-level radioactive waste to authorized radioactive waste disposal facilities.

The purpose of the Proposed Action is to reduce Navy inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and to dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy. Dismantling is the only method approved for the disposition of nuclear-powered ships stricken from the Naval Vessel Register and is required to be accomplished in the United States or its territories in accordance with the statutory responsibilities of the Naval Nuclear Propulsion Program.

In the Draft EIS/OEIS, the Navy evaluated the potential impacts on environmental resources resulting from activities included in three action alternatives and a No Action Alternative. Direct, indirect, and cumulative impacts were analyzed. The Navy does not anticipate significant environmental impacts resulting from the proposed alternatives with the implementation of best management practices and mitigation measures.

Figure B-28: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Releases for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English)

The Navy identified full Commercial Dismantlement as its preferred alternative. This alternative keeps the specially qualified and trained PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivation and reactor compartment package work that are already part of the PSNS & IMF workload, provides cost benefits to the U.S. taxpayer, would be completed in the shortest duration, and would not result in significant environmental impacts. The preferred alternative does not result in any decrease in workforce at PSNS & IMF.

The Draft EIS/OEIS is available on the project website **www.carrierdisposaleis.com** and at these public libraries:

Kitsap Regional Library
Downtown Bremerton Branch
612 Fifth St.
Bremerton, WA 98337

Richland Public Library
955 Northgate Dr.
Richland, WA 99352

Hampton Public Library
4207 Victoria Blvd.
Hampton, VA 23669

Brownsville Public Library
Main Branch
2600 Central Blvd.
Brownsville, TX 78520

Brownsville Public Library
Southmost Branch
4320 Southmost Blvd.
Brownsville, TX 78521

Ben May Main Library
701 Government St.
Mobile, AL 36602

Virtual Public Meetings

The public is invited to attend virtual public meetings to discuss the Proposed Action, alternatives, and the Draft EIS/OEIS analysis. The Navy has assessed that virtual public meetings are the best format to meet statutory requirements under NEPA while mitigating COVID-19 risks. Two virtual public meetings will be held, consisting of a Navy presentation and question-and-answer session. Visit **www.carrierdisposaleis.com/vpm** to learn more about and attend a virtual public meeting. An audio-only option will also be available.

Tuesday, Sept. 20, 2022
4 to 5 p.m. Central Daylight Time

Thursday, Sept. 22, 2022
4 to 5 p.m. Central Daylight Time

Questions concerning the Draft EIS/OEIS for discussion with Navy representatives at the virtual public meetings can be submitted between Sept. 12 and Sept. 21. Email questions to **info@carrierdisposaleis.com** or complete the form at www.carrierdisposaleis.com. Questions submitted during public meetings are not official public comments. Details for submitting official comments are described below.

Un intérprete de español estará disponible durante las reuniones públicas virtuales. Traducción al español de documentos importantes está disponible en el sitio web.

Figure B-28: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Releases for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English) (continued)

Public Comments
The Navy invites the public to review the Draft EIS/OEIS and welcomes comments that are substantive to the accuracy and adequacy of the environmental impact analysis. The public review and comment period for the Draft EIS/OEIS will be open from Aug. 19, 2022, to Oct. 3, 2022. Comments may be submitted via mail or online. All comments must be postmarked or received online by the end of the day on **Oct. 3, 2022**, for consideration in the Final EIS/OEIS. The administrative record will capture all substantive comments and they will be addressed in the Final EIS.

Mail:
Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Online: **www.carrierdisposaleis.com**

Visit the project website at **www.carrierdisposaleis.com** to learn more and submit comments.

MEDIA AVAILABILITY: Media interested in attending a virtual public meeting or seeking further information should contact Puget Sound Naval Shipyard & Intermediate Maintenance Facility Office of Congressional and Public Affairs at 360-476-7111.

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Figure B-28: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Releases for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English) (continued)

Puget Sound Naval Shipyard
& Intermediate Maintenance Facility
Congressional and Public Affairs Office
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072
(360) 476-7111 Fax: (360) 476-0937
psns.pao.fct@navy.mil

Release No: 014-22
September 14, 2022

Navy to Hold Virtual Public Meetings for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants Draft Environmental Impact Statement/Overseas Environmental Impact Statement

BREMERTON, Wash. -- The public is invited to attend virtual public meetings to learn about the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) prepared for the disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier, including its naval reactor plants. The Department of the Navy (Navy), with U.S. Department of Energy as a cooperating agency, are seeking public input and involvement, which are fundamental aspects of the EIS/OEIS development process under the National Environmental Policy Act.

The Navy is holding two virtual public meetings to discuss the Proposed Action, alternatives, and the draft environmental impact analysis. The Navy has assessed that virtual public meetings are the best format to meet statutory requirements under NEPA while mitigating COVID-19 risks. Virtual public meetings will consist of a Navy presentation and question-and-answer session. Visit **www.carrierdisposaleis.com/vpm** to learn more about and attend a virtual public meeting. An audio-only option will also be available.

Tuesday, Sept. 20, 2022
4 to 5 p.m. Central Daylight Time

Thursday, Sept. 22, 2022
4 to 5 p.m. Central Daylight Time

Questions concerning the Draft EIS/OEIS for discussion with Navy representatives at the virtual public meetings can be submitted between Sept. 12 and Sept. 21. Email questions to **info@carrierdisposaleis.com** or complete the form at www.carrierdisposaleis.com. Questions submitted during public meetings are not official public comments. Details for submitting official comments are described below.

Figure B-28: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Releases for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English) (continued)

Un intérprete de español estará disponible durante las reuniones públicas virtuales. Traducción al español de documentos importantes está disponible en el sitio web.

Public Comments
The Navy invites the public to review the Draft EIS/OEIS and welcomes comments that are substantive to the accuracy and adequacy of the environmental impact analysis. The public review and comment period for the Draft EIS/OEIS will be open from Aug. 19, 2022, to Oct. 3, 2022. Comments may be submitted via mail or online. All comments must be postmarked or received online by the end of the day on **Oct. 3, 2022**, for consideration in the Final EIS/OEIS. The administrative record will capture all substantive comments and they will be addressed in the Final EIS.

Mail:
Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Online: **www.carrierdisposaleis.com**

Proposed Action
The Proposed Action is to dispose of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier, including its naval reactor plants. The Proposed Action would entail dismantling and recycling the non-radioactive remnant hull sections of ex-Enterprise at a government or authorized commercial facility in accordance with applicable federal, state, and local laws, and removing and packaging of ex-Enterprise reactor plant components for transportation and disposal as low-level radioactive waste to authorized radioactive waste disposal facilities.

The purpose of the Proposed Action is to reduce Navy inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and to dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy. Dismantling is the only method approved for the disposition of nuclear-powered ships stricken from the Naval Vessel Register and is required to be accomplished in the United States or its territories in accordance with the statutory responsibilities of the Naval Nuclear Propulsion Program.

In the Draft EIS/OEIS, the Navy evaluated the potential impacts on environmental resources resulting from activities included in three action alternatives and a No Action Alternative. Direct, indirect, and cumulative impacts were analyzed. The Navy does not anticipate significant environmental impacts resulting from the proposed alternatives with the implementation of best management practices and mitigation measures.

The Navy identified full Commercial Dismantlement as its preferred alternative. This alternative keeps the specially qualified and trained PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivation and reactor compartment package work that

Figure B-28: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Releases for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English) (continued)

are already part of the PSNS & IMF workload, provides cost benefits to the U.S. taxpayer, would be completed in the shortest duration, and would not result in significant environmental impacts. The preferred alternative does not result in any decrease in workforce at PSNS & IMF.

The Draft EIS/OEIS is available on the project website **www.carrierdisposaleis.com** and at these public libraries:

Kitsap Regional Library
Downtown Bremerton Branch
612 Fifth St.
Bremerton, WA 98337

Richland Public Library
955 Northgate Dr.
Richland, WA 99352

Hampton Public Library
4207 Victoria Blvd.
Hampton, VA 23669

Brownsville Public Library
Main Branch
2600 Central Blvd.
Brownsville, TX 78520

Brownsville Public Library
Southmost Branch
4320 Southmost Blvd.
Brownsville, TX 78521

Ben May Main Library
701 Government St.
Mobile, AL 36602

Visit the project website at **www.carrierdisposaleis.com** to learn more and submit comments.

MEDIA AVAILABILITY: Media interested in attending a virtual public meeting or seeking further information should contact Puget Sound Naval Shipyard & Intermediate Maintenance Facility Office of Congressional and Public Affairs at 360-476-7111.

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Figure B-28: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Releases for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (English) (continued)

Puget Sound Naval Shipyard
& Intermediate Maintenance Facility
Congressional and Public Affairs Office
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072
(360) 476-7111 Fax: (360) 476-0937
psns.pao.fct@navy.mil

Comunicado de prensa N.°: 013-22
19 de agosto de 2022

Borrador de la Declaración del Impacto Medioambiental/Declaración del Impacto Medioambiental en el Extranjero para la Eliminación del Ex-Enterprise Decomisionado y Sin Combustible Nuclear (CVN 65) y Sus Plantas de Reactores Navales Asociadas Disponible para la Revisión y Comentarios del Público

BREMERTON, Wash. -- El Departamento de la Armada (Armada), en coordinación con el Departamento de Energía de EE. UU. como agencia colaboradora, ha preparado un Borrador de la Declaración de Impacto Ambiental/Declaración de Impacto Ambiental en el Extranjero (EIS/OEIS) para evaluar los posibles impactos ambientales asociados con las alternativas para la eliminación del portaaviones ex-Enterprise decomisionado y sin combustible nuclear (CVN 65), incluyendo sus plantas de reactores navales. La Acción Propuesta implicará el desmantelamiento y el reciclaje de las secciones del casco remanente no radioactivas del ex-Enterprise en una instalación del gobierno o en una instalación comercial autorizada de acuerdo con las leyes federales, estatales y locales en vigor, y la remoción y embalaje de los componentes de las plantas de reactores del ex-Enterprise para su transporte y eliminación como residuo radioactivo de bajo nivel en instalaciones de eliminación de desechos radioactivos autorizadas.

El objetivo de la acción propuesta es reducir el inventario de buques inactivos de la Armada, eliminar los costos asociados con el mantenimiento del buque en condiciones de almacenamiento seguro y eliminar los residuos peligrosos y de legado radiológico de manera responsable con el medio ambiente, a la vez que se da cumplimiento a las necesidades operativas de la Armada. El desmantelamiento es el único método aprobado para la eliminación de los barcos de propulsión nuclear del Registro de Barcos Navales, dicho desmantelamiento se requiere llevar a cabo en los Estados Unidos o en sus territorios de acuerdo con las responsabilidades estatuarias del Programa de Propulsión Nuclear de la Armada.

En el borrador de la EIS/OEIS, la Armada evaluó los impactos potenciales en los recursos medioambientales resultantes de las actividades incluidas en las tres alternativas de acción y la

Figure B-29: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Releases for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish)

alternativa de No Acción. Se analizaron los impactos directos, indirectos y acumulativos. La Armada no anticipa impactos ambientales significativos resultantes de las alternativas propuestas con la implementación de las mejores prácticas de administración y medidas de mitigación.

La Armada identificó el Desmantelamiento Comercial completo como su alternativa preferida. Esta alternativa mantiene a la fuerza laboral especialmente calificada y capacitada de PSNS & IMF enfocada en el trabajo de mantenimiento de alta prioridad de la flota y la inactivación de submarinos y el embalaje del compartimiento del reactor que ya forman parte del trabajo de PSNS & IMF, brinda beneficios de costos para el contribuyente estadounidense, sería completado en la duración más corta, y no daría lugar a impactos ambientales significativos. La alternativa preferida no resulta en una disminución de la fuerza laboral en PSNS & IMF.

El borrador de la EIS/OEIS está disponible en el sitio web del proyecto **www.carrierdisposaleis.com** y en las siguientes bibliotecas públicas:

Kitsap Regional Library
Downtown Bremerton Branch
612 Fifth St.
Bremerton, WA 98337

Richland Public Library
955 Northgate Dr.
Richland, WA 99352

Hampton Public Library
4207 Victoria Blvd.
Hampton, VA 23669

Brownsville Public Library
Main Branch
2600 Central Blvd.
Brownsville, TX 78520

Brownsville Public Library
Southmost Branch
4320 Southmost Blvd.
Brownsville, TX 78521

Ben May Main Library
701 Government St.
Mobile, AL 36602

Reuniones públicas virtuales
El público está invitado a asistir a las reuniones públicas virtuales para tratar la Acción Propuesta, las alternativas y el análisis del borrador sobre el impacto medioambiental. La Armada ha determinado que las reuniones públicas virtuales ofrecen la mejor manera para cumplir los requerimientos estatuarios conforme a la Acta de Política Nacional del Medioambiente (NEPA) al tiempo que mitiga los riesgos de COVID-19. Se celebrarán dos reuniones públicas virtuales, con una presentación de la Armada y una sesión de preguntas y respuestas. Visite el sitio web **www.carrierdisposaleis.com/vpm** para obtener información adicional y para asistir a una reunión pública virtual. También habrá disponible una opción de sólo audio.

Martes, 20 de septiembre de 2022
De 4 a 5 p.m. hora central (CT)

Jueves, 22 de septiembre de 2022
De 4 a 5 p.m. hora central (CT)

Figure B-29: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Release for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish) (continued)

Las preguntas relacionadas con el Borrador EIS/OEIS para su discusión con los representantes de la Armada en las reuniones públicas virtuales se pueden enviar entre el 12 y el 21 de septiembre. Envíe sus preguntas por correo electrónico a **info@carrierdisposaleis.com** o complete el formulario en www.carrierdisposaleis.com. Las preguntas enviadas durante las reuniones públicas no son comentarios públicos oficiales. Los detalles para enviar comentarios oficiales se describen a continuación.

Un intérprete de español estará disponible durante las reuniones públicas virtuales. Traducción al español de documentos importantes está disponible en el sitio web.

Comentarios del público
La Armada invita al público a que revise el Borrador de la EIS/OEIS y aprecia los comentarios sustanciales con respecto a la exactitud y contenido del análisis sobre el impacto ambiental. El período de revisión y comentarios del público para el borrador de la EIS/OEIS estará abierto del 19 de agosto de 2022 al 3 de octubre de 2022. Los comentarios se pueden enviar por correo postal o en línea. Los comentarios deberán tener el matasellos de correos o recibidos en línea a más tardar al final del día 3 de octubre de 2022 para su consideración en la EIS/OEIS final. El registro administrativo capturará todos los comentarios sustantivos y se abordarán en el EIS Final.

Correo postal:
Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

En línea: **www.carrierdisposaleis.com**

Visite el sitio web del proyecto en **www.carrierdisposaleis.com** para obtener información adicional y enviar los comentarios.

DISPONIBILIDAD PARA LOS MEDIOS DE COMUNICACIÓN: Los medios de comunicación interesados en asistir a una reunión pública virtual o que deseen información adicional deberían contactar con la Oficina del Congreso y Relaciones Públicas del Astillero Naval de Puget Sound e Instalación de Mantenimiento Intermedio llamando el número 360-476-7111.

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Figure B-29: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Release for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish) (continued)

Puget Sound Naval Shipyard
& Intermediate Maintenance Facility
Congressional and Public Affairs Office
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072
(360) 476-7111 Fax: (360) 476-0937
psns.pao.fct@navy.mil

Comunicado de prensa N.°: 014-22
14 de septiembre de 2022

La armada va a ofrecer reuniones públicas virtuales sobre el Borrador de la Declaración del Impacto Ambiental/Declaración del Impacto Ambiental en el Extranjero para la Eliminación del Ex-Enterprise Decomisionado y Sin Combustible Nuclear (CVN 65) y Sus Plantas de Reactores Navales Asociadas

BREMERTON, Wash. – El público está invitado a asistir a las reuniones públicas virtuales para conocer el Borrador de la Declaración del Impacto Ambiental/Declaración sobre el Impacto Ambiental en el Extranjero (EIS/OEIS) preparado para la eliminación del portaaviones ex-Enterprise decomisionado y sin combustible nuclear (CVN 65) incluyendo sus plantas de reactores navales. El Departamento de la Armada (Armada), en coordinación con el Departamento de Energía de EE. UU. como agencia colaboradora, está buscando los comentarios y la participación del público, los cuales son aspectos fundamentales del proceso de desarrollo de la EIS/OEIS conforme a la Acta de Política Nacional del Medioambiente.

La Armada va a ofrecer dos reuniones públicas virtuales para tratar la Acción Propuesta, las alternativas y el análisis del borrador sobre el impacto medioambiental. La Armada ha determinado que las reuniones públicas virtuales ofrecen la mejor manera para cumplir los requerimientos estatuarios conforme a la Acta de Política Nacional del Medioambiente (NEPA) al tiempo que mitiga los riesgos de COVID-19. Las reuniones públicas virtuales consistirán de una presentación de la Armada y una sesión de preguntas y respuestas. Visite el sitio web **www.carrierdisposaleis.com/vpm** para obtener más información y para asistir a una reunión pública virtual. También habrá disponible una opción de sólo audio.

Martes, 20 de septiembre de 2022
De 4 a 5 p.m. hora central (CT)

Jueves, 22 de septiembre de 2022
De 4 a 5 p.m. hora central (CT)

Las preguntas relacionadas con el Borrador EIS/OEIS para su discusión con los representantes de la Armada en las reuniones públicas virtuales se pueden enviar entre el 12 y el 21 de septiembre. Envíe sus preguntas por correo electrónico a **info@carrierdisposaleis.com** o complete el

Figure B-29: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Release for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish) (continued)

alternativa de No Acción. Se analizaron los impactos directos, indirectos y acumulativos. La Armada no anticipa impactos ambientales significativos resultantes de las alternativas propuestas con la implementación de las mejores prácticas de administración y medidas de mitigación.

La Armada identificó el Desmantelamiento Comercial completo como su alternativa preferida. Esta alternativa mantiene a la fuerza laboral especialmente calificada y capacitada de PSNS & IMF enfocada en el trabajo de mantenimiento de alta prioridad de la flota y la inactivación de submarinos y el embalaje del compartimiento del reactor que ya forman parte del trabajo de PSNS & IMF, brinda beneficios de costos para el contribuyente estadounidense, sería completado en la duración más corta, y no daría lugar a impactos ambientales significativos. La alternativa preferida no resulta en una disminución de la fuerza laboral en PSNS & IMF.

El borrador de la EIS/OEIS está disponible en el sitio web del proyecto **www.carrierdisposaleis.com** y en las siguientes bibliotecas públicas:

Kitsap Regional Library
Downtown Bremerton Branch
612 Fifth St.
Bremerton, WA 98337

Richland Public Library
955 Northgate Dr.
Richland, WA 99352

Hampton Public Library
4207 Victoria Blvd.
Hampton, VA 23669

Brownsville Public Library
Main Branch
2600 Central Blvd.
Brownsville, TX 78520

Brownsville Public Library
Southmost Branch
4320 Southmost Blvd.
Brownsville, TX 78521

Ben May Main Library
701 Government St.
Mobile, AL 36602

Reuniones públicas virtuales

El público está invitado a asistir a las reuniones públicas virtuales para tratar la Acción Propuesta, las alternativas y el análisis del borrador sobre el impacto medioambiental. La Armada ha determinado que las reuniones públicas virtuales ofrecen la mejor manera para cumplir los requerimientos estatuarios conforme a la Acta de Política Nacional del Medioambiente (NEPA) al tiempo que mitiga los riesgos de COVID-19. Se celebrarán dos reuniones públicas virtuales, con una presentación de la Armada y una sesión de preguntas y respuestas. Visite el sitio web **www.carrierdisposaleis.com/vpm** para obtener información adicional y para asistir a una reunión pública virtual. También habrá disponible una opción de sólo audio.

Martes, 20 de septiembre de 2022
De 4 a 5 p.m. hora central (CT)

Jueves, 22 de septiembre de 2022
De 4 a 5 p.m. hora central (CT)

Figure B-29: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Release for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish) (continued)

En el borrador de la EIS/OEIS, la Armada evaluó los impactos potenciales en los recursos medioambientales resultantes de las actividades incluidas en las tres alternativas de acción y la alternativa de No Acción. Se analizaron los impactos directos, indirectos y acumulativos. La Armada no anticipa impactos ambientales significativos resultantes de las alternativas propuestas con la implementación de las mejores prácticas de administración y medidas de mitigación.

La Armada identificó el Desmantelamiento Comercial completo como su alternativa preferida. Esta alternativa mantiene a la fuerza laboral especialmente calificada y capacitada de PSNS & IMF enfocada en el trabajo de mantenimiento de alta prioridad de la flota y la inactivación de submarinos y el embalaje del compartimiento del reactor que ya forman parte del trabajo de PSNS & IMF, brinda beneficios de costos para el contribuyente estadounidense, sería completado en la duración más corta, y no daría lugar a impactos ambientales significativos. La alternativa preferida no resulta en una disminución de la fuerza laboral en PSNS & IMF.

El borrador de la EIS/OEIS está disponible en el sitio web del proyecto **www.carrierdisposaleis.com** y en las siguientes bibliotecas públicas:

Kitsap Regional Library
Downtown Bremerton Branch
612 Fifth St.
Bremerton, WA 98337

Richland Public Library
955 Northgate Dr.
Richland, WA 99352

Hampton Public Library
4207 Victoria Blvd.
Hampton, VA 23669

Brownsville Public Library
Main Branch
2600 Central Blvd.
Brownsville, TX 78520

Brownsville Public Library
Southmost Branch
4320 Southmost Blvd.
Brownsville, TX 78521

Ben May Main Library
701 Government St.
Mobile, AL 36602

Visite el sitio web del proyecto en **www.carrierdisposaleis.com** para obtener más información y enviar los comentarios.

DISPONIBILIDAD PARA LOS MEDIOS DE COMUNICACIÓN: Los medios de comunicación interesados en asistir a una reunión pública virtual o que deseen información adicional deberían contactar con la Oficina del Congreso y Relaciones Públicas del Astillero Naval de Puget Sound e Instalación de Mantenimiento Intermedio llamando el número 360-476-7111.

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Figure B-29: Puget Sound Naval Shipyard & Intermediate Maintenance Facility News Release for the Draft EIS/OEIS Notice of Availability and Notice of Virtual Public Meetings (Spanish) (continued)

Puget Sound Naval Shipyard
& Intermediate Maintenance Facility
Congressional and Public Affairs Office
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072
(360) 476-7111 Fax: (360) 476-0937
psns.pao.fct@navy.mil

Public Service Announcement
September 14, 2022

Virtual public meetings for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants Draft Environmental Impact Statement/Overseas Environmental Impact Statement

(54 Seconds)
FOR IMMEDIATE RELEASE

ANNOUNCER

THE U-S NAVY INVITES THE PUBLIC TO ATTEND VIRTUAL PUBLIC MEETINGS TO LEARN ABOUT THE ENVIRONMENTAL IMPACT ANALYSIS PREPARED FOR THE DISPOSAL OF THE DECOMMISSIONED, DEFUELED EX-ENTERPRISE AIRCRAFT CARRIER TO INCLUDE ITS NAVAL REACTOR PLANTS.

TWO VIRTUAL MEETINGS WILL BE HELD CONSISTING OF A NAVY PRESENTATION FOLLOWED BY A QUESTION AND ANSWER SESSION. THE FIRST VIRTUAL MEETING WILL BE HELD TUESDAY SEPTEMBER TWENTIETH FROM FOUR TO FIVE P-M CENTRAL TIME. THE SECOND VIRTUAL MEETING WILL BE HELD THURSDAY SEPTEMBER TWENTY SECOND FROM FOUR TO FIVE P-M CENTRAL TIME.

YOU CAN LEARN MORE ABOUT THE PROJECT, SUBMIT QUESTIONS FOR THE VIRTUAL PUBLIC MEETING, OR SUBMIT COMMENTS ON THE ENVIRONMENTAL IMPACT ANALYSIS BY VISITING W-W-W DOT CARRIER DISPOSAL E-I-S DOT COM.

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Figure B-30: Puget Sound Naval Shipyard & Intermediate Maintenance Facility Public Service Announcement for the Draft EIS/OEIS Notice of Virtual Public Meetings

B.3.2 Summary of the Draft Environmental Impact Statement/Overseas Environmental Impact Statement Virtual Public Meetings

The Navy assessed that virtual public meetings, using the Zoom for Government webinar platform, were the best format to meet statutory requirements under NEPA while mitigating COVID-19 risks. The Navy's goals in hosting virtual meetings were to provide an opportunity for the public to learn more about the project and the environmental impact analysis, as well as have their questions answered, just as they would at a poster station at an in-person public meeting. The Navy held two virtual public meetings, on September 20, 2022, and September 22, 2022. Interested individuals could attend a virtual public meeting by computer, tablet, mobile device, or telephone. The virtual public meetings consisted of a slide presentation, prepared remarks interpreted into Spanish, and a question-and-answer session to discuss the Proposed Action and the draft environmental impact analysis. A Spanish-language interpreter was available at each virtual public meeting to translate portions of the presentation, such as how to provide questions during the virtual public meeting, and any questions received during the question-and-answer session. Each meeting was scheduled for one hour.

The public was encouraged to ask questions about the Proposed Action or the environmental impact analysis during the virtual public meetings. Questions could also be submitted in advance during a specific timeframe by emailing info@carrierdisposaleis.com or by completing an online form found on the website to be answered during the virtual public meetings. Questions submitted and discussed at the virtual public meetings were not part of the public record. An official public comment could be submitted by mail or on the project website through October 3, 2022.

The Navy promoted the proper commenting channels throughout all the notification materials, website content, and subscriber email notifications, as well as during the virtual public meetings. The presentation portion of the virtual public meetings was recorded, and the Navy posted both the September 20 and September 22, 2022, recordings of the live presentation on the project website for interested parties who were unable to attend. The transcripts for both virtual public meetings were translated into Spanish and uploaded to the project website. The project website contained information the Navy would have presented at in-person open house public meetings, as well as the presentation slides given at the virtual public meetings.

B.3.2.1 Meetings Summary

Table B-6 summarizes the Draft EIS/OEIS public review and comment meetings held on September 20, 2022, and September 22, 2022. In total, 150 members of the public, media, elected officials or staffers, nongovernmental organizations, contractors, and Navy employees attended the two virtual public meetings.

Table B-6: Summary of the Draft EIS/OEIS Virtual Public Meetings

Date/Time	Attendance
Tuesday, September 20, 2022 4 to 5 p.m. Central Daylight Time Meeting Duration: 90 minutes	**Total Attendance: 85** General Public: 70 Navy Personnel or Known Navy Contractors: 15
Media Attendance: • Brad Gunther, WPMI and NBC 15 News • KIRO News Radio • Kyle Hamrick, Lagniappe Mobile	
Notable Attendees: • Andrew Hinkebein, Congressional Staffer from Senator Tommy Tuberville's office (Alabama) • Tim Whitman, Environmental Protection Agency • Gabriel Gruta, Environmental Protection Agency • Naoko Schiffern, Department of Ecology, State of Washington • Emma Reynolds, Department of Ecology, State of Washington • Mohinuddin Khan, Department of Ecology, State of Washington • Ryan Welsh, Virginia Department of Energy • Colin Mitchell, Alabama Department of Environmental Management • Justin Rigdon, Alabama Department of Environmental Management • Mobile Baykeeper	
Date/Time	**Attendance**
Thursday, September 22, 2022 4 to 5 p.m. Central Daylight Time Meeting Duration: 99 minutes	**Total Attendance: 65** General Public: 52 Navy Personnel or Known Navy Contractors: 13
Media Attendance: • Kyle Hamrick, Lagniappe Mobile • Nicholas W. Wilson, Inside Washington Publishers	
Notable Attendees: • Representative Brad Klippert, Washington State Representative • Susan Sturges, Environmental Protection Agency • Layton Little, Mobile Chamber	

B.3.3 Public Comments on the Draft Environmental Impact Statement/Overseas Environmental Impact Statement

Public comments were submitted in the following ways:

- written comment by mail (4 comments)
- written comments via the project website (39 comments)
- email (2 comments)

The Navy received 45 comments from the public during the public review and comment period. Appendix C (Public Comments and Responses) contains the comments received on the Draft EIS/OEIS and the Navy's responses.

The following issues or concerns were raised during the Draft EIS/OEIS public review and comment period.

B.3.3.1 Proposed Action and Alternatives

- disagreement with Naval Reactors Preferred Alternative

- concern about using commercial shipyards for dismantlement rather than established, government-owned facilities, such as PSNS & IMF, and recommendations for how to keep the work at PSNS & IMF if personnel shortage is a concern
- concern that the private sector may have a lack of experience in dismantling Navy nuclear-powered vessels
- concern that Alternative 3 (Preferred Alternative) would produce more low-level radioactive waste than the reactor compartment packaging alternatives (Alternatives 1 and 2)
- concern about using the Port of Mobile because of perceived weakness of regulatory agencies tasked with compliance monitoring and oversight; lack of experience in dismantling and handling non-nuclear hazardous waste; and impacts on cultural resources, such as Africatown, which is on the World Monument Fund List
- concern that under Alternative 3 (Preferred Alternative), reactor plant components would not be disposed of at DOE Hanford Site, which has an established safety record for storing nuclear waste
- concern that dismantlement at commercial facilities would cost U.S. taxpayers more
- concern that a "for-profit" shipyard would focus on making a profit rather than the proper engineering, designing, and building of containment packages
- concern about using a commercial shipyard outside of Washington state, such as Texas, where stealing classified information as a result of government corruption and influence from various drug cartels in Mexico is an issue
- concern that Alternative 3 (Preferred Alternative) will adversely affect the historic vessel by resulting in its destruction
- concern that the Alabama Department of Environmental Management has one of the poorest performance records in the country; therefore, the Navy should not consider Mobile, Alabama, as a proposed commercial dismantlement facility
- disagreement with the findings that infrastructure improvements would not be required under Alternative 3 (Preferred Alternative)
- general support for selecting Alternatives 1, 2, or 3
- Mobile, Alabama, as the location for commercial dismantlement
- a commercial shipyard to boost the commercial sector while freeing up PSNS & IMF for other operational requirements
- questions about general costs (and potential underestimated costs) associated with the dismantlement of ex-Enterprise for each alternative and transport of the reactor compartments, including gross and net profits for commercial shipyards and any compensation for Navy officers previously assigned to the vessel
- question about how many manpower hours would be needed to complete the dismantlement work
- question about whether under Alternative 3 (Preferred Alternative), radiological processing facilities would be needed
- disagreement that the reactor compartment packaging alternatives would not require infrastructure modifications
- concern that the commercial shipyard with the lowest bid would provide unsafe working conditions and facilities, not attract the best workers, and use workers that are a security risk to the country in order to save money
- request for the Navy to consider the former Naval Shipyard at Charleston, South Carolina

- question about whether COVID-19 or acquisition of materials would delay the dismantlement timeline
- recommend the Navy consider an alternative dismantling facility to avoid impacting overburden, vulnerable, and disadvantaged populations
- recommend conducting a thorough evaluation of history of non-compliance and violations; magnitude of regulatory violations, safety, and record keeping violations; history of spill and release; contingency plans and citizen complaints for all proposed dismantlement facilities
- consider contracting commercial companies to perform dismantlement at PSNS & IMF or at other facilities in the Pacific Northwest, particularly in the Portland, OR, area
- question about the length of time for dismantlement and concern about length inconsistencies stated within the Draft EIS/OEIS and compared with other similar projects
- question about the cost and impact of constructing a new barge under Alternative 2
- concern about how the Naval Reactors intends to govern and control radiological work during dismantlement
- concern about impacts on fleet maintenance if dismantlement of ex-Enterprise is conducted
- concern that inaccurate statements of "no in-water work" are included in the Draft EIS/OEIS
- concern that commercial facilities would need to develop radioactive liquid handling processes and radiological administrative processes, such as training, emergency response, and dose monitoring
- request for labor and radioactive dose estimates
- recommend alternatives to dismantlement and disposal of ex-Enterprise, including the following:
    - repurposing into a museum (stationary or floating)
    - refueling the nuclear reactor compartments and returning them to service on another vessel
    - burying and securing ex-Enterprise, flooding the hull, and removing reactor compartments
    - selling to an international ally, like India, to reuse for its own military, or selling to individuals for personal use
    - selling or trading to another country, such as Australia, who has capacity to decommission ex-Enterprise and reuse materials for new Australian Navy vessels
    - recycling the ship overseas, like in Denmark
    - refitting and recommissioning for the U.S. Navy, potentially using ex-Enterprise as a disaster emergency response vessel for humanitarian and disaster relief missions
    - using as a research facility for future propulsion and clean energy projects
    - repurposing in order to reuse as a cargo ship
    - reusing as a dispatchable, floating, nuclear power plant (similar to Russia)
    - turning ex-Enterprise into a recruiting or public relations vessel, with availability for tours and demonstrations for potential recruits
    - using as an artificial reef in the Gulf, off the coast of Alabama, for recreational scuba divers

B.3.3.2 Environmental Impacts

- concern about the greater environmental impacts of Alternative 2 compared to Alternative 1

- concern that Naval Reactors does not accurately estimate the hazardous and nonhazardous waste and radiological waste for each alternative in the Draft EIS/OEIS
- agreement that the Proposed Action is unlikely to have significant effects on ambient air quality, water quality, and wetland resources of the Commonwealth of Virginia
- request that a ship recycling facility emitting regulated amounts of air pollutants obtain appropriate operating or preconstruction permits and comply with all emission requirements
- request for the Navy to take all reasonable precautions to limit emissions of volatile organic compounds and nitrogen oxides by controlling or limiting the burning of fossil fuels
- recommend coordination with the National Oceanic and Atmospheric Administration, National Marine Fisheries Service, and other state regulatory authorities for the management and protection of Atlantic sturgeon, to ensure compliance with protected species legislation
- request that any petroleum releases be reported to the proper state department of environmental quality offices
- request that potential impacts on public water distribution systems or sanitary sewage collection systems be verified by the local utility
- agreement that there are no apparent impacts on public drinking water
- concern about potential bottom scour during docking at PSNS & IMF, which could affect fish habitat, and request for the scour analysis
- request for the Navy to provide a numerical statement indicating how much smaller the draft of the propulsion section would be compared to current aircraft carriers
- request for clarity of what the Navy considers “substantial” when referring to changes to PSNS & IMF infrastructure
- agreement that long-term impacts would not be expected as long as construction and waste disposal activities are completed in accordance with applicable local, state, and federal permits, statues, and regulations
- concern about current cleanup efforts, radioactive waste risks from single shell tanks, and current tank leak rates at DOE Hanford Site, and how reactor compartment packages from ex-Enterprise would exacerbate these concerns
- request for better clarity and definitions of low-level radioactive waste, what is classified as low-level radioactive waste, estimated weight of low-level radioactive waste, and how radiological impacts and exposure were estimated
- concern about environmental leaching and human and environmental impacts
- request for more information on ambient air conditions, National Ambient Air Quality Standards and non-National Ambient Air Quality Standards pollutants, criteria pollutant nonattainment areas, and potential air quality impacts from the proposed project
- request for the Navy to better describe and estimate air emissions from potential construction, maintenance, and operation activities, and provide greater detail on proposed mitigation measures
- request to coordinate sediment testing through the Washington State Dredged Material Management Program for Port of Benton barge slip improvements
- concern about in-water hull cleaning, question about whether an underwater vacuum cleaning system would be used, and recommendation for drydock cleaning
- question about the need for construction stormwater permits and additional best management practices for road modifications
- question about which alternative is environmentally preferred

- question about lead removal and lead impacts
- request to determine activities affecting Virginia's coastal resources or coastal uses with the Virginia Coastal Zone Management Program

B.3.3.3 Public Health and Safety Impacts

- concern about safety issues that could result from commercial facilities "cutting corners"
- comment about the safety record of commercial shipyards versus the safety record of Navy shipyards
- concern about how the Navy would protect workers handling nuclear waste, and question about radiation exposure limits to the labor force and fatality rate on shipyard personnel
- concern about transporting reactor compartments to DOE Hanford Site
- concern that burying nuclear waste is a long-term liability
- concern that inclement weather, such as tornadoes, hurricanes, and hailstorms, could impact the dismantlement process
- include radiological administrative processes, such as training, emergency response, and dose monitoring for commercial facilities
- disagreement with general safety statements found in the Draft EIS/OEIS

B.3.3.4 Transportation Impacts

- concern that the Navy's analysis ignores the current state of existing infrastructure and potential improvements needed to meet safety considerations for transporting low-level radioactive waste containers across aging bridges, roadways, and rail crossings
- concern about vehicle impact routes on Chambers, Fort Bend, and Harris Counties in Texas

B.3.3.5 Socioeconomics and Environmental Justice Impacts

- recommend the Navy identify populations in the affected areas who may have barriers to engagement or access to information based on education level and those who speak English "less than very well"
- recommend including additional regulations and Executive Orders in the environmental justice analysis
- recommend using EJSCREEN, an online mapping tool that combines environmental and demographic data for analyses of populations who may experience environmental impacts
- request to consider whether communities are already experiencing pollution burdens and elevated levels of social or health burdens
- recommend the Navy provide justification for selecting an alternative in a region consisting mainly of low-income and minority populations

B.3.3.6 Mitigation Measures

- support for using best management practices to minimize impacts on water quality and wetlands
- concern that best management practices are not enough and can be perceived as voluntary to a contracted commercial shipyard
- recommend using best management practices to control runoff from construction sites to minimize impacts on surface and groundwater
- recommend the Navy include a draft Construction Emissions Mitigation Plan in the Final EIS/OEIS

- recommend incorporating additional measures to avoid and minimize impacts on communities that are overburdened and underserved
- recommend the establishment and incorporation of an emergency procedures and contingency plan for transporting radioactive waste through disadvantaged communities and for natural disasters

B.3.3.7 Cultural Resources/Historical Significance

- concern about disrespecting ex-Enterprise legacy by choosing dismantlement and disposal rather than repurposing into a museum
- concern about turning ex-Enterprise into "scrap metal"
- request for consultation and additional information (e.g., list of removed items from the ship, historically significant records, full history of the vessel, and inspection reports and surveys describing the condition of the vessel) as the result of ex-Enterprise being eligible for listing in the National Register of Historic Places and since the Port of Brownsville was previously determined eligible for listing in the National Register of Historic Places
- support that under Alternative 3 (Preferred Alternative), any effects on historic properties in the State of Alabama would be temporary in nature and agreement with a determination of no adverse effect on historic properties
- resolve adverse effects between the Navy and the Advisory Council on Historic Preservation by continuing to address the adverse effect caused by the dismantlement and fulfill the Navy's responsibility under Section 106 of the National Historic Preservation Act
- request the Navy resubmit project information and map for an update on natural heritage information if the scope of the project changes and/or six months has passed
- request for the Navy to define, in space and time, how long the transfer of the propulsion space section from the heavy-lift ship to the tug would take to better determine the effects on tribal fishing access
- concern that all vessel and tug traffic for compartment package transport within Puget Sound may interfere with Treaty fishing
- analyze impacts on tribal fishing gear that drifts and is not fixed, and that could be damaged as a result of an increase in non-Navy vessel traffic due to spectators watching the transport
- request for a memento of ex-Enterprise from previous service

B.3.3.8 National Environmental Policy Act

- recommend consulting with Tribal Historic Preservation Offices and other Native American tribes, and including issues raised during consultations and how those issues were addressed in the EIS/OEIS
- recommend including the Confederated Tribes of the Chehalis Reservation and the Squaxin Island Tribe on the list for federally recognized tribes in Washington state
- question whether other agencies outside of the Navy, Naval Reactors, Naval Sea Systems Command, and DOE were considered in alternative development, and if public-private partnerships shaped the alternatives and analysis conclusions
- recommend coordinating with the Environmental Protection Agency Comprehensive Environmental Response, Compensation, and Liability Act remedial program manager and the Comprehensive Environmental Response, Compensation, and Liability Act Stakeholder Team

B.3.3.9 Other

- recommend reading "History of the Development of Zirconium Alloys for Use in Nuclear Reactors," by Admiral H.G. Rickover, for a historical perspective
- recommend map and legend, grammar, table and notes, reference, comparisons, and other editorial updates to improve readability and clarity for the Final EIS/OEIS, in addition to fine-tuning comparisons to other similar projects and improving discussion of radiological exposures
- request confirmation the Navy would comply with all applicable laws and regulations
- request for better clarity and descriptions for various regulations and laws, such as the Atomic Energy Act
- question about whether precedent will be set with choosing a commercial dismantlement facility over government facility for future ships and submarines

B.4 Final Environmental Impact Statement/Overseas Environmental Impact Statement

This Final EIS/OEIS includes updates and revisions to the Draft EIS/OEIS, and a complete set of all comments received on the Draft EIS/OEIS. The Navy's responses to such comments can be found in Appendix C (Public Comments and Responses). Response to public comments may also take other forms, including correction of data, clarifications of and modifications to analytical approaches, and inclusion of additional data or analysis in the Final EIS/OEIS.

The Final EIS/OEIS public review and 30-day wait period will begin with the publication of the Notice of Availability in the FR. The intent of public involvement efforts during the Final EIS/OEIS phase of the NEPA process is to notify the public, stakeholders, and federally recognized tribes of the availability of the document, the start of the 30-day wait period, and the next steps in the NEPA process. New comments that are substantive to the accuracy and adequacy of the environmental impact analysis and received during the 30-day wait period will be addressed in the Record of Decision (ROD).

B.5 Record of Decision

The ROD phase of the NEPA process follows the Final EIS/OEIS 30-day wait period. The ROD will state the decision made, identify alternatives considered, address new comments substantive to the accuracy and adequacy of the environmental impact analysis received on the Final EIS/OEIS that were not previously addressed in the Draft EIS/OEIS, and address mitigation, if needed.

Following the signing of the ROD, the Navy will publish a Notice of Availability of the ROD in the FR. The intent of public involvement efforts during this phase of the NEPA process is to notify the public, stakeholders, and federally recognized tribes of the availability of the ROD and where it can be accessed, the Navy decision to implement or not implement the Proposed Action or selected alternative, the rationale behind that decision, and any commitments to mitigation.

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Environmental Impact Statement/ Overseas Environmental Impact Statement

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants

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Appendix C Public Comments and Responses

This appendix includes public comments submitted during the Draft Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) public comment period and responses from the U.S. Department of the Navy (Navy). Details of the public participation process in the development of this EIS/OEIS is described in detail in Appendix B (Public Involvement and Distribution).

C.1 Background and Summary

The Navy considered and responded to all comments received on the Draft EIS/OEIS, as detailed in this Final EIS/OEIS. Navy responses to comments received during the 45-day public comment period are included in this Appendix. Comment responses were prepared in accordance with 40 Code of Federal Regulations (CFR) 1503 Part 4.

Responses identify, as appropriate, sections of this EIS/OEIS where revisions were made or additional information is provided within this EIS/OEIS.

C.2 Comment Responses and Documents

This section provides comments received during the Draft EIS/OEIS public comment period and associated responses. Personal contact information (i.e., home address, phone number, e-mail address) has been redacted to protect personal and private information. Similar information provided by organizations has not been redacted.

C.2.1 Federal

C.2.1.1 United States Environmental Protection Agency

#	Comment	Response
1.1	Air Quality Comments EPA asks that the Final EIS provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS) and non-NAAQS pollutants, criteria pollutant nonattainment areas, and potential air quality impacts of the proposed project. Such an evaluation is necessary to understand the potential impacts from temporary, long-term, or cumulative degradation of air quality. EPA recommends the Final EIS describe and estimate air emissions from potential construction, maintenance, and operation activities, as well as proposed mitigation measures to minimize those emissions. We recommend an evaluation of the following measures to reduce emissions of criteria air pollutants and hazardous air pollutants (air toxics): • Existing Conditions – We recommend the Final EIS provide a detailed discussion of ambient air conditions, NAAQS, and criteria pollutant nonattainment areas in the vicinity of the project. • Quantify Emissions – We recommend the Final EIS estimate emissions of criteria and hazardous air pollutants (air toxics) from the proposed project and discuss the timeframe for release of these emissions over the lifespan of the project and describe and estimate emissions from potential construction activities, as well as proposed mitigation measures to minimize these emissions. The EIS should also consider any expected air quality/visibility impacts to Class I Federal Areas identified in 40 CFR Part 81, Subpart D. • Specify Emission Sources – We recommend the Final EIS specify all emission sources by pollutant from mobile sources (on and off-	After the close of the comment period, the Environmental Protection Agency (EPA) clarified in an email to the Navy that this comment was inadvertently included in the EPA comment letter and does not apply to this Draft EIS/OEIS. Navy agrees, but is nevertheless providing this comment resolution to EPA Air Quality comments. Section 3.6 (Air Quality) of the Draft EIS/OEIS presents a detailed discussion of criteria pollutants and National Ambient Air Quality Standards and a qualitative discussion of 188 hazardous air pollutants. Table 3.6-1 (National Ambient Air Quality Standards) presents the National Ambient Air Quality Standards. Section 3.6.2.5 (Greenhouse Gases) discusses Greenhouse Gases and the approach to the greenhouse gas impact analysis. Section 3.6.3 (Affected Environment), describes the attainment status of each potentially affected area and compares them to the No Action Alternative and Title V Requirements. Section 3.6.2.6.1 (Emission Sources), describes the emission sources, which are also referenced throughout the Air Quality section. It should also be noted that construction activities are associated with Alternative 2 only. Finally, based on significant distances to Class I areas and short duration activities near the closest Class I area (approximately 35-mile distance during Alternative 3 [Preferred Alternative] ship tow transit), the Navy does not anticipate any significant air quality/visibility impact on Class I Federal Areas as a result of the Proposed Action.

#	Comment	Response
	road), stationary sources (including portable and temporary emission units), fugitive emission sources, area sources, and ground disturbance. This source specific information should be used to identify appropriate mitigation measures and areas in need of the greatest attention. Construction Emissions Mitigation Plan – We recommend the Final EIS include a draft Construction Emissions Mitigation Plan and ultimately adopt this plan in the Record of Decision. We recommend all applicable local, state (e.g., coordination of land-clearing activities with the state air quality agency to determine air quality conditions such as atmospheric inversions prior to performing open burning activities), or Federal requirements (e.g., certification of non-road engines as in compliance with the EPA Tier 4 regulations found at 40 CFR Parts 89 and 1039) be included in the Construction Emissions Mitigation Plan in order to reduce impacts associated with emissions of particulate matter and other toxics from any potential construction-related activities.	
1.2	Water Quality and Aquatic Resources Comments Port of Benton In-Water Work (Dredge Material Management Program) Under Alternative 2, the four dual reactor compartment packages would be transported to and disposed of at the DOE Hanford Site. Due to the heavier weight and larger size of the dual reactor compartment packages associated with this alternative, modifications would be required to the Port of Benton barge slip. If these modifications include any in-water work (e.g., dredging), EPA recommends the sediment testing associated with this project needs to be coordinated through the Washington State Dredged Material Management Program.	If Alternative 2 was selected in the Record of Decision, the Navy would comply with applicable regulations and guidance (e.g., the U.S. Army Corps of Engineers [2021] Dredged Material Evaluation and Disposal Procedures User's Manual) and coordinate with the appropriate agency (e.g., U.S. Army Corps of Engineers).
1.3	Action Agenda for Puget Sound (Clean Water Act) The CEQ NEPA implementing regulations (40 CFR 1502.16(a)(5))	The 2022-2026 Puget Sound Partnership Action Agenda (Action Agenda) would not apply for Alternative 3 (Preferred Alternative). However, the Navy

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	indicate the environmental consequences section shall include a discussion of possible conflicts between the proposed action and the objectives of federal, regional, state, tribal, and local land use plans, policies, and controls. For the Puget Sound area, the Action Agenda for Puget Sound – the Comprehensive Conservation and Management Plan under Clean Water Act Section 320 – is a key regional plan to consider for this purpose (1). The Action Agenda for Puget Sound charts the course to recovery of the nation's largest estuary by volume and complements and incorporates the work of many partners from around Puget Sound to describe regional strategies and specific actions needed to recover Puget Sound. If either Alternative 1 or 2 is selected over the Preferred Alternative, EPA recommends the Final EIS discuss how the project supports or potentially conflicts with the Action Agenda for Puget Sound. Also consider the Implementation Strategies for Puget Sound which lay out the background, approaches, and plans for achieving progress on implementing the Action Agenda for Puget Sound (2) (1. Puget Sound Partnership. 2022-2026 Action Agenda for Puget Sound. https://www.psp.wa.gov/2022AAupdate.php 2. Puget Sound Partnership. Implementation Strategies. https://www.psp.wa.gov/implementation-strategies.php.)	reviewed the Action Agenda and determined that neither Alternative 1 nor Alternative 2 conflict with the goals, strategies, implementing actions and considerations, program targets, or desired outcomes of the Action Agenda. Section 5.2 (Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations) of the Final EIS/OEIS has been revised to identify accord with the Proposed Action and Action Agenda.
1.4	Hull Cleaning (Clean Water Act) EPA is aware of environmental impacts and a court order issued because of the work to dismantle the ex-Independence in Washington State. A consent decree dated 1/29/2020 was finalized between the PUGET SOUNDKEEPER ALLIANCE et al., Plaintiffs, and STATE OF WASHINGTON, Plaintiff-Intervenor v. UNITED STATES DEPARTMENT OF THE NAVY et al, and required, in part, a ten-year moratorium on underwater hull cleaning in Puget Sound, except for cleaning needed to safely dry dock such a ship or conduct hull integrity testing. This resolution was a result of in-water hull cleaning which released approximately 73 dump-truck loads of debris (biofouling, sediment, and paint) into Sinclair Inlet of Puget	Hull cleaning, under all alternatives, would only occur in the Hampton Roads Metropolitan Area, Virginia and would be conducted in accordance with the Uniform National Discharge Standards (UNDS) developed jointly by the Navy and EPA and promulgated by DoD. The UNDS hull husbandry process requires the Navy to first give consideration to one of the dry docking mitigation methods (i.e., dry docking long enough to allow species on the hull to "die off" through desiccation, or cleaning the hull while the ship is in dry dock). If the Navy determines that dry docking is not available or practical, the Navy would next evaluate the various types of in-water hull cleaning technologies available (including vacuum/capture systems) to determine whether those methods are effective and feasible to implement. If vacuum/capture technology is not feasible, then the Navy would clean the hull using the Best

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	Sound. The cleaning also released a significant amount of metals from the ship's "anti-fouling" hull paint that are highly toxic to marine life, such as copper and zinc. This contamination can harm marine life up and down the food chain3. EPA understands the site conditions and state regulation may differ from the locations identified in the Draft EIS and EPA understands that the current Draft EIS prioritizes dry dock cleaning over in-water hull cleaning as well as a lighter cleaning approach to avoid removal of anti-fouling paint and hull material. However, EPA needs to emphasize the importance of this resolution to ensure similar impacts are avoided during the proposed dismantling project and future projects and encourages the Navy to pursue drydock cleaning to the greatest extent practicable for this project. If the Navy determines that cleaning in a drydock is not feasible, EPA expects the Navy to employ an underwater vacuum cleaning system to minimize discharge of debris from the cleaning process, in accordance with 40 CFR 1700.37(b)(3)(iv). (3. https://www.atg.wa.gov/news/news-releases/victory-puget-sound-navy-signs-legally-enforceable-agreement-stop-polluting-puget)	Management Practices (BMPs) outlined in UNDS. The Navy has been researching and testing in-water cleaning methods aimed at capturing and filtering debris removed from Navy ships for many years and continues to do so. This process has not yet identified an in-water cleaning technology with debris capture that is effective on Navy ships; if and when such a technology is identified, the Navy will coordinate with EPA to revise the UNDS regulations to have it included as an approved BMP. In response to your comment, we updated the Final EIS/OEIS to include the updated UNDS citation to the current citation dated August 17, 2020 (85 FR 43465).
1.5	Stormwater (National Pollutant Discharge Elimination System) EPA recommends the Final EIS indicate if road modifications described in Section 3.3.3.3.4 require a construction stormwater National Pollutant Discharge Elimination System permit for ground disturbance over 1-acre and additional Best Management Practice requirements for ground disturbance, such as appropriately designed silt containment structures.	Under Alternative 2, the Navy expects greater than 1 acre would be disturbed. If Alternative 2 is selected, the preparations for the road modifications would include all permits to meet applicable local, state, and federal regulations. In addition, the Navy would collaborate with DOE, including headquarters and applicable site offices, to ensure standing site programs and permits would be met, and also to evaluate whether additional requirements would apply.
1.6	CERCLA Comments Puget Sound Naval Shipyard Site Under Alternatives 1 and 2, the propulsion space section and its eight defueled reactor plants would be transported to the Puget	If either Alternative 1 or 2 are pursued, dismantlement and disposal activities would occur in accordance with existing Comprehensive Environmental Response Compensation and Liability Act (CERCLA) documents such as the institutional control plan for Operable Unit B Marine.

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	Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) in Bremerton, Washington for further dismantlement and disposal at the DOE Hanford Site near Richland, Washington. If either of these alternatives are pursued, please coordinate with the EPA CERCLA remedial program manager (Anne Christopher) for the PSNS site and the CERCLA Stakeholder Team to assure that dismantling activities at PSNS do not adversely affect the CERCLA remedy or on-going investigations. Anne can be reached at (503) 326-6554 or christopher.anne@epa.gov.	
1.7	Coordination with Tribal Governments EPA encourages the Navy to consult with the Tribes and incorporate feedback from the Tribes when making decisions regarding the project. EPA recommends the Draft EIS describe the issues raised during the consultations and how those issues were addressed, consistent with Executive Order 13175, Consultation and Coordination with Indian Tribal Governments.	In accordance with Executive Order (EO) 13175 Consultation and Coordination with Indian Tribal Governments; Department of Defense Instruction 4710.02, Department of Defense Interactions with Federally-Recognized Tribes; and Secretary of the Navy Instruction 11010.14B, Department of the Navy Policy for Consultation with Federally-Recognized Indian Tribes, Alaska Native Tribal Entities, and Native Hawaiian Organizations, the Navy invites government-to-government consultations when Alternative 3 (Preferred Alternative) has the potential to significantly affect Indian lands, tribal rights issues, or protected tribal resources. The Preferred Alternative identified in this EIS/OEIS involves contracted dismantlement and disposal at a commercial shipyard using existing facilities and established processes and techniques. Given that Alternative 3 (Preferred Alternative) has no known potential to affect tribal lands, tribal rights, or protected resources, the Navy does not anticipate negative effects on tribal interests, but would welcome discussions if any issues come to light. For perspective, the Navy began discussing this project with the Suquamish Indian Tribe prior to the Notice of Intent to prepare an EIS/OEIS. In addition, the Navy contacted 63 federally recognized tribes and tribal groups via letter who may have interest in the Proposed Action through notification letters that invited participation in the National Environmental Policy Act (NEPA) process and to submit comments during the Draft EIS/OEIS comment period. Appendix B (Public Involvement and Distribution) identifies federally recognized tribes and tribal groups who received notification letters. No requests for government-to-government consultation were received. During the Draft

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		EIS/OEIS comment period, one Tribe (the Suquamish Indian Tribe) submitted a comment letter. The Final EIS/OEIS Section 3.3 (American Indian Tribal Resources and Tribal Rights) identifies correspondence with the Suquamish Indian Tribe and has been updated accordingly to reflect communications with the Suquamish Indian Tribe in response to the Draft EIS/OEIS. Direct responses to comments provided by the Suquamish Indian Tribe are included in this appendix.
1.8	Environmental Justice (EJ) EJ remains a high priority for EPA when evaluating impacts from projects. It's important to note that EJ evaluations and the effects a project may have on communities with EJ concerns are not always limited to the immediate project area or buffer. EPA encourages the Navy to conduct outreach in the effected neighborhoods and take into consideration the effects in-water work or haul routes will have on the community's exposure to potential hazardous materials.	Impacts on Environmental Justice were evaluated and discussed in Section 3.4 (Socioeconomics and Environmental Justice) of this EIS/OEIS. The Navy conducted extensive outreach, including engagements with stakeholders, federally recognized tribes, and the public, including environmental justice communities. The Navy took broadened efforts to notify and inform the public beyond those required by NEPA. The Navy prepared materials to notify the public of the availability of the Draft EIS/OEIS for review and comment and provide information about the Proposed Action, virtual public meetings, and opportunities for the public to submit comments. This was accomplished by posting project information and notices of public meetings through the Federal Register, local and regional newspaper advertisements, stakeholder letters, tribal letters, news releases, public service announcements, email notifications, and postcard mailers. Materials were provided in both Spanish and English languages. In addition, the Navy completed outreach related to general Naval Nuclear Propulsion Program (NNPP) history and practice prior to the publication of the Draft EIS/OEIS through in-person meetings in Mobile, Alabama, and Brownville, Texas, in July and August of 2022, respectively. Community representatives and members of Environmental Justice communities attended the public meetings and the separate outreach meetings. Impacts related to hazardous materials were evaluated and discussed in Section 3.2 (Hazardous and Radioactive Waste Management) of this EIS/OEIS, including transport of waste. All action alternatives had no impact or minimal impact due to hazardous materials. In addition, Section 3.4 (Socioeconomics and Environmental Justice) discusses evaluation of impacts on environmental justice communities and concluded that although there are environmental

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		justice populations in the Regions of Influence (ROIs) for Alternative 3 (Preferred Alternative), impacts associated with the dismantlement and disposal of ex-Enterprise are anticipated to be minimal with risks consistent with ongoing work in the areas. The analysis concludes that no disproportionate impacts on environmental justice populations would occur.
1.9	EPA recommends the use of the EJSCREEN tool, a publicly accessible online mapping system that combines environmental and demographic data to enable analyses of populations who may experience adverse environmental impacts. In addition to data concerning communities of color and low-income populations, the tool provides demographic data regarding linguistic isolation, education, and age, all of which may enhance EJ-related analyses and outreach that is already provided in the Draft EIS. EJSCREEN is available at: https://www.epa.gov/ejscreen. In addition, it may be helpful to mention and consider any information from a new screening tool released by CEQ titled Climate and Economic Justice Screening Tool. https://screeningtool.geoplatform.gov/en/	Following receipt of this and other comments, the Navy has added the EJSCREEN Tool report to the Final EIS/OEIS in Appendix G (Socioeconomic Analysis Comparison). The EPA EJSCREEN is sourced from the U.S. Census Bureau American Community Survey (ACS) 5-Year Estimates. The data source included in Section 3.4 (Socioeconomics and Environmental Justice) was also obtained from the U.S. Census Bureau but utilized the ACS 1-Year Estimates instead of the ACS 5-Year Estimates. Using the U.S. Census Bureau ACS 1-Year Estimates in Section 3.4 (Socioeconomics and Environmental Justice) provided the most current data over a 12-month period for the geographic areas. The U.S. Census Bureau ACS 5-Year Estimates data is collected over a 60-month period, which does not provide the most current data. The dataset in Section 3.4 (Socioeconomics and Environmental Justice) was from 2019 while EJSCREEN dataset is currently displaying a 2016–2020 dataset. A comparison between Section 3.4 (Socioeconomics and Environmental Justice) data and EJSCREEN data will be different because they are based on data from two different time periods. That being said, the original conclusions in the Draft EIS remain unchanged under the rubric of the EJ screening tool. The potential impacts on community demographics and housing related to environmental justice populations were evaluated based on EO 12898, *Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations,* which requires consideration of whether the Proposed Action and alternatives would disproportionately affect minority or low-income groups. Socioeconomic changes related to direct expenditures in the local community were based on housing values, employment, or the population (either increases or decreases). This data was used to identify potential impacts from the transportation, dismantlement, and disposal of ex-Enterprise on the human environment, including environmental justice populations, in the ROI.

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		Section 3.4 (Socioeconomics and Environmental Justice) addresses the characteristics of low-income and minority populations, and aspects of the human environment that involves economic and social conditions associated with the human environment. The Climate and Economic Justice Screening Tool (CEJST) is a new tool that was released in November 2022 and is in a beta version. The beta version of CEJST was made available for testing and feedback, thus it is still in a developmental phase. The CEJST website also notes that the tool has limited datasets and will be regularly updated while in beta version. Because of this, the CEJST may not be reliable in providing accurate estimates of data. Therefore, information from CEJST was not considered for Section 3.4 (Socioeconomics and Environmental Justice).
1.10	EPA recommends the Draft EIS consider and disclose impacts to communities with EJ concerns from this project in light of impacts from past, present, and reasonably foreseeable planned actions. EPA recommends the Navy consider whether communities may already be experiencing existing pollution burdens and an elevated level of social/health burdens. The Draft EIS should address how the proposed action may potentially result in disproportionate impact in that context.	Section 3.4 (Socioeconomics and Environmental Justice) describes environmental trends and reasonably foreseeable planned activities in the project's ROI. The baseline for identifying the socioeconomic conditions was derived using relevant published information from sources that include federal and state government agencies and databases. Previous environmental studies were also reviewed. This data was used to identify potential impacts from ex-Enterprise transportation, dismantlement, and disposal on the human environment, including environmental justice populations, in the ROI. As indicated in Section 4 (Cumulative Impact), impacts on socioeconomic resources would be temporary and activities associated with the Proposed Action would not result in disproportionate impacts on environmental justice populations. There would be no significant cumulative impact on socioeconomic resources or disproportionate impacts on environmental justice populations in the ROI as a result of the Proposed Action and other projects in the area. The affected environment related to each resource area, including public and occupational health and safety, biological resources, and air quality, is described for each of the areas analyzed. The Proposed Action and alternatives did not have significant impact on the environment for any of the alternatives analyzed.

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1.11	EPA recommends obtaining and complying with all local, state, and federal permit requirements while considering EJ and incorporating additional measures to avoid and minimize impacts to communities that are overburdened and underserved.	Implementation of the Proposed Action and alternatives for the Draft EIS/OEIS would comply with applicable federal, state, and local laws, regulations, and executive orders. The Navy has consulted with regulatory agencies, as appropriate, during the NEPA process and prior to implementation of the Proposed Action and alternatives to ensure that requirements are met. Impacts on socioeconomic resources would be temporary, and activities associated with the Proposed Action would not result in disproportionate impacts on environmental justice populations. Therefore, additional measures are not necessary.
1.12	EPA recommends the Navy take in consideration the cumulative effect this project will have on minority and low-income populations in the surrounding area of the facilities and the disproportionate adverse of additional stressors.	Cumulative impacts were considered in Chapter 4 (Cumulative) of this EIS/OEIS for all resource areas, including minority and low-income populations in the surrounding area. Based on the analysis, the incremental contribution of the action alternatives would not contribute meaningfully to any potential significant cumulative impact on any of the resource areas. All activities associated with the Proposed Action would comply with all applicable federal, state, and local environmental and occupational safety and health laws, and regulations.
1.13	We recommend the Navy provide a legitimate justification for selecting an alternative which the Region of Influence would consist mainly of low-income and minority populations.	In Section 2.3 (Alternatives Carried Forward for Analysis) of this EIS/OEIS, the Navy outlines the selection criteria for potential dismantlement locations and includes, among others, (1) partial or complete dismantlement work occurs in the United States ,and (2) partial or complete dismantlement work facilities have no limitations for work with radioactive material that would prevent removal of radioactive material from ex-Enterprise and shipping low-level radioactive waste and low-level mixed waste to an existing disposal facility. Although minority and low-income populations exist in the Virginia, Texas, and Alabama regions of influence (as well as locations in Washington state for Alternatives 1 and 2), the locations analyzed within the alternatives meet the selection criteria. Additionally, these locations have existing commercial industries capable of completing maintenance, dismantlement, and disposal work that would be required for the Proposed Action. The Navy is unaware of

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		other geographical areas able and willing to perform the work described in the Proposed Action. In accordance with the Council on Environmental Quality Regulations, 40 CFR Part 1505.2 and EO 12898, the Navy will sign a Record of Decision (ROD) that provides the rationale for selecting one of the alternatives. The alternative selection in the ROD would not identify the facility or location. The final commercial location for partial or complete dismantlement would be determined through a competitive bidding process following the completion of this EIS/OEIS. In the event Alternative 3 (Preferred Alternative) is selected in the ROD, the Navy plans to draft and issue Requests for Proposals that would explain the minimum needs of the government accurately and unambiguously. The competition for the potential contract will be full and open, consistent with federal statute and regulation, and geographical restrictions cannot be used to exclude offerors. Potential offerors will be required to comply with all applicable environmental protections laws and regulations. At this time the Navy is not aware of any federal contracting requirements which permit using the existence of low-income and minority population areas as part of the selection criteria for bidding companies.
1.14	EPA recommends the Navy consider an Alternative/dismantling facility which would avoid subjecting already overburden, vulnerable and disadvantage populations to further harmful exposure and prevent those impacted communities from being influenced to live in unwarranted and unsafe conditions.	The screening and selection criteria for the Proposed Action is provided in Sections 2.2 (Screening Criteria) and 2.3 (Alternatives Carried Forward for Analysis) of this EIS/OEIS. The locations analyzed within the alternatives have established capabilities for maintenance, dismantlement, and disposal work that are required for the Proposed Action. The potential commercial dismantlement facilities already conduct similar activities as the Proposed Action and activities associated with the dismantlement of ex-Enterprise and the Proposed Action would not increase, but rather continue this type of work. Although minority and low-income populations exist in the Virginia, Texas, and Alabama ROIs, adherence to best management practices and regulations reduce potential impacts on the general population and environmental justice populations. Therefore, Alternative 3 (Preferred Alternative) is not anticipated to further contribute to existing impacts or disproportionately impact low-income or minority populations.

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		In the event Alternative 3 (Preferred Alternative) is selected in the Record of Final Decision, the Navy plans to draft and issue Requests for Proposals that will explain the minimum needs of the government accurately and unambiguously. The competition for the potential contract will be full and open, consistent with federal statute and regulation, and geographical restrictions cannot be used to exclude offerors. Potential offerors will be required to comply with all environmental protection laws and regulations.
1.15	We recommend the Navy and DOE establish and incorporate within the Draft EIS emergency procedures/contingency plan that will ensure that safety measures are put in place for radioactive material/waste being transported through EJ disadvantage communities and for any unforeseeable natural occurring disaster such as the flooding from extreme events and weather to prevent the release of nuclear radioactive material into the environment.	Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management) provide the detailed analysis for radiological risks from commercial dismantlement. Radiological work and transportation procedures are designed to minimize both the likelihood of an accident and the consequences of an accident, should one occur. Emergency plans and procedures would remain in place to protect health and safety (see Section 3.1.3.4.2 [Complete Dismantlement of ex-Enterprise at Commercial Facility {Includes In-Water Work}]). For all alternatives, the Navy will implement all required Department of Transportation, Nuclear Regulatory Commission (NRC), and Department of Energy (DOE) transportation requirements, including required response preparations. For Alternative 3 (Preferred Alternative), the Navy envisions this work would be conducted in accordance with NRC requirements. For Alternatives 1 and 2 (the reactor compartment packaging alternatives), the work would be conducted according to NNPP requirements. The NRC and NNPP require control of radioactivity during work and adverse weather conditions, and as a result, protect the environment, worker, and public health from adverse impacts. Additionally, for all alternatives, the Navy will ensure coordination and outreach with local emergency responders and community stakeholders. Section 3.4 (Socioeconomics and Environmental Justice) provides analysis of impacts on environmental justice communities. For Navy ships and facilities, the Unified Facilities Criteria governs mooring under several conditions, including heavy weather events. For example, a ship that cannot move out to sea before a storm, like ex-Enterprise, could have its standard mooring lines increased and also run across the pier to make it significantly more difficult for weather to break the ship loose. The Navy

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		would include these criteria, or equivalent, as applicable in requirements in the dismantlement contract. The Unified Facilities Criteria are publicly available at www.wbdg.org.
1.16	EPA recommends the Navy and DOE conduct a thorough evaluation of the dismantling and Treatment Storage and Disposal facilities under consideration, including but not limited to; the facility history of non-compliance and notice of violations; the magnitude of regulatory violations, safety, record keeping violations, history of spill and release, the contingency plan and citizen complaints.	For all alternatives, all RCRA requirements would be met through applicable RCRA permits. For disposal, only licensed authorized disposal locations that comply with applicable federal, state, and local environmental and occupational safety and health laws, and regulations will be used. Individual commercial facilities and their performance records were not analyzed as part of the EIS/OEIS; rather, the areas for analysis were determined based on many factors including the criteria that the area has existing commercial facility or facilities capable of performing the work. The Navy or authorized commercial dismantlement facility would be responsible for contracting with appropriate and licensed facilities for disposal of waste, and all contractors would be required to follow applicable federal, state and local laws. Oversight and performance review of these disposal locations should occur consistent with the applicable or disposal site license. The competition for the potential contract will be full and open, consistent with federal statute and regulation, and past performance will be considered as appropriate. Reviews of contractor past performance are conducted as part of the source selection process for contract award, as described in Federal Acquisition Regulation Part 15.3, which ensure evaluation factors and significant sub-factors representing key areas of importance and emphasis to be considered in the source selection decision. Sources of this information can be obtained from CPARs, the Government-wide evaluation reporting tool for all past performance reports on contracts and orders (Federal Acquisition Regulation 42.15) or directly from the contractors responding to a contract Request for Proposal.
1.17	Range of Alternatives Alternatives with DOE Hanford Site Under Alternative 2, modifications to the Port of Benton barge slip and the transport route to Trench 94 at the DOE Hanford Site could potentially require significant coordination due to the high usage of	EPA preference for Alternative 1 over Alternative 2 is acknowledged. If Alternatives 1 or 2 are selected after the public review process, the Navy would consider the factors noted in the comment and confirm assumptions from previous 1996 and 2012 NEPA analyses.

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	that infrastructure. If the Preferred Alternative is not selected after the public review process and disposal at the DOE Hanford Site is pursued, EPA notes that Alternative 1 with the smaller eight single reactor compartment packages would facilitate easier use of the existing infrastructure, including the hauling equipment that is used once on the DOE Hanford Site, than the larger sized dual reactor compartment packages of Alternative 2. The smaller single reactor compartment packages of Alternative 1 would also help configure the disposal arrangement considering that Trench 94 still has other shipments coming from other surface vessels and submarines. Also considering the additional environmental impacts (e.g., noise, air, biological, cultural, and water quality) from proposed construction, ground disturbances, and in-water work associated with Alternative 2's barge slip and road modifications, EPA suggests that Alternative 1 would be preferred over Alternative 2 if the Preferred Alternative is not selected after the public review process. The Draft EIS (page 2-18) indicates the DOE Hanford Site was previously analyzed to be able to accept additional reactor compartment packages at Trench 94. If Alternatives 1 or 2 are selected after the public review process, EPA suggests confirming assumptions from those previous 1996 and 2012 NEPA analyses which may require coordination with Washington State.	
1.18	Construction Timeline (Bremerton Waterfront Infrastructure Improvements) The Navy is proposing separate improvements of multiple waterfront infrastructure and facilities at PSNS & IMF at Naval Base Kitsap in Bremerton, Washington. EPA appreciates that the cumulative impacts analysis includes the Draft EIS (p. 4.4) for Bremerton Waterfront Infrastructure Improvements at PSNS & IMF. EPA provided scoping comments in July 2022 and requested to be designated as a cooperating agency for the development of the Bremerton Waterfront Infrastructure Improvements EIS. If either Alternative 1 or 2 is selected over the Preferred Alternative, EPA	If either Alternative 1 or 2 are selected, the ROD would include statements regarding the project timelines. As a cooperating agency, EPA Region 10 received an internal draft of the Waterfront draft EIS on January 13, 2023. This document discusses ex-Enterprise in Section 3.1 (Public and Occupational Health and Safety).

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	recommends that the Final EIS expand on the expected construction timeline for the Bremerton Waterfront Infrastructure Improvements and describe how it will align with the timing of proposed Ex-Enterprise work given the likely overlap and proximity of the work at PSNS & IMF.	
1.19	Environmentally Preferrable Alternative It appears based on its substantially lower greenhouse gas emissions, Alternative 3, the Preferred Alternative, may be environmentally preferable when compared to Alternatives 1 and 2. EPA recommends the Final EIS describe the criteria which will be used to ultimately determine the environmentally preferable alternative. EPA recommends the Final EIS include the perspective of DOE, as a cooperating agency, in developing the criteria and include the relative safety of different hazardous waste disposal options.	Alternative 3 (Preferred Alternative) has the lowest GHG emissions of the action alternatives. While the Final EIS/OEIS will not identify the environmentally preferred alternative, the ROD will. The environmentally preferred alternative will be based on many factors, including greenhouse gas emissions, revisions to the Final EIS/OEIS, and further cooperating agency and public input. Hazardous waste disposal facilities are permitted facilities, and those locations are not selected in advance by the EIS/OEIS.
1.20	Editorial Comment for Conceptual Analysis Framework for Alternatives 2 and 3 (Figures 3.5-3 and 3.5-4) Draft EIS Figure 3.5-4 (p. 3.5-16) Conceptual Analysis Framework for the Preferred Alternative appears to erroneously indicate in Notes 3 and 4 that Alternative 3 includes work at the Port of Benton and the DOE Hanford Site. It is likely that these notes are intended for the previous Draft EIS Figure 3.5-3 Conceptual Analysis Framework for Alternative 2 which is missing Notes 4 and 5 (p. 3.5-15). EPA recommends reviewing and correcting these Conceptual Analysis Framework figures in the Final EIS to accurately reflect that no work is proposed at Port of Benton and DOE Hanford Site for Preferred Alternative. We appreciate the opportunity to review the Draft EIS and are available to discuss our comments. Please send our office an electronic copy of the Final EIS when it is electronically filed with the Office of Federal Activities using the following link:	In response to this comment, the Navy concurs with the note correction and has updated the Final EIS/OEIS. To clarify, the Navy Preferred Alternative does not include activities (construction or otherwise) at the Port of Benton or permanent storage at the DOE Hanford Site.

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	https://www.epa.gov/nepa/e-nepa-guide-registration-and-preparing-eis-electronic-submission. If you have any questions, please contact Gabe Gruta, project review lead at 214-665-2174 or gruta.gabriel@epa.gov.	

Comment Document #1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 ELM STREET, SUITE 500
DALLAS, TEXAS 75270-2102

September 30, 2022

Amanda Stuhldreher
Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Avenue, Stop 2072
Bremerton, Washington 98314-2072

Re: Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Associated Naval Reactor Plants

Dear Ms. Stuhldreher:

The U.S. Environmental Protection Agency (EPA) has reviewed the U.S. Department of the Navy (Navy) Draft Environmental Impact Statement (EIS) (CEQ No. 20220117) for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) aircraft carrier and its Associated Naval Reactor Plants. The Draft EIS was reviewed pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500 – 1508), and EPA's authority under Section 309 of the Clean Air Act.

The Navy Proposed Action is to dispose of ex-Enterprise, including its naval reactor plants. Disposal includes dismantling and recycling the hull sections at a government facility or through a contract with an authorized commercial facility (Hampton Roads, Virginia, Brownsville, Texas or Mobile, Alabama) in accordance with applicable federal, state, and local laws, and removing and packaging the reactor plants or components for transportation and disposal as low-level radioactive waste (LLRW) at a U.S. Department of Energy (DOE) authorized radioactive waste facility or facilities.

The EPA's primary concerns are with the Air Quality impacts, Impact to Water Quality and Aquatic Resources, Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) concerns, Tribal and Environmental Justice impacts. We are providing the following detailed comments for your consideration to highlight issues and concerns identified in the Range of Alternatives for the proposed project.

Air Quality Comments

EPA asks that the Final EIS provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS) and non-NAAQS pollutants, criteria pollutant nonattainment areas, and potential air quality impacts of the proposed project. Such an evaluation is necessary to understand the potential impacts from temporary, long-term, or cumulative degradation of air quality. 1.1

EPA recommends the Final EIS describe and estimate air emissions from potential construction, maintenance, and operation activities, as well as proposed mitigation measures to minimize those emissions. We recommend an evaluation of the following measures to reduce emissions of criteria air pollutants and hazardous air pollutants (air toxics):

1.1 (cont.)

- *Existing Conditions* – We recommend the Final EIS provide a detailed discussion of ambient air conditions, NAAQS, and criteria pollutant nonattainment areas in the vicinity of the project.

- *Quantify Emissions* – We recommend the Final EIS estimate emissions of criteria and hazardous air pollutants (air toxics) from the proposed project and discuss the timeframe for release of these emissions over the lifespan of the project and describe and estimate emissions from potential construction activities, as well as proposed mitigation measures to minimize these emissions. The EIS should also consider any expected air quality/visibility impacts to Class I Federal Areas identified in 40 CFR Part 81, Subpart D.

- *Specify Emission Sources* – We recommend the Final EIS specify all emission sources by pollutant from mobile sources (on and off-road), stationary sources (including portable and temporary emission units), fugitive emission sources, area sources, and ground disturbance. This source specific information should be used to identify appropriate mitigation measures and areas in need of the greatest attention.

Construction Emissions Mitigation Plan – We recommend the Final EIS include a draft Construction Emissions Mitigation Plan and ultimately adopt this plan in the Record of Decision. We recommend all applicable local, state (e.g., coordination of land-clearing activities with the state air quality agency to determine air quality conditions such as atmospheric inversions prior to performing open burning activities), or Federal requirements (e.g., certification of non-road engines as in compliance with the EPA Tier 4 regulations found at 40 CFR Parts 89 and 1039) be included in the Construction Emissions Mitigation Plan in order to reduce impacts associated with emissions of particulate matter and other toxics from any potential construction-related activities.

Water Quality and Aquatic Resources Comments

1.2

Port of Benton In-Water Work (Dredge Material Management Program)
Under Alternative 2, the four dual reactor compartment packages would be transported to and disposed of at the DOE Hanford Site. Due to the heavier weight and larger size of the dual reactor compartment packages associated with this alternative, modifications would be required to the Port of Benton barge slip. If these modifications include any in-water work (e.g., dredging), EPA recommends the sediment testing associated with this project needs to be coordinated through the Washington State Dredged Material Management Program.

1.3

Action Agenda for Puget Sound (Clean Water Act)
The CEQ NEPA implementing regulations (40 CFR 1502.16(a)(5)) indicate the environmental consequences section shall include a discussion of possible conflicts between the proposed action and the objectives of federal, regional, state, tribal, and local land use plans, policies, and controls. For the Puget Sound area, the Action Agenda for Puget Sound – the Comprehensive Conservation and Management Plan under Clean Water Act Section 320 – is a key regional plan to consider for this purpose[1]. The Action Agenda for Puget Sound charts the course to recovery

[1] Puget Sound Partnership. 2022-2026 Action Agenda for Puget Sound. https://www.psp.wa.gov/2022AAupdate.php

1.3 (cont.)

of the nation's largest estuary by volume and complements and incorporates the work of many partners from around Puget Sound to describe regional strategies and specific actions needed to recover Puget Sound. If either Alternative 1 or 2 is selected over the Preferred Alternative, EPA recommends the Final EIS discuss how the project supports or potentially conflicts with the Action Agenda for Puget Sound. Also consider the Implementation Strategies for Puget Sound which lay out the background, approaches, and plans for achieving progress on implementing the Action Agenda for Puget Sound[2].

1.4

Hull Cleaning (Clean Water Act)
EPA is aware of environmental impacts and a court order issued because of the work to dismantle the ex-Independence in Washington State. A consent decree dated 1/29/2020 was finalized between the PUGET SOUNDKEEPER ALLIANCE et al., Plaintiffs, and STATE OF WASHINGTON, Plaintiff-Intervenor v. UNITED STATES DEPARTMENT OF THE NAVY et al, and required, in part, a ten-year moratorium on underwater hull cleaning in Puget Sound, except for cleaning needed to safely dry dock such a ship or conduct hull integrity testing. This resolution was a result of in-water hull cleaning which released approximately 73 dump-truck loads of debris (biofouling, sediment, and paint) into Sinclair Inlet of Puget Sound. The cleaning also released a significant amount of metals from the ship's "anti-fouling" hull paint that are highly toxic to marine life, such as copper and zinc. This contamination can harm marine life up and down the food chain[3]. EPA understands the site conditions and state regulation may differ from the locations identified in the Draft EIS and EPA understands that the current Draft EIS prioritizes dry dock cleaning over in-water hull cleaning as well as a lighter cleaning approach to avoid removal of anti-fouling paint and hull material. However, EPA needs to emphasize the importance of this resolution to ensure similar impacts are avoided during the proposed dismantling project and future projects and encourages the Navy to pursue drydock cleaning to the greatest extent practicable for this project. If the Navy determines that cleaning in a drydock is not feasible, EPA expects the Navy to employ an underwater vacuum cleaning system to minimize discharge of debris from the cleaning process, in accordance with 40 CFR 1700.37(b)(3)(iv).

1.5

Stormwater (National Pollutant Discharge Elimination System)
EPA recommends the Final EIS indicate if road modifications described in Section 3.3.3.3.4 require a construction stormwater National Pollutant Discharge Elimination System permit for ground disturbance over 1-acre and additional Best Management Practice requirements for ground disturbance, such as appropriately designed silt containment structures.

CERCLA Comments

1.6

Puget Sound Naval Shipyard Site
Under Alternatives 1 and 2, the propulsion space section and its eight defueled reactor plants would be transported to the Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) in Bremerton, Washington for further dismantlement and disposal at the DOE Hanford Site near Richland, Washington. If either of these alternatives are pursued, please coordinate with the EPA CERCLA remedial program manager (Anne Christopher) for the PSNS

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[2] Puget Sound Partnership. Implementation Strategies. https://www.psp.wa.gov/implementation-strategies.php.
[3] https://www.atg.wa.gov/news/news-releases/victory-puget-sound-navy-signs-legally-enforceable-agreement-stop-polluting-puget

1.6 (cont.) site and the CERCLA Stakeholder Team to assure that dismantling activities at PSNS do not adversely affect the CERCLA remedy or on-going investigations. Anne can be reached at (503) 326-6554 or christopher.anne@epa.gov.

Coordination with Tribal Governments

1.7 EPA encourages the Navy to consult with the Tribes and incorporate feedback from the Tribes when making decisions regarding the project. EPA recommends the Draft EIS describe the issues raised during the consultations and how those issues were addressed, consistent with Executive Order 13175, Consultation and Coordination with Indian Tribal Governments.

Environmental Justice (EJ)

1.8 EJ remains a high priority for EPA when evaluating impacts from projects. It's important to note that EJ evaluations and the effects a project may have on communities with EJ concerns are not always limited to the immediate project area or buffer. EPA encourages the Navy to conduct outreach in the effected neighborhoods and take into consideration the effects in-water work or haul routes will have on the community's exposure to potential hazardous materials.

1.9 EPA recommends the use of the EJSCREEN tool, a publicly accessible online mapping system that combines environmental and demographic data to enable analyses of populations who may experience adverse environmental impacts. In addition to data concerning communities of color and low-income populations, the tool provides demographic data regarding linguistic isolation, education, and age, all of which may enhance EJ-related analyses and outreach that is already provided in the Draft EIS. EJSCREEN is available at: https://www.epa.gov/ejscreen. In addition, it may be helpful to mention and consider any information from a new screening tool released by CEQ titled Climate and Economic Justice Screening Tool. https://screeningtool.geoplatform.gov/en/

1.10 EPA recommends the Draft EIS consider and disclose impacts to communities with EJ concerns from this project in light of impacts from past, present, and reasonably foreseeable planned actions. EPA recommends the Navy consider whether communities may already be experiencing existing pollution burdens and an elevated level of social/health burdens. The Draft EIS should address how the proposed action may potentially result in disproportionate impact in that context.

1.11 EPA recommends obtaining and complying with all local, state, and federal permit requirements while considering EJ and incorporating additional measures to avoid and minimize impacts to communities that are overburdened and underserved.

1.12 EPA recommends the Navy take in consideration the cumulative effect this project will have on minority and low-income populations in the surrounding area of the facilities and the disproportionate adverse of additional stressors.

1.13 We recommend the Navy provide a legitimate justification for selecting an alternative which the Region of Influence would consist mainly of low-income and minority populations.

1.14 EPA recommends the Navy consider an Alternative/dismantling facility which would avoid subjecting already overburden, vulnerable and disadvantage populations to further harmful exposure and prevent those impacted communities from being influenced to live in unwarranted and unsafe conditions.

1.15 We recommend the Navy and DOE establish and incorporate within the Draft EIS emergency procedures/contingency plan that will ensure that safety measures are put in place for radioactive material/waste being transported through EJ disadvantage communities and for any unforeseeable natural occurring disaster such as the flooding from extreme events and weather to prevent the release of nuclear radioactive material into the environment.

1.16 EPA recommends the Navy and DOE conduct a thorough evaluation of the dismantling and Treatment Storage and Disposal facilities under consideration, including but not limited to; the facility history of non-compliance and notice of violations; the magnitude of regulatory violations, safety, record keeping violations, history of spill and release, the contingency plan and citizen complaints.

Range of Alternatives

1.17 **Alternatives with DOE Hanford Site**
Under Alternative 2, modifications to the Port of Benton barge slip and the transport route to Trench 94 at the DOE Hanford Site could potentially require significant coordination due to the high usage of that infrastructure. If the Preferred Alternative is not selected after the public review process and disposal at the DOE Hanford Site is pursued, EPA notes that Alternative 1 with the smaller eight single reactor compartment packages would facilitate easier use of the existing infrastructure, including the hauling equipment that is used once on the DOE Hanford Site, than the larger sized dual reactor compartment packages of Alternative 2. The smaller single reactor compartment packages of Alternative 1 would also help configure the disposal arrangement considering that Trench 94 still has other shipments coming from other surface vessels and submarines. Also considering the additional environmental impacts (e.g., noise, air, biological, cultural, and water quality) from proposed construction, ground disturbances, and in-water work associated with Alternative 2's barge slip and road modifications, EPA suggests that Alternative 1 would be preferred over Alternative 2 if the Preferred Alternative is not selected after the public review process.

The Draft EIS (page 2-18) indicates the DOE Hanford Site was previously analyzed to be able to accept additional reactor compartment packages at Trench 94. If Alternatives 1 or 2 are selected after the public review process, EPA suggests confirming assumptions from those previous 1996 and 2012 NEPA analyses which may require coordination with Washington State.

1.18 **Construction Timeline (Bremerton Waterfront Infrastructure Improvements)**
The Navy is proposing separate improvements of multiple waterfront infrastructure and facilities at PSNS & IMF at Naval Base Kitsap in Bremerton, Washington. EPA appreciates that the cumulative impacts analysis includes the Draft EIS (p. 4.4) for Bremerton Waterfront Infrastructure Improvements at PSNS & IMF. EPA provided scoping comments in July 2022 and requested to be designated as a cooperating agency for the development of the Bremerton

1.18 (cont.) Waterfront Infrastructure Improvements EIS. If either Alternative 1 or 2 is selected over the Preferred Alternative, EPA recommends that the Final EIS expand on the expected construction timeline for the Bremerton Waterfront Infrastructure Improvements and describe how it will align with the timing of proposed Ex-Enterprise work given the likely overlap and proximity of the work at PSNS & IMF.

Environmentally Preferrable Alternative

1.19 It appears based on its substantially lower greenhouse gas emissions, Alternative 3, the Preferred Alternative, may be environmentally preferable when compared to Alternatives 1 and 2. EPA recommends the Final EIS describe the criteria which will be used to ultimately determine the environmentally preferable alternative. EPA recommends the Final EIS include the perspective of DOE, as a cooperating agency, in developing the criteria and include the relative safety of different hazardous waste disposal options.

Editorial Comment for Conceptual Analysis Framework for Alternatives 2 and 3 (Figures 3.5-3 and 3.5-4)

1.20 Draft EIS Figure 3.5-4 (p. 3.5-16) Conceptual Analysis Framework for the Preferred Alternative appears to erroneously indicate in Notes 3 and 4 that Alternative 3 includes work at the Port of Benton and the DOE Hanford Site. It is likely that these notes are intended for the previous Draft EIS Figure 3.5-3 Conceptual Analysis Framework for Alternative 2 which is missing Notes 4 and 5 (p. 3.5-15). EPA recommends reviewing and correcting these Conceptual Analysis Framework figures in the Final EIS to accurately reflect that no work is proposed at Port of Benton and DOE Hanford Site for Preferred Alternative.

We appreciate the opportunity to review the Draft EIS and are available to discuss our comments. Please send our office an electronic copy of the Final EIS when it is electronically filed with the Office of Federal Activities using the following link: https://www.epa.gov/nepa/e-nepa-guide-registration-and-preparing-eis-electronic-submission. If you have any questions, please contact Gabe Gruta, project review lead at 214-665-2174 or gruta.gabriel@epa.gov.

Sincerely,

ROBERT HOUSTON
Digitally signed by ROBERT HOUSTON
Date: 2022.09.30 09:58:46 -05'00'

Robert Houston
Staff Director
Office of Communities, Tribes and Environmental assessment

C.2.2 Tribes

C.2.2.1 The Suquamish Tribe

#	Comment	Response
2.1	Review and Comments on Alternatives 1 and 2. The DEIS states the "Navy determined there would be no significant effects or major impacts on tribal resources and treaty rights resulting from the disposal of decommissioned, defueled naval reactor plants from ex-Enterprise (Navy & DOE, 2012}." Such a statement is premature. The Suquamish Tribe expressed concern for potential bottom scour during docking at PSNS & IMF, which could affect fish habitat. The DEIS states the Navy has: "concluded that scour and propeller wash are not a concern at PSNS & IMF based on calculations of draft maximum, because the heavy-lift ship would unload the propulsion space section in deep water before entering Sinclair Inlet. The propulsion space section would have a smaller draft than current aircraft carriers and would be brought into port under tug." The Navy has not provided the scour analysis to the Tribe for its review. The Navy's response, however, presumes the propulsion section space will be unloaded prior to entering Sinclair Inlet. However, plans can change. Unless Sinclair Inlet is too shallow for the heavy-lift ship to enter, the Navy cannot unequivocally state the heavy-lift ship will not operate in Sinclair Inlet. Indeed, the DEIS tables showing calculated vessel travel distances by type of transport or towing vessel do not appear to have a separate travel distance for the tug that will tow the propulsion unit from where it is unloaded from the heavy-lift ship to PSNS. The qualitative statement that "The propulsion space section would have a smaller draft than current aircraft carriers and would be brought into port under tug" should be replaced by a numerical	If the Navy ultimately selects Alternative 1 or 2, the Navy would consult with the Suquamish Indian Tribe to discuss details. As identified in Section 3.3.3.2.1 (Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility [Following Route Around South America]) of this EIS/OEIS, the Navy has concluded that scour and propeller wash are not a concern at Puget Sound Naval Shipyard & Intermediate Maintenance Facility based on calculations of draft maximum and because the heavy-lift ship would unload the propulsion space section in deep water before entering Sinclair Inlet. The propulsion space section would have a smaller draft (approximately 23.5 feet) than current aircraft carriers (approximately 37 feet) and would be brought into port under tug. Based on the 2007 hydrographic survey (Sinclair Inlet to Rich Passage, Report F00541) by the National Oceanic and Atmospheric Administration, water depths are greater than the draft maximum for the propulsion space section. The draft required by a heavy-lift ship to offload the propulsion space section (approximately 76 feet) is prohibitive to occur in Sinclair Inlet due to water depths. Additional details for offloading the propulsion space section in the Central Basin of Puget Sound would be determined if the Navy ultimately selects Alternative 1 or 2. The travel distances in this EIS/OEIS utilize the heavy-lift ship transiting to Puget Sound Naval Shipyard & Intermediate Maintenance Facility as a conservative scenario for analyses of impacts presented in this EIS/OEIS. Section 3.3.3.2.1 (Ship ex-Enterprise Propulsion Space Section via Heavy-Lift Ship from Commercial Dismantlement Facility to Puget Sound Naval Shipyard & Intermediate Maintenance Facility [Following Route Around South America]) of the Final EIS/OEIS has been updated to reflect quantitative data regarding the propulsion space section and heavy-lift ship and other concerns expressed from the Suquamish Indian Tribe. The propulsion space section transit through the Tribe's usual and accustomed areas (fishing grounds and stations) would be commensurate with the time

#	Comment	Response
	statement indicating how much smaller the draft of the propulsion section would be compared to current aircraft carriers. Additionally, the actions required to transfer the propulsion section from the heavy-lift ship to the tug should be defined in space and time. Without describing how long the transfer operation will take, the location, as the area required, including any security zone, it is premature for the Navy to suggest there will be no significant effects or major impacts on Suquamish's fishing access. Similarly, the distance of the security zone around the propulsion unit as it is under tow should be described. The size of the security zone and how long the propulsion unit takes to transit areas where Treaty fishing occurs will influence the impact. Similar concerns apply to the packages that would be towed under these Alternatives to Vancouver for transfer to a river tug. All vessel and tug traffic associated with this project within Puget Sound have the potential to interfere with the exercise of Treaty fishing. As some fisheries are constrained in time and space, even a small disruption of fishing activity can have considerable impact. Vessels can also damage fishing gear; however, the analysis of gear damage in the DEIS appears be restricted to that which might be caused by the Navy - ""the Navy uses standard navigational practices to avoid potential interactions with fixed gear."" This statement overlooks two issues: (1) some gear is not fixed, but drifts; and (2) the indirect impact of the proposed activity increasing non-navy vessel traffic. The movement of the propulsion unit through Puget Sound is a rare event and would draw spectators in boats of various sizes. But for this activity, an increased density of boats is highly likely in areas used by Suquamish to fish is an indirect impact with the potential to damage fishing gear. Operators of small boats are not as vigilant as Navy or commercial vessel operators in looking for fishing gear. This impact requires analysis. Damage to fishing gear can be severely detrimental to a fisher in terms of lost opportunity, time and gear replacement costs. "	required for live aircraft carrier passage. The anticipated travel speed of the propulsion space section being brought into port is less than 10 knots, with a security zone surrounding the ship of 100 yards (per 33 CFR Part 165). Heavy-lift ship transportation of the propulsion space section and other support tugs to bring the propulsion space section into port would conform to existing maritime transportation operations and procedures, which includes identification and avoidance of maritime fishing gear. It is also anticipated that any fishing gear placed in Washington waters would be marked accordingly per Washington state regulations. Non-Navy ship traffic should still be vigilant during operations in order to avoid maritime hazards per Revised Code of Washington 79A.60. While the Navy provides courtesy notifications to Tribes, the Navy does not notify the public of Navy ship movements, so gathering time for spectators would be limited to when the heavy-lift ship becomes visible in Puget Sound. Responsible authorities would be accountable for enforcing marine law and mitigating nuisances such as congested recreational boaters if issues were to arise.

Comment Document #2

THE SUQUAMISH TRIBE
NATURAL RESOURCES DEPARTMENT
PO Box 498 Suquamish, WA 98392-0498

October 3, 2022

Office of Congressional and Public Affairs
Attn: Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

SUBJECT: Draft EIS/OEIS for Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants

This letter transmits the Suquamish Tribe's comments concerning the Draft Environmental Impact Statement (DEIS) for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants.

Summary of Alternatives

There are three (3) Action Alternatives. Alternatives 1 and 2 partially dismantle the ship at East Coast facilities by removing areas of the ship outside of reactor compartments, leaving the propulsion space section intact. The propulsion space section, which contains the eight defueled reactor plants, would then be transported by heavy-lift ship around South America to Puget Sound Naval Shipyard (PSNS) and Intermediate Maintenance Facility (IMF) in Bremerton, Washington, for further dismantlement and disposal of the propulsion space. Following construction of a containment structure around the reactor compartments, enclosing them in packages, the reactor compartment packages would be transported by barge via the current program transport route to the Port of Benton barge slip on the west bank of the Columbia River at Richland, Washington. There, each package would then be loaded onto transporters and hauled to the DOE Hanford Site.

Alternatives 1 and 2 have the potential to impact the Suquamish Tribe's Treaty Rights.

Alternative 3 (the Navy "Preferred Alternative") would see all work completed in dismantlement facilities located on the Atlantic or Gulf Coast.

The Suquamish Tribe's Interest and Rights.

The Suquamish people have lived, fished, hunted, and gathered in and around Puget Sound since time immemorial. The Suquamish Tribe ("Tribe") is a federally-recognized Indian Tribe and pursuant to the 1855 Treaty of Point Elliott, the Tribe reserved the right to fish and gather shellfish at its "usual and accustomed" (U&A) fishing grounds and stations in Puget Sound among other reserved rights. The PSNS and IMF is within the Tribe's exclusive U&A. The Tribe has a strong historical and contemporary association with Sinclair Inlet that is significant and well documented. Ethnographic and archaeological evidence demonstrates that the Suquamish Tribe inhabited Sinclair Inlet and has utilized its natural resources (including fish and shellfish) for thousands of years.

Since time immemorial, the Tribe and its members have depended on access to healthy and abundant fishery resources in Sinclair Inlet and elsewhere in Puget Sound. These resources support the health, economic, cultural, and spiritual wellbeing of the Tribe and its members. When the abundance of these resources or access to them are threatened by water quality and sediment contamination, other pollution, habitat destruction and modification, water quality impairment, or numerous other avoidable and preventable anthropogenic pressures, the Tribe and each of its members are harmed.

Active Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) site

PSNS & IMF is an active CERCLA site with multiple Operating Units (OUs) and ongoing assessment and corrective actions in both the terrestrial and marine environments. Because Sinclair Inlet and adjacent waters are part of the Tribe's exclusive U&A, the Tribe is actively engaged as part of the CERCLA stakeholder and management team. Mercury, other metals, polychlorinated biphenyls (PCBs) and other contaminants of concern are or may be present in marine sediments at the site. Any activity which has the potential to disturb those sediments, impact cleanup efforts or otherwise negatively affect human health as a result of Navy activities requires public review, comment and input under CERCLA.

Review and Comments on Alternatives 1 and 2.

The DEIS states the "*Navy determined there would be no significant effects or major impacts on tribal resources and treaty rights resulting from the disposal of decommissioned, defueled naval reactor plants from ex-Enterprise (Navy & DOE, 2012).*" Such a statement is premature.

The Suquamish Tribe expressed concern for potential bottom scour during docking at PSNS & IMF, which could affect fish habitat. The DEIS states the Navy has:

> *"concluded that scour and propeller wash are not a concern at PSNS & IMF based on calculations of draft maximum, because the heavy-lift ship would unload the propulsion space section in deep water before entering Sinclair Inlet. The propulsion space section would have a smaller draft than current aircraft carriers and would be brought into port under tug."*

2.1

The Navy has not provided the scour analysis to the Tribe for its review. The Navy's response, however, presumes the propulsion section space will be unloaded prior to entering Sinclair Inlet. However, plans can change. Unless Sinclair Inlet is too shallow for the heavy-lift ship to enter, the Navy cannot unequivocally state the heavy-lift ship will not operate in Sinclair Inlet. Indeed, the DEIS tables showing calculated vessel travel distances by type of transport or towing vessel do not appear to have a separate travel distance for the tug that will tow the propulsion unit from where it is unloaded from the heavy-lift ship to PSNS.

The qualitative statement that "*The propulsion space section would have a smaller draft than current aircraft carriers and would be brought into port under tug*" should be replaced by a numerical statement indicating how much smaller the draft of the propulsion section would be compared to current aircraft carriers.

Additionally, the actions required to transfer the propulsion section from the heavy-lift ship to the tug should be defined in space and time. Without describing how long the transfer operation will take, the location, as the area required, including any security zone, it is premature for the Navy to suggest there will be no significant effects or major impacts on Suquamish's fishing access. Similarly, the distance of the security zone around the propulsion unit as it is under tow should be described. The size of the security zone and how long the propulsion unit takes to transit areas where Treaty fishing occurs will influence the impact. Similar concerns apply to the packages that would be towed under these Alternatives to Vancouver for transfer to a river tug. All vessel and tug traffic associated with this project within Puget Sound have the potential to interfere with the exercise of Treaty fishing. As some fisheries are constrained in time and space, even a small disruption of fishing activity can have considerable impact. Vessels can also damage fishing gear; however, the analysis of gear damage in the DEIS appears be restricted to that which might be caused by the Navy - *"the Navy uses standard navigational practices to avoid potential interactions with fixed gear."* This statement overlooks two issues: (1) some gear is not fixed, but drifts; and (2) the indirect impact of the proposed activity increasing non-navy vessel traffic. The movement of the propulsion unit through Puget Sound is a rare event and would draw spectators in boats of various sizes. But for this activity, an increased density of boats is highly likely in areas used by Suquamish to fish is an indirect impact with the potential to damage fishing gear. Operators of small boats are not as vigilant as Navy or commercial vessel operators in looking for fishing gear. This impact requires analysis. Damage to fishing gear can be severely detrimental to a fisher in terms of lost opportunity, time and gear replacement costs.

Alternative 3 (Preferred Alternative)

Alternative 3 is the Suquamish Tribe's preferred alternative because all activities would occur outside of Puget Sound and Washington State. This is the Navy's preferred alternative, and is the only alternative which will have no impact on Tribal resources and treaty rights.

Thank you for the opportunity to comment on this DEIS. The Tribe looks forward to working with the Navy to help the Navy better understand the Tribe's concerns. If you have any questions, please contact me directly via email (rmalcom@suquamish.nsn.us or phone at 360-394-8449.

Sincerely,

Rod Malcom
Biologist/Ecologist
Suquamish Tribe

Copy to: Captain Richard Massie, Commanding Officer, Naval Base Kitsap
Jenny Dellert, Archaeologist/Tribal Liaison, Naval Base Kitsap and Naval Magazine Indian Island
Frank Nichols, Environmental Director, Naval Base Kitsap and Naval Magazine Indian Island
Danielle Page-Pattison, Tribal Liaison, Navy Region Northwest
Chairman Leonard Forsman, Suquamish Tribe
Catherine Edwards, Executive Director, Suquamish Tribe
Rob Purser, Fisheries Director, Suquamish Tribe
Tom Ostrom, Ecosystem Recovery Manager, Suquamish Tribe
Alison O'Sullivan, Senior Biologist, Suquamish Tribe
Andrew Schmeising, Environmental Scientist, Suquamish Tribe.
Melody Allen, Attorney, Suquamish Tribe

C.2.3 State and Local Agencies

C.2.3.1 Texas Commission on Environmental Quality

#	Comment	Response
3.1	In accordance with the general conformity regulations in 40 CFR Part 93, this proposed action was reviewed for air quality impact. The proposed action may be partially located in Cameron, Hidalgo, and Willacy Counties, all of which are currently designated attainment/unclassified for the National Ambient Air Quality Standards (NAAQS) for all six criteria air pollutants. General conformity requirements do not apply for federal actions in Cameron; Hidalgo, or Willacy Counties. The proposed action may also impact Chambers, Fort Bend, and Harris Counties due to vehicle transit routes. These counties are designated nonattainment for the ozone NAAQS with a current classification of serious for the 2008 eight-hour ozone NAAQS and a current classification of marginal for the 2015 eight-hour ozone NAAQS. In addition, the United States Environmental Protection Agency (EPA) is expected to soon finalize actions under both ozone NAAQS that would reclassify the counties to severe and moderate, respectively. General conformity requirements apply for federal actions in Chambers, Fort Bend, and Harris Counties according to the higher, serious classification and will apply according to the severe classification once the EPA's final action is effective. Volatile organic compounds (VOC) and nitrogen oxides (NOX) are precursor pollutants that lead to the formation of ozone. A general conformity demonstration may be required when the total projected direct and indirect voc or NOX emissions from an applicable action are equal to or exceed the de minimis emissions level, which is 50 tons per year (tpy) for ozone NAAQS serious nonattainment areas and 25 tpy for ozone NAAQS severe nonattainment areas. Based on the information provided to the TCEQ, the emissions from the portion of this proposed action that may occur in Chambers, Fort Bend, and Harris Counties are expected	Section 3.6.3.3 (Texas), of the Final EIS/OEIS has been updated to include attainment/non-attainment information for listed counties. The conclusions presented in the Draft EIS/OEIS remain unchanged.

#	Comment	Response
	to be below the general conformity de minimis threshold and are not anticipated to impact the state implementation plan. We do not anticipate significant long term environmental impacts from this project as long as construction and waste disposal activities are completed in accordance with applicable local, state, and federal permits, statutes, and regulations. We agree with a finding of no significant impact and have no objection to the release of funds for this project. We recommend that the applicant take necessary steps to ensure that best management practices are used to control runoff from construction sites to prevent detrimental impact to surface and ground water.	

C.2.3.2 Virginia Department of Environmental Quality

#	Comment	Response
4.1	2(c) Recommendation. The Navy should take all reasonable precautions to limit emissions of VOCs and NOx, principally by controlling or limiting the burning of fossil fuels.	The Navy anticipates that release of volatile organic compounds and burning of fossil fuels during commercial dismantlement activities would be limited to the maximum extent practical through the implementation of Best Management Practices standard in the industry. The Navy would take reasonable steps to limit emissions of volatile organic compounds and nitrogen oxides by limiting the burning of fossil fuels and/or utilizing construction vehicles and equipment with clean burning engines, if feasible. In May 2022, the Navy announced its climate strategy, Climate Action 2030. This strategy set the Navy on a path to achieve the Nation's commitment to net-zero greenhouse gas emissions by 2050, while becoming a more capable, agile, and lethal fighting force.
4.2	3(b) Agency Findings. (i) Virginia Department of Conservation and Recreation DCR-DNH searched its Biotics Data System (Biotics) for occurrences of natural heritage resources from the project area in Hampton	The Navy consulted with federal regulatory agencies, the National Marine Fisheries Service (NMFS), and U.S. Fish and Wildlife Service, as appropriate in compliance with the Endangered Species Act (ESA) for Alternative 3 (Preferred Alternative). The Navy also consulted with NMFS in compliance with the Magnuson-Stevens Fishery Conservation and Management Act for the

#	Comment	Response
	Roads. According to the information currently in Biotics, natural heritage resources have not been documented within the project boundary including a 100-foot buffer. A predictive model identifying potential habitat for natural heritage resources intersects the project boundary. However, based on DCR's review of the proposed project a survey is not recommended for the resource. According to the information currently in DCR files, the James River, which has been designated by the Virginia Department of Wildlife Resources (DWR) as a Threatened and Endangered Species Water for the Atlantic sturgeon, is within the project area in Hampton Roads, including a 100-foot buffer. DCR-DNH finds that the proposed activities will not affect any documented state-listed plants or insects. There are no State Natural Area Preserves under DCR's jurisdiction in the vicinity of the project in Hampton Roads. (ii) Virginia Department of Health The VDH-DSS finds that project activities in Hampton Roads will not impact shellfish condemnation areas. 3(c) Recommendation. DCR recommends coordination with the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) and DWR, Virginia's regulatory authority for the management and protection of Atlantic sturgeon, to ensure compliance with protected species legislation.	Preferred Alternative. The Navy consulted with NMFS on federally listed species under the ESA, including Atlantic sturgeon, for the Preferred Alternative. While consultation with Virginia Department of Wildlife Resources (DWR) for state-listed species is not required for compliance with ESA and did not occur, analysis and protective measures included during the NMFS consultations for federally protected species would provide protections to state-listed species that co-occur within the Study Area. The Navy provided the Virginia DWR notice of availability for the Draft EIS/OEIS public comment period through notification letters. No comments were received by the Virginia DWR for this proposed action. Appendix D (Consultation Correspondence) of this EIS/OEIS contains the NMFS letter of concurrence for ESA consultation. Hull cleaning would only occur in the Hampton Roads Metropolitan Area, Virginia. Hull cleaning would only occur in water if dry dock hull cleaning was not practical. If the Navy determines that dry docking is not practical, the Navy would comply with all applicable laws for in-water hull cleaning (as specified in 40 CFR Part 1700 37[b][3][iv]), technical guidance on hull cleaning methods described in detail in the Naval Ships' Technical Manual Chapter 081 (Waterborne Underwater Hull Cleaning of Navy Ships), and site-specific agreements with National Marine Fisheries Service Office of Protected Resources (as specified in Appendix D [Consultation Correspondence] in the National Marine Fisheries Service letter of concurrence for Alternative 3 (Preferred Alternative). In addition, the Navy consulted with applicable state regulatory agencies in compliance with the Coastal Zone Management Act for the Preferred Alternative. For more detail on these consultations, see Chapter 5 (Other Considerations Required by NEPA) of this Final EIS/OEIS. Implementation of the Proposed Action and alternatives for this EIS/OEIS would comply with applicable federal, state, and local laws, regulations, and executive orders. The Navy consulted with regulatory agencies, as appropriate for Alternative 3 (Preferred Alternative), during the National Environmental Policy Act process to ensure that requirements are met.

#	Comment	Response
4.3	6(b) Agency Findings. The Navy determined the ex-ENTERPRISE (CVN 65) eligible for listing in the National Register of Historic Places (NRHP) as the nation's first nuclear powered aircraft carrier. The DHR concurs with this assessment. DHR also agrees that the preferred alternative will adversely affect the historic vessel by resulting in its destruction. However, DHR acknowledges that the existing Program Comment for the evaluation and treatment of NRHP-eligible vessels to resolve adverse effects between the Navy and the Advisory Council on Historic Preservation already establishes a process to address the adverse effect caused by this undertaking. DHR anticipates that the Navy will fulfill its responsibility under Section 106 of the National Historic Preservation Act, as amended, for this undertaking by implementing the provisions in the Program Comment.	Section 3.7.2.1 (Ex-Enterprise [CVN-65]) in this EIS/OEIS describes the Navy's implementation of the Advisory Council on Historic Preservation's Program Comment for the Department of the Navy for the Disposition of Historic Vessels for this undertaking. Upon designating final disposition, the Navy will deposit the required materials with the National Archives and Records Administration, fulfilling the remaining requirements of the Program Comment, and thereby satisfying Navy's responsibilities under Section 106 of the National Historic Preservation Act to take into account the effect of the Proposed Action on the National Register of Historic Places-eligible ex-Enterprise.
4.4	1. Coastal Zone Management Act Federal Consistency. Pursuant to the Coastal Zone Management Act of 1972, as amended, the Navy is required to determine the consistency of its activities affecting Virginia's coastal resources or coastal uses with the Virginia Coastal Zone Management (CZM) Program (see section 307(c)(1) of the Act and 15 CFR Part 930, sub-part C, section 930.34). This involves an analysis of the activities in light of the Enforceable Policies of the Virginia CZM Program, and submission of a consistency determination reflecting that analysis and committing the Navy to comply with the Enforceable Policies. The Navy is also encouraged to consider the effect of the proposal on the Advisory Policies of the Virginia CZM Program. This determination may be provided as part of the documentation concluding the NEPA process, or independently, depending on the agency's preference. Section 930.39 gives content requirements for the consistency determination, or you may visit the DEQ Federal Consistency website.	In compliance with the Coastal Zone Management Act, the Navy prepared and submitted a General Negative Determination for Towing of Inactive Navy Ships to the Virginia Department of Environmental Quality for review. The Virginia Department of Environmental Quality provided concurrence with the Navy's General Negative Determination for Towing of Inactive Navy Ships on November 22, 2022 (see Appendix D [Consultation Correspondence]).

#	Comment	Response
4.5	Air Compliance Program: The following air regulations may be applicable: Virginia Administrative Code 9 VAC 5- 50-60 et seq. which addresses the abatement of visible emissions and fugitive dust emissions, and Virginia Administrative Code 9 VAC 5-130-10 et seq. which addresses open burning.	A commercial vendor would be subject to all applicable local, state, and federal environmental and radiation protection requirements during dismantlement of ex-Enterprise. The Navy would enforce compliance with these requirements via the contract and have on-site personnel observing the work for contract compliance.
4.6	Land Program (Solid and Hazardous Waste): All construction and demolition waste, including any excess soil, must be characterized in accordance with the Virginia Hazardous Waste Management Regulations and disposed of at an appropriate facility as applicable. For additional information, contact Melinda Woodruff, DEQ-TRO at melinda.woodruff@deq.virginia.gov . Stormwater: No comment as proposed scope of work does not include land disturbing activities. Virginia Water Protection Permit Program (VWPP): Potential adverse impacts to water quality and wetlands resulting from surface runoff due to the proposed activities must be minimized. This can be achieved by using Best Management Practices (BMPs). Permanent or temporary impacts to surface waters and wetlands may require DEQ authorization under §401 of the Clean Water Act, Virginia Code §62.1- 44.15:20, and Virginia Administrative Code 9 VAC 25-210-10 et seq. Provided that any and all necessary permits are obtained and complied with, the project will be consistent with DEQ program requirements.	The Navy and its contractors would comply with all applicable local, state, and federal requirements, including, for contractors in Virginia, applicable requirements of the Virginia Hazardous Waste Management Regulations as well as the Virginia Water Protection Permit Program. The Navy would enforce compliance with these requirements via the contract and have on-site personnel observing the work for contract compliance. The Navy would reach out/coordinate with appropriate state agencies following ultimate decision regarding commercial dismantlement. Any waste disposed in the state of Virginia would be characterized in accordance with the Virginia Hazardous Waste Management Regulations and disposed of at an appropriate facility as applicable.

#	Comment	Response
4.7	Water Permit Program (VPDES): No comments as there does not appear to be any point source discharges of process water or wastewater associated with this project that would necessitate a VPDES permit. Petroleum Storage Tank Program: DEQ records indicate there may be petroleum releases along the proposed project footprint. If evidence of a petroleum release is discovered during implementation of this project, it must be reported to DEQ, as authorized by CODE # 62.1-44.34.8 through 19 and 9 VAC 25-580- 10 et seq. Contact Ms. Melinda Woodruff at (757)407-2516. Petroleum-contaminated soils and ground water generated during implementation of this project must be properly characterized and disposed of properly. Installation and operation of any regulated petroleum storage tank(s) either AST or UST must also be conducted in accordance with the Virginia Regulations 9 VAC 25-91-10 et seq and / or 9 VAC 25-580-10 et seq.	The Navy and its contractors would comply with all applicable local, state, and federal requirements, including, for contractors in Virginia, applicable requirements pertaining to petroleum releases and regulated petroleum storage tank(s). The Navy would enforce compliance with these requirements via the contract and have on-site personnel observing the work for contract compliance.
4.8	The Navy determined the ex-ENTERPRISE (CVN 65) eligible for listing in the National Register of Historic Places (NRHP) as the nation's first nuclear-powered aircraft carrier. The DHR concurs with this assessment. We also agree that the preferred alternative will adversely affect the historic vessel by resulting in its destruction. However, DHR acknowledges that the existing Program Comment for the evaluation and treatment of NRHP-eligible vessels to resolve adverse effects between the Navy and the Advisory Council on Historic Preservation already establishes a process to address the adverse effect caused by this undertaking. We anticipate that the Navy will fulfill its responsibility under Section 106 of the National	See response to Item #4.3.

#	Comment	Response
	Historic Preservation Act, as amended, for this undertaking by implementing the provisions in the Program Comment.	
4.9	New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.	Implementation of the Proposed Action and alternatives for this EIS/OEIS would comply with applicable federal, state, and local laws, regulations, and executive orders. The Navy confirmed the information in Biotics remains current as of March 2023. The Navy has consulted with regulatory agencies, as appropriate, during the National Environmental Policy Act process and prior to implementation of the Proposed Action and alternatives to ensure that requirements are met. This would include an update to the natural heritage information if the scope of the project were to be modified.
4.10	COMMENTS SPECIFIC TO THE PROJECT All precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx).	A commercial vendor would be subject to all applicable local, state, and federal environmental and radiation protection requirements during dismantlement of ex-Enterprise. The Navy would enforce compliance with these requirements via the contract and have on-site personnel observing the work for contract compliance. See response to Item #4.1.

C.2.3.3 State of Washington, Department of Ecology

#	Comment	Response
5.1	The NWP endorses the EIS/OEIS Preferred Alternative (#3), commercial dismantlement than disposal at a commercial Low-Level Radioactive Waste site. If the Navy does not select Alternative #3, NWP prefers Alternative #1 over Alternative #2, because of the greater environmental impacts of Alternative #2 compared to Alternative #1.	Commenter preference acknowledged.
5.2	1. Pg. 3.4-3, Figure 3.4-2: Washington Region of Influence – The DOE Hanford Site. The legend shown as DOE Hanford Site is not correct. It appears that the legend shows Hanford's 200 Area where Trench 94 is located.	The error has been corrected in the Final EIS/OEIS.

#	Comment	Response
5.3	2. Draft EIS/OEIS evaluates potential impacts on socioeconomic and environmental justice conditions from the proposed action and no action alternatives (Section 3.4, Socioeconomics and Environmental Justice). The analysis is based on identifying low income population, minority population, and races in the affected areas. Ecology believes that this analysis should also identify populations in the affected areas who may have barriers to engagement or access to information. Those populations could be identified based on education level and those who speak English "less than very well". See Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency. Ecology suggests further evaluation using EPA's EJSCREEN.	The Navy is committed to facilitating public, stakeholder, and tribal input and dialogue to ensure a complete environmental analysis and informed decision making. Populations in affected areas were identified in Section 3.4 (Socioeconomics and Environmental Justice). Executive Order 13166 ensures that federal agency programs and activities are accessible to individuals with limited English proficiency. The Navy provided opportunities for community participation for limited English proficiency communities or individuals during the National Environmental Policy Act process by translating outreach materials and providing an interpreter at public meetings. Display advertisements of the notice of availability of the Draft EIS/OEIS and notice for the virtual public meetings were placed in 13 local and regional newspapers, including five Spanish-language publications, in selected areas of Washington state, Oregon, Virginia, Texas, and Alabama. A Spanish version of the advertisement was published in Spanish-language newspapers. A Spanish-language interpreter was available at each virtual public meeting to assist the public with interpretation services during the question-and-answer session. A public briefing presentation was also prepared to brief the public during the virtual public meetings presentation portion. The brief and prepared remarks were translated into Spanish to aid Spanish-language speakers in following along and made available for download on the project website (https://www.carrierdisposaleis.com). Additionally, the following materials were translated into Spanish and made publicly available on the project website: website content, public notifications (Federal Register Notice of Availability and Notice of Virtual Public Meetings, newspaper advertisement, press release, and postcard notification), and project information (factsheet and project posters). Comprehensive information on the public participation efforts can be viewed in Appendix B (Public Involvement and Distribution) of this EIS/OEIS. The communities identified within the affected areas predominantly spoke either English or Spanish. The Navy has considered Executive Order 13166, *Improving Access to Services for Persons with Limited English Proficiency*, and determined this Executive Order is not applicable for further analysis in this EIS/OEIS as the Navy is not providing any federal funds or services to the public as part of this EIS/OEIS.

#	Comment	Response
		The Navy competitive bidding process would occur following completion of this EIS/OEIS. Regulations that would be applicable in the Navy contracting process would be considered, as appropriate, at that time. Regarding EPA's EJSCREEN, see response to Item #1.9.
5.4	3. Section 3.4 in the Draft EIS/OEIS evaluates potential impacts on environmental justice conditions per Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994) and Title VI of the Civil Rights Act of 1964. Ecology suggests adding the following regulations and Executive Orders to the analysis for potential impacts on environmental justice in the EIS/OEIS. a. Title IX of the Education Amendments of 1972 b. Section 504 of the Rehabilitation Act of 1973 c. Age Discrimination Act of 1975 d. Federal Water Pollution Control Act Amendments of 1972 e. Executive Order 14008, Tackling the Climate Crisis at Home and Abroad f. Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency g. Executive Order 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis h. Executive Order 13985, Advancing Racial Equity and Support for Underserved i. Communities Through the Federal Government	The Navy has reviewed and considered the suggested regulations and executive orders for inclusion in the Final EIS/OEIS Section 3.4 (Environmental Justice and Socioeconomics) analysis. Any contract the Navy awards with an authorized commercial dismantlement facility would be in accordance with all applicable executive orders, federal laws and regulations, and Navy policies. This EIS/OEIS does not select a dismantlement facility or location. The final commercial location for dismantlement would be determined through a competitive bidding process following completion of this EIS/OEIS. Regulations that would be applicable in the Navy contracting process would be considered and included as appropriate at that time. The suggested regulations of Title IX of the Education Amendments of 1972; Section 504 of the Rehabilitation Act of 1973; Age Discrimination Act of 1975; and Executive Order 13985, *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*, are not applicable to the analysis in Section 3.4 (Socioeconomics and Environmental Justice) as these are related to employment and contracting requirements not included in this EIS/OEIS. The Clean Water Act (33 United States Code Section 1251 et seq.) is included in Section 1.7 (Relevant Laws, Regulations, and Policies) and Table 5-1 (Principal Federal and State Laws, Regulations, Executive Orders, and Policies Applicable to the Proposed Action and Alternatives) of this EIS/OEIS. The Navy has further included analysis in Section 3.4.3.2.1 (Tow ex-Enterprise from Newport News, Virginia, to Commercial Dismantlement Facility) and Section 3.4.3.3.5 (Port of Benton Barge Slip Modifications) regarding water quality impacts in relation to environmental justice for in-water hull cleaning and Port of Benton barge slip modification activities of the Proposed Action. As discussed in Section 3.5 (Biological Resources) water quality impacts in relation to in-water hull cleaning in the Hampton Roads Metropolitan Area,

#	Comment	Response
		Virginia, and the Port of Benton barge slip modification activities have the potential to have some impacts but are reduced through project designs, implementation of current or proposed management practices, and mitigation. The Navy concluded that water quality impacts from the Proposed Action were considered to be minimal with the implementation of project design and implementation of best management practices associated with these activities. Section 1.5 (Scope of Environmental Analysis) further identifies that several key documents for dismantlement and disposal of nuclear-powered ships have identified minimal impacts on water quality given compliance with applicable federal, state, and local environmental laws and regulations. Therefore, there would be no disproportionate environmental impacts on environmental justice populations in relation to water quality. The Navy has considered Executive Order 13166, *Improving Access to Services for Persons with Limited English Proficiency*, and determined this Executive Order is not applicable for further analysis in this EIS/OEIS as the Navy is not providing any federal funds or services to the public as part of this EIS/OEIS. The Navy competitive bidding process would occur following completion of this EIS/OEIS. Regulations that would be applicable in the Navy contracting process would be considered as appropriate at that time. Regardless, the Navy did incorporate measures to accommodate Spanish-language speakers for public participation in the Draft EIS/OEIS public comment period, as discussed under the Item #10.3 response. Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, has been incorporated into the Final EIS/OEIS and is reflected in Section 1.7 (Relevant Laws, Regulations, and Policies), Table 5-1 (Principal Federal and State Laws, Regulations, Executive Orders, and Policies Applicable to the Proposed Action and Alternatives), and Section 3.4.1.2 (Regulatory Framework). Executive Order 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, was considered and included in this EIS/OEIS under Section 1.7 (Relevant Laws, Regulations, and Policies) and

#	Comment	Response
		Table 5-1 (Principal Federal and State Laws, Regulations, Executive Orders, and Policies Applicable to the Proposed Action and Alternatives).
5.5	4. There are 29 federally recognized tribes in Washington State. Among those, 15 are recognized as "Pacific Northwest tribes have traditional resources or treaty rights considered in the Pacific Northwest ROI" for the analysis of American Indian Tribal Resources and Treaty Rights (Section 3.3.2). According to Table B-1, 19 of them received the scoping notification letters. Ecology suggests including, at a minimum, The Confederated Tribes of the Chehalis Reservation and the Squaxin Island Tribe.	The Confederated Tribes of the Chehalis Reservation is identified in Section 3.3.2 (Affected Environment) as having tribal rights in the region of influence. As such, the Confederated Tribes of the Chehalis Reservation was included in the outreach for the Draft EIS/OEIS and will also receive notification for the Final EIS/OEIS. The Squaxin Island Tribes Usual and Accustomed fishing grounds and stations are outside of the region of influence and therefore are not included. Appendix B (Public Involvement and Distribution) has been updated in the Final EIS/OEIS to include tribes included in notifications for the Draft EIS/OEIS.

C.2.3.4 Alabama Historical Commission

#	Comment	Response
6.1	Upon review of the materials associated with the above referenced Environmental Impact Statement, we find that only Alternative 3 relates to resources located within the State of Alabama. If this Alternative is selected, with the stipulation that no new infrastructure will be required, we agree that any effects to historic properties under this Alternative would likely be temporary in nature. Therefore, we agree with the determination of no adverse effect to historic properties. Consultation with the State Historic Preservation Office does not constitute consultation with Tribal Historic Preservation Offices, other Native American tribes, local governments, or the public.	A Section 106 review of the Proposed Action and alternatives indicates Alternative 3 (Preferred Alternative) does not involve activities that have the potential to affect historic properties. If an action alternative other than the preferred alternative is selected, additional consultation will be required under Section 106 of the National Historic Preservation Act. Additionally, while the specific facility for commercial dismantlement has not been identified, Mobile, Alabama, has commercial facilities with the capability to dismantle a ship of this size, and therefore, the Navy would not require new permanent facilities or facility improvements to complete the project.

C.2.3.5 Texas Historical Commission

#	Comment	Response
7.1	The History Programs Division review staff, led by Caitlin Brashear, concurs that the Ex-Enterprise, the first nuclear-powered aircraft carrier in the world, is Eligible for Listing in the National Register of Historic Places (NRHP). Additionally, regarding the Texas Cultural Resources Study Area, it should be noted that the Port of Brownsville was previously determined eligible for listing in the NRHP. The Division of Architecture Review Staff, led by Alexander Shane, cannot make an accurate determination of effect at this time based on the project information. Our staff requests a supplementary submission of additional information explaining how the Navy met their proposed treatment steps in program comment entitled, "Program Comment Pursuant to 36 C.F.R. § 800.14(e) Implementing Section 106 of the National Historic Preservation Act for the Evaluation of Vessels for Eligibility for Listing in the National Register of Historic Places and the Treatment of Eligible Vessels to Resolve Adverse Effects that May Result from Certain Methods of Final Disposition" including, an itemized documentation package list of historically significant records transferred to NARA, a history of the vessel in the Dictionary of American Naval Fighting Ships, a list of items removed from the ship procured by the Navy Curator and eligible non-profit organizations, a Booklet of General Plans, and the last report of Board of Inspection and Survey describing the material condition of the vessel.	After receiving the above comment, the Navy contacted the Texas Historical Commission and was informed that the Port of Brownsville, also known as the Brownsville Ship Channel, was recommended eligible for listing in the National Register of Historic Places in 2013. The historic district includes the ship channel and its associated buildings, roads, and railroads. The Port of Brownsville, which was constructed to connect Brownsville to the Gulf of Mexico, is significant at the local and state level under Criterion A in the area of Commerce for its role in developing and expanding the economy of the Lower Rio Grande Valley with a period of significance that extends from the time of its construction in 1936 to the 1980s. Section 3.7.2.4.2 (Cultural Resources Within the Study Area) in the EIS/OEIS was revised to include the presence of the Port of Brownsville within the study area for Cultural Resources. A Section 106 review of the Proposed Action and alternatives indicates that Alternative 3 (Preferred Alternative) does not involve activities that have the potential to affect historic properties. If an action alternative other than the Preferred Alternative is selected, additional consultation will be required under Section 106 of the National Historic Preservation Act. Additionally, while the specific facility for commercial dismantlement has not been identified, the current commercial dismantlement facilities within the Brownsville, Texas, study area are capable of ship dismantlement work, and no commercial facility would need permanent infrastructure to accommodate the ex-Enterprise dismantlement. The continued dialogue with the Texas Historical Commission also addressed the Navy's implementation of the Advisory Council on Historic Preservation's Program Comment for the Department of the Navy for the Disposition of Historic Vessels specific to this undertaking, with the Texas Historical Commission concurring that no further consultation is necessary.

C.2.3.6 Commonwealth of Virginia, Department of Historic Resources

#	Comment	Response
8.1	The Navy determined the ex-ENTERPRISE (CVN 65) eligible for listing in the National Register of Historic Places (NRHP) as the nation's first nuclear-powered aircraft carrier. The OHR concur with this assessment. We also agree that the preferred alternative will adversely affect the historic vessel by resulting in its destruction. However, DHR acknowledges that the existing Program Comment for evaluation and treatment of NRHP-eligible vessels to resolve adverse effects between the Navy and the Advisory Council on Historic Preservation already establishes a process to address the adverse effect caused by this undertaking. We anticipate that the Navy will fulfill its responsibility under Section 106 of the National Historic Preservation Act, as amended, for this undertaking by implementing the provisions in the Program Comment.	See response to Item #4.3.

Comment Document #3

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 20, 2022

Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Via: Mail

Re: **TCEQ NEPA Request #2022-158. Disposal of Decommissioned, Defueled Ex-Enterprise *(CVN 65)* and its associated Naval Reactor Plants. Cameron County.**

To Whom It May Concern,

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above-referenced project and offers the following comments:

In accordance with the general conformity regulations in 40 CFR Part 93, this proposed action was reviewed for air quality impact. The proposed action may be partially located in Cameron, Hidalgo, and Willacy Counties, all of which are currently designated attainment/unclassified for the National Ambient Air Quality Standards (NAAQS) for all six criteria air pollutants. General conformity requirements do not apply for federal actions in Cameron, Hidalgo, or Willacy Counties.

The proposed action may also impact Chambers, Fort Bend, and Harris Counties due to vehicle transit routes. These counties are designated nonattainment for the ozone NAAQS with a current classification of serious for the 2008 eight-hour ozone NAAQS and a current classification of marginal for the 2015 eight-hour ozone NAAQS. In addition, the United States Environmental Protection Agency (EPA) is expected to soon finalize actions under both ozone NAAQS that would reclassify the counties to severe and moderate, respectively. General conformity requirements apply for federal actions in Chambers, Fort Bend, and Harris Counties according to the higher, serious classification and will apply according to the severe classification once the EPA's final action is effective.

3.1

Volatile organic compounds (VOC) and nitrogen oxides (NOX) are precursor pollutants that lead to the formation of ozone. A general conformity demonstration may be required when the total projected direct and indirect VOC or NOX emissions from an applicable action are equal to or exceed the de minimis emissions level, which is 50 tons per year (tpy) for ozone NAAQS serious nonattainment areas and 25 tpy for ozone NAAQS severe nonattainment areas. Based on the information provided to the TCEQ, the emissions from the portion of this proposed action that may occur in Chambers, Fort Bend, and Harris Counties are expected to be below the general conformity de minimis threshold and are not anticipated to impact the state implementation plan.

We do not anticipate significant long term environmental impacts from this project as long as construction and waste disposal activities are completed in accordance with applicable local, state, and federal permits, statutes, and regulations. We agree with a finding of no significant impact and have no objection to the release of funds for this project. We recommend that the applicant take necessary steps to ensure that best management practices are used to control runoff from construction sites to prevent detrimental impact to surface and ground water.

The management of industrial and hazardous waste at the site including waste treatment, processing, storage and/or disposal is subject to state and federal regulations. Construction and Demolition waste must be sent for recycling or disposal at a facility authorized by the TCEQ. Special waste authorization may be required for the disposal of asbestos containing material.

Thank you for the opportunity to review this project. If you have any questions, please contact the agency NEPA coordinator at (512) 239-2619 or NEPA@tceq.texas.gov

Sincerely,

Ryan Vise,
Division Director
External Relations

Comment Document #4

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Travis A. Voyles
Acting Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
(804) 698-4020

September 28, 2022

Office of Congressional and Public Affairs
Attn: Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Avenue, Stop 2072
Bremerton, Washington 98314-2072
Via Navy Project Website: www.carrierdisposaleis.com

RE: Draft Environmental Impact Statement/Overseas Environmental Impact Statement for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants, Department of the Navy (DEQ 22-137F).

Dear Sir or Madam:

The Commonwealth of Virginia has completed its review of the August 2022 Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS) for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants. The Department of Environmental Quality (DEQ) Office of Environmental Impact Review (OEIR) received a Notice of Availability for the DEIS/OEIS on August 23, 2022. DEQ-OEIR is responsible for coordinating Virginia's review of federal environmental documents and responding to appropriate federal officials on behalf of the Commonwealth. DEQ-OEIR is also responsible for coordinating Virginia's review of federal consistency determinations (FCDs) submitted pursuant to the Coastal Zone Management Act (CZMA) and providing the state's response. The following agencies participated in the review of the DEIS/OEIS for the proposal:

Department of Environmental Quality
Department of Conservation and Recreation
Department of Health
Department of Historic Resources

In addition, the Department of Wildlife Resources, Virginia Marine Resources Commission, Hampton Roads Planning District Commission, and City of Newport News were invited to comment on the proposed action.

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants
DEIS/OEIS, DEQ 22-137F

PROJECT DESCRIPTION

The Department of the Navy (Navy), with U.S. Department of Energy (DOE) as a cooperating agency, has prepared a DEIS/OEIS to evaluate the potential environmental impacts associated with alternatives for the disposal of the decommissioned, defueled ex-Enterprise (CVN 65) aircraft carrier, including its naval reactor plants. USS Enterprise was constructed with eight naval reactor plants housed in rugged compartments inside the ship. As part of the decommissioning process, the nuclear fuel has been removed from the ship's eight reactor plants. Ex-Enterprise is currently being stored pier-side at Newport News Shipbuilding in Newport News, Virginia.

The Proposed Action is to dispose of ex-Enterprise, including its defueled reactor plants. The Proposed Action would entail dismantling and recycling the non-radioactive remnant hull sections of ex-Enterprise at a government or authorized commercial facility in accordance with applicable federal, state, and local laws, and removing and packaging of ex-Enterprise reactor plant components for transportation and disposal as low-level radioactive waste to authorized radioactive waste disposal facilities.

The purpose of the Proposed Action is to reduce Navy inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and to dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy. Dismantling is the only method approved for the disposition of nuclear-powered ships stricken from the Naval Vessel Register and is required to be accomplished in the United States or its territories in accordance with the statutory responsibilities of the Naval Nuclear Propulsion Program.

The Navy has identified new disposal alternatives that may be more cost-effective and better utilize available resources within Navy public shipyards. The DEIS/OEIS includes an evaluation of the following alternatives:

- Alternative 1 - Single Reactor Compartment Packages: This alternative involves the partial dismantlement and removal of non-radiological portions of ex-Enterprise at a commercial dismantlement facility. The remainder, including the defueled reactor plants, would be transported by heavy-lift ship to Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) for recycling, construction of eight single reactor compartment packages, and shipment by barge to the Port of Benton near the DOE Hanford Site, and via a multiple-wheel, high-capacity transporter to the DOE Hanford Site for disposal.
- Alternative 2 - Dual Reactor Compartment Packages: This alternative is the same as Alternative 1, except four dual reactor compartment packages would be constructed rather than eight single reactor compartment packages. The packages would be heavier and larger than reactor compartment packages

currently transported to the DOE Hanford Site under the existing Navy program.

- Alternative 3 - Commercial Dismantlement: Under this alternative, the Navy would contract with commercial industry to dismantle ex-Enterprise, including its defueled reactor plants, and dispose of the reactor plant components via several hundred shipments to authorized waste disposal sites. The Navy is evaluating three locations for commercial dismantlement: the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; and Mobile, Alabama.

The Navy also evaluated the No Action Alternative, which involves waterborne storage of ex-Enterprise and periodic maintenance to ensure that storage continues in a safe and environmentally responsible manner.

The Navy has identified Alternative 3 as its preferred alternative because it will keep the specially qualified and trained PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivation and reactor compartment package work that are already part of the PSNS & IMF workload, will provide cost benefits to the U.S. taxpayer, and will not result in significant environmental impacts. The preferred alternative will not result in any decrease in workforce at PSNS & IMF.

CONCLUSION

Based on the information provided in the DEIS/OEIS and comments from reviewers, the Commonwealth of Virginia has no objection to the proposal as presented, provided the Navy complies with all applicable laws and regulations. Provided activities are performed in accordance with the recommendations which follow, this project is unlikely to have significant effects on ambient air quality, water quality, and wetland resources of the Commonwealth.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Water Quality and Wetlands. The DEIS/OEIS (page 3.5-69) states that under Alternative 3 (Preferred Alternative), in-water hull cleaning would only occur at Hampton Roads Metropolitan Area if ex-Enterprise was towed to the Port of Mobile or Port of Brownsville. Although in-water hull cleaning can impact levels of dissolved oxygen, turbidity, nitrate, organic debris and dissolved metals in the water column, monitoring studies have shown these conditions to be temporary, decreasing rapidly to ambient concentrations after cessation of the cleaning activity (NMFS, 2019). The DEIS/OEIS did not indicate that wetlands in Virginia would be impacted.

1(a) Agency Jurisdiction. The State Water Control Board promulgates Virginia's water regulations covering a variety of permits to include the Virginia Pollutant Discharge Elimination System Permit regulating point source discharges to surface waters, Virginia Pollution Abatement Permit regulating sewage sludge, storage and land application of

biosolids, industrial wastes (sludge and wastewater), municipal wastewater, and animal wastes, the Surface and Groundwater Withdrawal Permit, and the Virginia Water Protection (VWP) Permit regulating impacts to streams, wetlands, and other surface waters. The VWP permit is a state permit which governs wetlands, surface water, and surface water withdrawals and impoundments. It also serves as §401 certification of the federal Clean Water Act §404 permits for dredge and fill activities in waters of the U.S. The VWP Permit Program is under the Office of Wetlands and Stream Protection, within the DEQ Division of Water Permitting. In addition to central office staff that review and issue VWP permits for transportation and water withdrawal projects, the six DEQ regional offices perform permit application reviews and issue permits for the covered activities:

- Clean Water Act, §401;
- Section 404(b)(i) Guidelines Mitigation Memorandum of Agreement (2/90);
- State Water Control Law, Virginia Code section 62.1-44.15:20 *et seq.*; and
- State Water Control *Regulations*, 9 VAC 25-210-10.

1(b) Agency Findings.

(i) Virginia Water Protection Permit

The VWP Permit program at the DEQ Tidewater Regional Office (TRO) did not indicate that surface waters and wetlands under its jurisdiction would be impacted by the proposal.

(ii) Virginia Pollutant Discharge Elimination System

The VPDES program at DEQ-TRO finds that there does not appear to be any point source discharges of process water or wastewater associated with the proposal that would necessitate a VPDES permit.

For additional information regarding these comments, contact the VWP Permit program at DEQ-TRO, Jeff Hannah at (757) 518-2166 or jeffrey.hannah@deq.virginia.gov or the VPDES program at DEQ-TRO, Janet Weyland at (757) 518-2151 or janet.weyland@deq.virginia.gov.

2. Air Quality. According to the DEIS/OEIS (page 3.6-28), Alternative 3 (Preferred Alternative) does not require federal construction activities, thus construction-related air emissions would not occur under Alternative 3. Ship recycling activities can generate air pollutants that are regulated by the Clean Air Act (CAA). If a ship recycling facility emits regulated amounts of air pollutants, it must obtain the appropriate operating or preconstruction permit and comply with all emissions requirements set forth in that permit. It is anticipated that dismantlement emissions would be covered under an

existing stationary source permit issued through the New Source Review permitting process and, as such, would be exempt from being considered a direct or indirect emission under General Conformity Applicability Analysis (DEIS/OEIS, page 3.6-2p).

2(a) Agency Jurisdiction. The DEQ Air Division, on behalf of the State Air Pollution Control Board, is responsible for developing regulations that implement Virginia's Air Pollution Control Law (Virginia Code §10.1-1300 *et seq.*). DEQ is charged with carrying out mandates of the state law and related regulations as well as Virginia's federal obligations under the Clean Air Act as amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate DEQ regional office is directly responsible for the issuance of necessary permits to construct and operate all stationary sources in the region as well as monitoring emissions from these sources for compliance. As a part of this mandate, EIRs of projects to be undertaken in the state are also reviewed. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

The Air Division regulates emissions of air pollutants from industries and facilities and implements programs designed to ensure that Virginia meets national air quality standards. The most common regulations associated with major State projects are:

- Open burning: 9 VAC 5-130 *et seq.*
- Fugitive dust control: 9 VAC 5-50-60 *et seq.*
- Permits for fuel-burning equipment: 9 VAC 5-80-1100 *et seq.*

2(b) Agency Findings. According to the DEQ Air Division, Hampton Roads is in attainment for ozone (O_3) and emission control area for volatile organic compounds (VOCs) and nitrogen oxides (NO_x).

4.1 **2(c) Recommendation.** The Navy should take all reasonable precautions to limit emissions of VOCs and NO_x, principally by controlling or limiting the burning of fossil fuels.

For further information, contact the DEQ Air Division, Kotur Narasimhan at (804) 519-6447 or kotur.narasimhan@deq.virginia.gov.

3. Biological Resources. The DEIS/OEIS (page 3.5-69) states that the Navy has determined that initial transport of ex-Enterprise from Newport News, Virginia to a commercial dismantlement facility would have minimal impacts on biological resources. In-water hull cleaning may affect Endangered Species Act (ESA)-listed Atlantic

sturgeon, green sea turtle, Kemp's ridley sea turtle, and leatherback sea turtle. In-water hull cleaning may affect Atlantic sturgeon critical habitat where that cleaning would occur in the waters of Hampton Roads Metropolitan Area, Virginia. Ship and tow line strike and ship noise may affect the shortnose sturgeon, Atlantic sturgeon, Gulf sturgeon, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, hawksbill sea turtle, loggerhead sea turtle, and West Indian manatee. Hull cleaning activities may adversely affect water and substrate quality and biogenic habitats that serve as Essential Fish Habitat (EFH) and HAPC. However, these impacts are expected to be very minor in severity, short term in duration, and limited in spatial extent. According to the DEIS/OEIS (page 3.5-70), ship dismantlement would occur at highly industrialized locations, with baseline noise conditions elevated well above typical background levels. Therefore, it is unlikely that dismantlement activities associated with the Proposed Action would greatly increase underwater noise levels above baseline levels at these high traffic, industrialized ports. Based on the requirements for environmental compliance related to the shipbreaking process described above, and the low anticipated density of ESA-listed species in the immediate vicinity of these activities, NMFS made a determination in the 2019 Programmatic Biological Opinion that the potential for effects to ESA-listed species and critical habitats associated with commercial ship breaking (or dismantling) activities is extremely unlikely to occur and thus would be discountable.

3(a) Agency Jurisdictions.

(i) Virginia Department of Conservation and Recreation (DCR) Division of Natural Heritage (DNH)

Department of Conservation and Recreation's (DCR) Division of Natural Heritage (DNH)'s mission is conserving Virginia's biodiversity through inventory, protection and stewardship. The Virginia Natural Area Preserves Act (Virginia Code §10.1-209 through 217), authorizes DCR to maintain a statewide database for conservation planning and project review, protect land for the conservation of biodiversity, and protect and ecologically manage the natural heritage resources of Virginia (the habitats of rare, threatened and endangered species, significant natural communities, geologic sites, and other natural features). Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

(ii) Virginia Department of Health

The Virginia Department of Health's (VDH) Division of Shellfish Sanitation (DSS) is responsible for protecting the health of the consumers of molluscan shellfish and crustacea by ensuring that shellfish growing waters are properly classified for

harvesting, and that molluscan shellfish and crustacea processing facilities meet sanitation standards. The mission of this Division is to minimize the risk of disease from molluscan shellfish and crustacea products at the wholesale level by classifying shellfish waters for safe commercial and recreational harvest; by implementing a statewide regulatory inspection program for commercial processors and shippers; and by providing technical guidance and assistance to the shellfish and crustacea industries regarding technical and public health issues.

3(b) Agency Findings.

(i) Virginia Department of Conservation and Recreation

DCR-DNH searched its Biotics Data System (Biotics) for occurrences of natural heritage resources from the project area in Hampton Roads. According to the information currently in Biotics, natural heritage resources have not been documented within the project boundary including a 100-foot buffer. A predictive model identifying potential habitat for natural heritage resources intersects the project boundary. However, based on DCR's review of the proposed project a survey is not recommended for the resource.

According to the information currently in DCR files, the James River, which has been designated by the Virginia Department of Wildlife Resources (DWR) as a Threatened and Endangered Species Water for the Atlantic sturgeon, is within the project area in Hampton Roads, including a 100-foot buffer.

4.2 DCR-DNH finds that the proposed activities will not affect any documented state-listed plants or insects. There are no State Natural Area Preserves under DCR's jurisdiction in the vicinity of the project in Hampton Roads.

(ii) Virginia Department of Health

The VDH-DSS finds that project activities in Hampton Roads will not impact shellfish condemnation areas.

3(c) Recommendation. DCR recommends coordination with the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) and DWR, Virginia's regulatory authority for the management and protection of Atlantic sturgeon, to ensure compliance with protected species legislation.

For additional information, contact DCR, Allison Tillett at (757) 247-2255 or allison.tillett@dcr.virginia.gov or VDH-DSS, Adam Wood at (804) 839-2809 or adam.wood@vdh.virginia.gov.

4. Public Water Supply. According to the DEIS/OEIS (page 1-6), resources considered

but not carried forward for full analysis included water resources. The Proposed Action and alternatives would be conducted similar to activities that have occurred in the past with little to no water or geological impacts.

4(a) Agency Jurisdiction. The Virginia Department of Health (VDH) Office of Drinking Water (ODW) reviews projects for the potential to impact public drinking water sources (groundwater wells, springs and surface water intakes). VDH administers both federal and state laws governing waterworks operation.

4(b) Agency Findings. VDH finds that there are no public groundwater wells within a 1-mile radius of the project site, no surface water intakes located within a 5-mile radius of the project site, and the project is not within the watershed of any public surface water intakes.

4(c) Conclusion. VDH-ODW concludes that there are no apparent impacts to public drinking water sources in Hampton Roads due to this proposal.

For additional information and coordination, contact VDH-ODW, Arlene Fields Warren at (804) 356-6658 or arlene.warren@vdh.virginia.gov.

5. Radiological Impacts. According to the DEIS/OEIS (page 3.1-1), while the Navy has removed all of the nuclear fuel, low-level radioactive, hazardous, and mixed radioactive and hazardous materials remain onboard the ship, and exposure to these materials during dismantlement needs to be assessed for potential effects on workers and the public. The DEIS/OEIS (page 3.1-9) states that the Navy estimates that dismantlement of all eight reactor plants under Alternative 3 (Preferred Alternative) would conservatively result in up to 440 shipments of large components and container express (CONEX) boxes or similarly sized packages of low-level radioactive waste being shipped by barge, rail, or truck to one or more waste facilities for disposal. Dismantlement activities would also generate a small number of additional shipments of low level radioactive waste (LLRW) incidental to disposal of the reactor plants, which would consist of material such as piping, tooling, and personal protective equipment. These additional wastes are similar to the small amounts of LLRW that are generated incidental to construction of reactor compartment packages and are disposed of at established waste disposal sites.

5(a) Agency Jurisdiction. The Virginia Department of Health (VDH) Office of Radiological Health (ORH) is responsible for protecting the public health and safety from unnecessary radiation from a diversity of sources that spans a wide spectrum of applications in the healing arts, research and educational institutions, and industry. VDH-DRH administers a licensing and inspection program for radioactive materials that are naturally-occurring or accelerator produced; registers, inspects and certifies X-ray machines in the Commonwealth; provides educational and technical assistance for

indoor radon; coordinates with the Department of Emergency Management for training activities and response to radiological emergencies; and collects environmental samples for radiological analysis near various fixed nuclear facilities.

5(b) Agency Findings. VDH-ORH reviewed the DEIS/OEIS and has no comments or concerns related to the proposed action.

For additional information, contact VDH-ORH, Matthew Ettinger at (804) 864-8160 or matthew.ettinger@vdh.virginia.gov.

6. Historic Resources. According to the DEIS/OEIS (page 3.7-23), the complete dismantlement of ex-Enterprise would occur at a commercial ship dismantling facility located in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama. Two cultural resources are located within the Hampton Roads Metropolitan Area study area, the Shipyard Office Building (121-0233) and Newport News Shipbuilding & Dry Dock Company Shipyard (121-0051). No known archaeological sites or traditional cultural properties (TCPs) are within the study area; historic records provide strong evidence that the shipyard was built on fill material. While ex-Enterprise is eligible for listing in the National Register of Historic Places (NRHP), the Navy has met its responsibilities for compliance with Section 106 of the NHPA concerning the final disposition of eligible vessels by following the Advisory Council on Historic Preservation procedures within the Program Comment for the Department of the Navy for the Disposition of Historic Vessels (75 Federal Register 12245) and no further mitigation is required.

6(a) Agency Jurisdiction. The Virginia Department of Historic Resources (DHR) conducts reviews of both federal and state projects to determine their effect on historic properties. Under the federal process, DHR is the State Historic Preservation Office, and ensures that federal undertakings-including licenses, permits, or funding-comply with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulation at 36 CFR Part 800. Section 106 requires federal agencies to consider the effects of federal projects on properties that are listed or eligible for listing on the National Register of Historic Places.

4.3

6(b) Agency Findings. The Navy determined the ex-ENTERPRISE (CVN 65) eligible for listing in the National Register of Historic Places (NRHP) as the nation's first nuclear-powered aircraft carrier. The DHR concurs with this assessment. DHR also agrees that the preferred alternative will adversely affect the historic vessel by resulting in its destruction. However, DHR acknowledges that the existing Program Comment for the evaluation and treatment of NRHP-eligible vessels to resolve adverse effects between the Navy and the Advisory Council on Historic Preservation already establishes a process to address the adverse effect caused by this undertaking. DHR anticipates that the Navy will fulfill its responsibility under Section 106 of the National Historic

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants
DEIS/OEIS, DEQ 22-137F

Preservation Act, as amended, for this undertaking by implementing the provisions in the Program Comment.

For additional information or coordination, contact DHR, Marc Holma at (804) 482-6090 or marc.holma@dhr.virginia.gov.

REGULATORY AND COORDINATION NEEDS

4.4 **1. Coastal Zone Management Act Federal Consistency.** Pursuant to the *Coastal Zone Management Act of 1972*, as amended, the Navy is required to determine the consistency of its activities affecting Virginia's coastal resources or coastal uses with the Virginia Coastal Zone Management (CZM) Program (see section 307(c)(1) of the *Act* and 15 CFR Part 930, sub-part C, section 930.34). This involves an analysis of the activities in light of the Enforceable Policies of the Virginia CZM Program, and submission of a consistency determination reflecting that analysis and committing the Navy to comply with the Enforceable Policies. The Navy is also encouraged to consider the effect of the proposal on the Advisory Policies of the Virginia CZM Program. This determination may be provided as part of the documentation concluding the NEPA process, or independently, depending on the agency's preference. Section 930.39 gives content requirements for the consistency determination, or you may visit the DEQ Federal Consistency website.

Thank you for the opportunity to review the Draft Environmental Impact Statement/Overseas Environmental Impact Statement for the Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants. Detailed comments of reviewing agencies are attached for your review. Please contact me at (804) 659-1915 or John Fisher at (804) 659-1919 for clarification of these comments.

Sincerely,

Bettina Rayfield, Program Manager
Environmental Impact Review and Long-Range Priorities

Enclosures

Ec: Amy Martin, DGIF
Allison Tillett, DCR
Claire Gorman, VMRC

Arlene Fields Warren, VDH
Roger Kirchen, DHR
Ben McFarlane, HRPDC
Cynthia Rohlf, Newport News

DEPARTMENT OF ENVIRONMENTAL QUALITY
TIDEWATER REGIONAL OFFICE

Environmental Impact Review
Coordination Review

To: Office of Environmental Impact Review

From: Jeff Hannah, Regional VWPP Program Manager

Date: September 16, 2022

Project: Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants, DEQ #22-137F

As requested, the DEQ Tidewater Regional Office has reviewed the supplied information and offers the following comments:

4.5

Air Compliance Program :
The following air regulations may be applicable: Virginia Administrative Code 9 VAC 5-50-60 *et seq*. which addresses the abatement of visible emissions and fugitive dust emissions, and Virginia Administrative Code 9 VAC 5-130-10 et *seq*. which addresses open burning. For additional information, contact John Brandt, DEQ-TRO at (757)407-2341.

4.6

Land Program (Solid and Hazardous Waste):
All construction and demolition waste, including any excess soil, must be characterized in accordance with the Virginia Hazardous Waste Management Regulations and disposed of at an appropriate facility as applicable.
For additional information, contact Melinda Woodruff, DEQ-TRO at melinda.woodruff@deq.virginia.gov .

Stormwater:
No comment as proposed scope of work does not include land disturbing activities.

Virginia Water Protection Permit Program (VWPP):
Potential adverse impacts to water quality and wetlands resulting from surface runoff due to the proposed activities must be minimized. This can be achieved by using Best Management Practices (BMPs). Permanent or temporary impacts to surface waters and wetlands may require DEQ authorization under §401 of the Clean Water Act, Virginia Code §62.1-44.15:20, and Virginia Administrative Code 9 VAC 25-210-10 *et seq*. Provided that any and all necessary permits are obtained and complied with, the project will be consistent with DEQ program requirements. For additional information, contact Jeff Hannah, DEQ-TRO at (757)407-2510.

Water Permit Program (VPDES):

No comments as there does not appear to be any point source discharges of process water or wastewater associated with this project that would necessitate a VPDES permit.

Petroleum Storage Tank Program:

4.7

DEQ records indicate there may be petroleum releases along the proposed project footprint. If evidence of a petroleum release is discovered during implementation of this project, it must be reported to DEQ, as authorized by CODE # 62.1-44.34.8 through 19 and 9 VAC 25-580-10 et seq. Contact Ms. Melinda Woodruff at (757)407-2516. Petroleum-contaminated soils and ground water generated during implementation of this project must be properly characterized and disposed of properly.

Installation and operation of any regulated petroleum storage tank(s) either AST or UST must also be conducted in accordance with the Virginia Regulations 9 VAC 25-91-10 et seq and / or 9 VAC 25-580-10 et seq. Documentation and / or questions should be submitted to TRO Tanks at Tidewater Regional Office – 5636 Southern Blvd., Virginia Beach, VA 23462. tro.tanks@deq.virginia.gov.

Based on the submitted information, it appears the proposed project will result in a *[Level of impact]* environmental impact.

COMMONWEALTH of VIRGINIA

Department of Historic Resources

Travis A. Voyles
Acting Secretary of Natural and Historic Resources

2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director
Tel: (804) 482-6446
Fax: (804) 367-2391
www.dhr.virginia.gov

6 September 2022

Office of Congressional and Public Affairs
Attn: Ex-Enterprise CVN 65 Draft EIS/OESIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Avenue, Stop 2072
Bremerton, Washington 98314-2072

RE: Disposal of Decommissioned Ex-ENTERPRISE (CVN 65)
DHR File No. 2022-0148

To Whom It May Concern:

The Department of Historic Resources (DHR), which in Virginia is the State Historic Preservation Office, received from the Navy notification of the availability of the Draft Environmental Impact Statement/Oversees Environmental Impact Statement (EIS/OEIS) addressing the alternatives for the disposal of the decommissioned, defueled ex-ENTERPRISE (CVN 65) aircraft carrier. It is our understanding, as expressed in the EIS/OEIS, that the Navy identified Alternative 3 as its preferred alternative. Alternative 3 is the commercial dismantlement of the former warship at one of three locations: the Hampton Roads metropolitan area, Virginia; Brownsville, Texas; or Mobile, Alabama.

4.8

The Navy determined the ex-ENTERPRISE (CVN 65) eligible for listing in the National Register of Historic Places (NRHP) as the nation's first nuclear-powered aircraft carrier. The DHR concurs with this assessment. We also agree that the preferred alternative will adversely affect the historic vessel by resulting in its destruction. However, DHR acknowledges that the existing Program Comment for the evaluation and treatment of NRHP-eligible vessels to resolve adverse effects between the Navy and the Advisory Council on Historic Preservation already establishes a process to address the adverse effect caused by this undertaking. We anticipate that the Navy will fulfill its responsibility under Section 106 of the National Historic Preservation Act, as amended, for this undertaking by implementing the provisions in the Program Comment.

If you have any questions, please call me at (804) 482-6090.

Sincerely,

Marc Holma, Architectural Historian
Office of Review and Compliance

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5443
Fax: (540) 387-5446

Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Commonwealth of Virginia

Fisher, John <john.fisher@deq.virginia.gov>

Re: Project Title: Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants

1 message

Warren, Arlene <arlene.warren@vdh.virginia.gov> Mon, Sep 12, 2022 at 11:08 AM
To: John Fisher <john.fisher@deq.virginia.gov>, rr Environmental Impact Review <eir@deq.virginia.gov>

Project Name: Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants
Project #: 22-137F
UPC #: N/A
Location: Newport News VA

VDH – Office of Drinking Water has reviewed the above project. Below are our comments as they relate to proximity to public drinking water sources (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility.

There are no public groundwater wells within a 1-mile radius of the project site.

There are no surface water intakes located within a 5-mile radius of the project site.

The project is not within the watershed of any public surface water intakes.

There are no apparent impacts to public drinking water sources due to this project.

- **Comments from Director, Matthew Ettinger were** *"The Office of Radiological Health has reviewed all of the materials associated with Project Title: Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants. We have no comments or concerns related to the work proposed in the project documentation."*

- **Comments from Dwight Flammia, Ph.D. State Public Health Toxicologist Virginia Department of Health** were *"no comments to add."*

- **Comments from OEHS Division of Shellfish Sanitation, Mr. Adam Wood VDH were** *"this project will not impact shellfish condemnation areas."*

The Virginia Department of Health – Office of Drinking Water appreciates the opportunity to provide comments. If you have any questions, please let me know.

Best Regards,

Arlene F. Warren
GIS Program Support Technician
Virginia Department of Health, Office of Drinking Water
109 Governor Street, 6th Floor
Richmond, VA 23219
804-356-6658 (office/cell/text)

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

MEMORANDUM

DATE: September 22, 2022

TO: John Fisher

FROM: Allison Tillett, Environmental Impact Review Coordinator

Matthew S. Wells

SUBJECT: DEQ 22-137F, Disposal of Decommissioned, Defueled Ex-Enterprise and Naval Reactor Plants

for Operations

Division of Planning and Recreation Resources

for

The Department of Conservation and Recreation (DCR), Division of Planning and Recreational Resources (PRR), develops the *Virginia Outdoors Plan* and coordinates a broad range of recreational and environmental programs throughout Virginia. These include the Virginia Scenic Rivers program; Trails, Greenways, and Blueways; Virginia State Park Master Planning and State Park Design and Construction. PRR also administers the Land & Water Conservation Fund (LWCF) program in Virginia.

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-foot buffer. Please note, a predictive model identifying potential habitat for natural heritage resources intersects the project boundary. However, based on DCR biologist's review of the proposed project a survey is not recommended for the resource.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

4.9 New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The VDWR maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Amy Martin at (804-367-2211) or amy.martin@dwr.virginia.gov. According to the information currently in our files, the James River, which has been designated by the VDWR as a "Threatened and Endangered Species Water" for the Atlantic sturgeon is within the submitted project boundary including a 100-foot buffer. Therefore, DCR recommends coordination with the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) and Virginia's regulatory authority for the management and protection of this species, the VDWR, to ensure compliance with protected species legislation.

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: John Fisher

We thank OEIR for providing DEQ-AIR an opportunity to review the following project: Accordingly, I am providing following comments for consideration.

Document Type: Environmental Impact Statement/Overseas Environmental Impact Statement
Project Sponsor: DOD/U.S. Navy
Project Title: Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants
Location: City of Newport News
Project Number: DEQ #22-137F

PROJECT LOCATION: X OZONE ATTAINMENT AND EMISSION CONTROL AREA FOR NOX & VOC

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO: X CONSTRUCTION ☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-45-760 et seq. – Asphalt Paving operations
3. X **9 VAC 5-130 et seq. – Open Burning**
4. X **9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
5. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
6. ☐ 9 VAC 5-60-300 et seq. – Standards of Performance for Toxic Pollutants
7. ☐ 9 VAC 5-50-400 Subpart____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
8. ☐ 9 VAC 5-80-1100 et seq. of the regulations – Permits for Stationary Sources
9. ☐ 9 VAC 5-80-1605 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
10. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
11. ☐ 9 VAC 5-80-800 et seq. Of the regulations – State Operating Permits. This rule may be applicable to _____

4.10 COMMENTS SPECIFIC TO THE PROJECT:
All precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_x).

K. S. Narasimhan

(Kotur S. Narasimhan)
Office of Air Data Analysis DATE: August 26, 2022

Comment Document #5

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Richland Field Office
3100 Port of Benton Blvd., Richland, WA 99354 • 509-372-7950

September 28, 2022 22-NWP-126

Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Re: Ecology Nuclear Waste Program comment on Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants EIS/OEIS

Reference: See page 2

Dear Office of Congressional and Public Affairs:

The Department of Ecology, Nuclear Waste Program (NWP) has regulatory authority over Trench 94 at the US Department of Energy Hanford Site. I provide the following comments on the "Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants EIS/OEIS" (Reference).

5.1 The NWP endorses the EIS/OEIS Preferred Alternative (#3), commercial dismantlement then disposal at a commercial Low-Level Radioactive Waste site. If the Navy does not select Alternative #3, NWP prefers Alternative #1 over Alternative #2, because of the greater environmental impacts of Alternative #2 compared to Alternative #1.

If you have questions or need further information, please contact me at john.price@ecy.wa.gov or 509-521-9834.

Sincerely,

John B. Price

John B. Price
TPA Section Manager
Nuclear Waste Program

tla

cc: See page 2

Office of Congressional and Public Affairs 22-NWP-126
September 28, 2022
Page 2 of 2

Reference: Reference: Letter 5090 Ser 08U/22-02735, dated August 15, 2022, "Notice of Availability of the Disposal of Decomissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants Draft Environmental Impact Statemen/Overseas Environmental Impact Statement and Notice of Virtual Public Meetings

cc electronic:
Dave Einan, EPA
Jaqueline Allen, PSNS
Kristin Hay, PSNS
Bret Ragsdale, PSNS
Aaron Stone, PSNS
Michael Tart, PSNS
Debra Alexander, Ecology
Theresa Howell, Ecology
Brenden McFarland, Ecology
John Price, Ecology
Naoko Schiffern, Ecology
Ecology SEPA Register

To request ADA accommodation including materials in a format for the visually impaired, call Ecology at (509) 372-7950 or visit https://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with speech disability may call TTY at (877) 833-6341.

Review Comments

5.2
1. Pg. 3.4-3, Figure 3.4-2: Washington Region of Influence – The DOE Hanford Site. The legend shown as DOE Hanford Site is not correct. It appears that the legend shows Hanford's 200 Area where Trench 94 is located.

5.3
2. Draft EIS/OEIS evaluates potential impacts on socioeconomic and environmental justice conditions from the proposed action and no action alternatives (Section 3.4, Socioeconomics and Environmental Justice). The analysis is based on identifying low income population, minority population, and races in the affected areas. Ecology believes that this analysis should also identify populations in the affected areas who may have barriers to engagement or access to information. Those populations could be identified based on education level and those who speak English "less than very well". *See* Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency. Ecology suggests further evaluation using EPA's EJSCREEN.

5.4
3. Section 3.4 in the Draft EIS/OEIS evaluates potential impacts on environmental justice conditions per Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994) and Title VI of the Civil Rights Act of 1964. Ecology suggests adding the following regulations and Executive Orders to the analysis for potential impacts on environmental justice in the EIS/OEIS.
    a. Title IX of the Education Amendments of 1972
    b. Section 504 of the Rehabilitation Act of 1973
    c. Age Discrimination Act of 1975
    d. Federal Water Pollution Control Act Amendments of 1972
    e. Executive Order 14008, Tackling the Climate Crisis at Home and Abroad
    f. Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency
    g. Executive Order 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis
    h. Executive Order 13985, Advancing Racial Equity and Support for Underserved
    i. Communities Through the Federal Government

5.5
4. There are 29 federally recognized tribes in Washington State. Among those, 15 are recognized as "Pacific Northwest tribes have traditional resources or treaty rights considered in the Pacific Northwest ROI" for the analysis of American Indian Tribal Resources and Treaty Rights (Section 3.3.2). According to Table B-1, 19 of them received the scoping notification letters. Ecology suggests including, at a minimum, The Confederated Tribes of the Chehalis Reservation and the Squaxin Island Tribe.

Comment Document #6

ALABAMA HISTORICAL COMMISSION

Lisa D. Jones
Executive Director
State Historic Preservation Officer

468 South Perry Street
Montgomery, Alabama 36130-0900

Tel: 334-242-3184
Fax: 334-242-1083

September 16, 2022

Office of Congressional and Public Affairs
Attn: Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Avenue Stop 2072
Bremerton, WA 98314-2072

Re: AHC 22-1033
Draft EIS. Overseas EIS for Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants
Statewide

To whom it may concern:

6.1 Upon review of the materials associated with the above referenced Environmental Impact Statement, we find that only Alternative 3 relates to resources located within the State of Alabama. If this Alternative is selected, with the stipulation that no new infrastructure will be required, we agree that any effects to historic properties under this Alternative would likely be temporary in nature. Therefore, we agree with the determination of no adverse effect to historic properties.

Consultation with the State Historic Preservation Office does not constitute consultation with Tribal Historic Preservation Offices, other Native American tribes, local governments, or the public.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact Eric Sipes at 334.230.2667 or Eric.Sipes@ahc.alabama.gov. Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

Lee Anne Wofford

Lee Anne Wofford
Deputy State Historic Preservation Officer

LAW/EDS/AMH/LWT/nj

Comment Document #7

TEXAS HISTORICAL COMMISSION
REAL PLACES TELLING REAL STORIES

P.O. Box 12276
Austin, Texas 78711-2276
512-463-6100
thc.texas.gov

September 16, 2022

Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Re: Project review under Section 106 of the National Historic Preservation Act of 1966, DISPOSAL OF DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65) AND ITS ASSOCIATED NAVAL REACTOR PLANTS EIS/OEIS (DOD/106, eTRAC# 202300194)

To Whom It May Concern:

Thank you for your correspondence describing the above-referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Alexander Shane, has completed its review. We understand the project involves the preparation of a Draft Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) by the United States (U.S.) Department of the Navy (Navy) to evaluate the potential environmental impacts associated with disposal of the decommissioned, defueled aircraft carrier ex-Enterprise (CVN 65) including its naval reactor plants.

The History Programs Division review staff, led by Caitlin Brashear, concurs that the Ex-Enterprise, the first nuclear-powered aircraft carrier in the world, is Eligible for Listing in the National Register of Historic Places (NRHP). Additionally, regarding the Texas Cultural Resources Study Area, it should be noted that the Port of Brownsville was previously determined eligible for listing in the NRHP.

The Division of Architecture Review Staff, led by Alexander Shane, cannot make an accurate determination of effect at this time based on the project information. Our staff requests a supplementary submission of additional information explaining how the Navy met their proposed treatment steps in
7.1 program comment entitled, "Program Comment Pursuant to 36 C.F.R. § 800.14(e) Implementing Section 106 of the National Historic Preservation Act for the Evaluation of Vessels for Eligibility for Listing in the National Register of Historic Places and the Treatment of Eligible Vessels to Resolve Adverse Effects that May Result from Certain Methods of Final Disposition" including, an itemized documentation package list of historically significant records transferred to NARA, a history of the vessel in the Dictionary of American Naval Fighting Ships, a list of items removed from the ship procured by the Navy Curator and eligible non-profit organizations, a Booklet of General Plans, and the last report of Board of Inspection and Survey describing the material condition of the vessel.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Alexander Shane at 512.463.8952.**

Sincerely,

Alexander Shane, Central & West Texas and Military sites Project Reviewer, Division of Architecture
For: Mark Wolfe, Executive Director
MW/AS

GREG ABBOTT, GOVERNOR | JOHN L. NAU, III, CHAIR | MARK WOLFE, EXECUTIVE DIRECTOR

Comment Document #8

COMMONWEALTH of VIRGINIA

Department of Historic Resources

Travis A. Voyles
Acting Secretary of Natural and Historic Resources

2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director
Tel: (804) 482-6446
Fax: (804) 367-2391
www.dhr.virginia.gov

6 September 2022

Office of Congressional and Public Affairs
Attn: Ex-Enterprise CVN 65 Draft EIS/OESIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Avenue, Stop 2072
Bremerton, Washington 98314-2072

RE: Disposal of Decommissioned Ex-ENTERPRISE (CVN 65)
DHR File No. 2022-0148

To Whom It May Concern:

The Department of Historic Resources (DHR), which in Virginia is the State Historic Preservation Office, received from the Navy notification of the availability of the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) addressing the alternatives for the disposal of the decommissioned, defueled ex-ENTERPRISE (CVN 65) aircraft carrier. It is our understanding, as expressed in the EIS/OEIS, that the Navy identified Alternative 3 as its preferred alternative. Alternative 3 is the commercial dismantlement of the former warship at one of three locations: the Hampton Roads metropolitan area, Virginia; Brownsville, Texas; or Mobile, Alabama.

8.1 The Navy determined the ex-ENTERPRISE (CVN 65) eligible for listing in the National Register of Historic Places (NRHP) as the nation's first nuclear-powered aircraft carrier. The DHR concurs with this assessment. We also agree that the preferred alternative will adversely affect the historic vessel by resulting in its destruction. However, DHR acknowledges that the existing Program Comment for the evaluation and treatment of NRHP-eligible vessels to resolve adverse effects between the Navy and the Advisory Council on Historic Preservation already establishes a process to address the adverse effect caused by this undertaking. We anticipate that the Navy will fulfill its responsibility under Section 106 of the National Historic Preservation Act, as amended, for this undertaking by implementing the provisions in the Program Comment.

If you have any questions, please call me at (804) 482-6090.

Sincerely,

Marc Holma, Architectural Historian
Office of Review and Compliance

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Richmond, VA 23221
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Fax: (804) 367-2391

C.2.4 Non-Government Organizations

C.2.4.1 Mobile Bay Sierra Club

#	Comment	Response
9.1	One measure used to justify Alternative 3 considers only the final-mile infrastructure costs required for moving the double-size containers via barge between PSNS and Hanford (Alternative 2). Claiming no "Required Infrastructure Improvements" the Navy conveniently ignores the state of existing surface infrastructure components and potential improvements needed to meet the safety considerations for transporting hundreds of LLRW containers across aging bridges, roadways, and rail crossings. The DEIS notes that there will be a number of other LLRW shipments associated with dismantlement efforts unrelated to the specific reactor components. The Navy claims that these would be equivalent between all three action alternatives (but not equivalent to the original FONSI action), however the unconsidered additional container-miles would be greater for sites selected in Alternative 3, and the associated surface infrastructure impacts should be addressed, as noted above.	Waste transportation and other aspects of the proposed dismantlement would be conducted in accordance with applicable Nuclear Regulatory Commission (NRC), Department of Transportation, and Department of Energy regulations. Alternative 3 (Preferred Alternative) would utilize existing infrastructure to transport low-level radioactive waste. Section 3.8 (Noise) of this EIS/OEIS conservatively estimates the total number of shipments for the entire ex-Enterprise volume (e.g., inclusive of the 440 estimated low-level radioactive waste shipments and any additional recyclable, radioactive, or non-radioactive material) as 3,000 container express (commonly known as CONEX) boxes. This results in no more than three shipments on average per day. The Mobile port area has immediate access to rail and multiple freeways, with a capacity of over 650,000 CONEX boxes a year. For perspective, the Port of Alabama shipped over 50,000 CONEX boxes in July 2022, or more than 1,600 CONEX boxes per day on average. All land routes proposed are currently used for trucking, and the number of vehicles added to these routes would be low and spread out over a two-and-a-half-year period with negligible impact on land transportation. Concerns pertaining to the current status of operating transportation infrastructure, including bridges, roadways, and rail crossings, are outside the scope of this EIS/OEIS.
9.2	This DEIS relies heavily on Best Management Practices: the term appears 78 times and assumes that the voluntary methods will always be chosen by the contractor. As experienced time and again in the environmental advocacy community, BMPs too often translate to wishful thinking.	The Navy defines Best Management Practices (BMPs) as existing policies, practices, and measures that the Navy would adopt to reduce the environmental impacts of designated activities, functions, or processes. BMPs include actions required by federal or state law or regulation. Section 2.6 (Best Management Practices Included in Proposed Action) of this EIS/OEIS addresses BMPs for the Proposed Action and identifies applicable regulations. Further, contractual decisions regarding a selected dismantlement contractor, if any, are outside of the scope of this EIS/OEIS; however, BMPs are not "wishful thinking." For example, this EIS/OEIS commits to several BMPs

#	Comment	Response
		related to Port of Benton barge slip work supporting Alternative 2. These commitments would be implemented through the contract to perform this work if Alternative 2 is selected.
9.3	The Navy's claim that "new disposal alternatives… may be more cost-effective" at public shipyards is speculative. Cost overruns and contract rescoping for DoD programs after the initial award are not unusual at commercial shipyards. Related, one could confidently expect the commercial for-profit entities like EnergySolutions (UT) and Waste Control Specialists, LLC (TX) to seek modification to their RADWASATE storage permits and other profit-driven changes over time. Current rational stewardship protocols that help win a taxpayer-funded contract could later be rephrased as excessive caution that harm stakeholders' bottom-line. This may simply be a scheme to spread ship-breaking around the country and provide local jobs – something called pork-barrel by politicians not located in the target areas where the practice may influence voters. Or it could be another example of welfare programs awarded to business entities. Recently the ex-Kitty Hawk and ex-John F. Kennedy which were sold to International Shipbreaking Ltd., (a subsidiary of global scrap metal company European Metal Recycling) in Brownsville for only one cent apiece. Either way, this is an inadvisable solution compared to the original proposal and should be discarded without further debate.	The preferred alternative of commercial disposal eliminates the potential for long-term waterborne storage of legacy radioactive and hazardous materials, disposes of these materials, and dismantles the ex-Enterprise in an environmentally safe manner that is cost effective and protective of the workforce and the public, while also minimizing the impact on the Navy's maintenance mission. The work to evaluate the options for ex-Enterprise disposal was completed by a team of professionals from multiple organizations without political influence, listed in Section 6 (List of Preparers) of this EIS/OEIS.

#	Comment	Response
9.4	The Alabama Department of Environmental Management has one of the poorest performance records in the country, and hopefully the Navy will consider this poor performance criteria and not award this project to Mobile Alabama. Sincerely, Mobile Bay Sierra Club Executive Committee	The health and safety of the public, military and civilian personnel, and the environment are of utmost importance to the Navy. The Navy's procedures for protection of people and the environment meet or exceed all applicable federal, state, and local environmental health and safety laws and regulations. The Navy remains committed to this high standard. A commercial vendor would be subject to all applicable local, state, and federal environmental and radiation protection requirements during dismantlement of ex-Enterprise. The Navy would enforce compliance with these requirements via the contract and have on-site personnel observing the work for contract compliance. Additionally, as discussed in this EIS/OEIS, the Navy envisions using the NRC to provide technical support and inspection services for the work as well. Finally, the Navy will provide and ensure necessary regulator and stakeholder outreach and support, to drive communication and engagement to support completing ex-Enterprise disposal in a manner that is protective of workers, the public, and the environment. The ship recycling industries at all analyzed locations (including Mobile Bay) have established capabilities for maintenance, dismantlement, and disposal work on large ships of this size. Any environmental impacts due to these existing industries are not expected to be affected by the additional work of dismantling ex-Enterprise. For example, during EIS/OEIS scoping in 2019, the Navy received comments from a company located in Mobile, Modern American Recycling Services, which dismantles and recycles oil rigs and ships and has the capacity to recycle up to 200,000 tons of metal per year.

Comment Document #9

SIERRA CLUB
FOUNDED 1892
Mobile Bay Sierra Club
PO Box 2682 Mobile, Al 36652

October 3, 2022

Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, WA 98314-2072

Regarding: *DEIS OVERSEAS ENVIRONMENTAL IMPACT STATEMENT FOR DISPOSAL OF DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65) AND ITS ASSOCIATED NAVAL REACTOR PLANTS*

Summary: USS Enterprise was constructed with eight naval reactor plants housed in rugged compartments inside the ship. As part of the decommissioning process, the nuclear fuel has been removed from the ship's eight reactor plants. The Proposed Action would entail dismantling and recycling the non-radioactive remnant hull sections of ex-Enterprise at a government or authorized commercial facility in accordance with applicable federal, state, and local laws, and removing and packaging of ex-Enterprise reactor plant components for transportation and disposal as low-level radioactive waste to authorized radioactive waste disposal facilities.

Perspective: As of October 2021, the Navy has successfully shipped 138 reactor compartment packages from inactivated, defueled nuclear ships using the process reviewed and agreed upon by all relevant agencies (1984 Record of Decision). This existing proven concept received a FONSI when considered for ex-Enterprise. The Navy admits -- in its dissonant justification to award the task to a commercial shipyard -- that the PSNS & IMF workforce is "specially trained and qualified" for this type of work.

The commitment being revisited is part and parcel of producing and operating the world's largest and most capable defensive force. For Navy nuclear programs to get initial approval and funding, the lifecycle plans and costs had to be analyzed and

approved. To shift the obligation for control of the resulting nuclear waste, putting it in the hands of the for-profit sector, would be risky and irresponsible.

This decision should not be based on wishful thinking that the best solution is also the fastest and cheapest. There is an axiom among engineers: fast, cheap or effective – choose one. The attempt to diverge from the previous proposal ignores the likely profit-driven decisions seeking to cut operational costs at every turn, the dilution of responsibility and oversight that is typical with subcontracts supporting DoD awards, the inherent lack of government control over commercial operations, and the vast increase of container-miles needed to transport an undetermined number of LLRW containers with the associated risk of accidents along the travel corridors and losses in the supply-chain.

Alternative 1: Modifies the process described in the 2012 decision -- decommissioned CVN-65 towed to PSNS & IMF in Bremerton, Washington, for dismantlement -- by towing the entire ex-Enterprise from Newport News Shipbuilding along the coastline to a chosen commercial dismantlement facility in the Hampton Roads Metropolitan Area (VA), Brownsville (TX), or Mobile (AL), where it would be partially dismantled by removing areas of the ship outside of reactor compartments. The propulsion space section, which contains the eight defueled reactor plants, would then be transported by heavy-lift ship around South America to PSNS, for further dismantlement and disposal by those best qualified. The LLRW would be transported for storage nearby at Hanford as in the original decision.

Alternative 2: The same process as Alternative 1 except the method of final shipment of the reactor compartment sections dismantled at PSNS would entail four larger (vice eight smaller) containers and require modifications to the final-mile infrastructure between PSNS and Hanford.

Alternative 3: The same process as Alternative 1 except the entire defueled reactor plant components would also be dismantled at the chosen commercial shipyard in AL, SC or TX. Disassembly for packaging and transport would increase the number of shipping containers for the ex-Enterprise's defueled reactor plants from eight (as in Alternative 1) or four (as in Alternative 2) to four-hundred and forty (440) separate containers. The LLRW containers would be trucked across US roadways from the chosen commercial shipyard to be recycled or disposed of at three suggested facilities in TX, UT and/or SC. Transportation of the LLRW containers would involve oversight by the NRC, DOT and DOE.

2

9.1 **Comments:** One measure used to justify Alternative 3 considers only the final-mile infrastructure costs required for moving the double-size containers via barge between PSNS and Hanford (Alternative 2). Claiming no "Required Infrastructure Improvements" the Navy conveniently ignores the state of existing surface infrastructure components and potential improvements needed to meet the safety considerations for transporting hundreds of LLRW containers across aging bridges, roadways, and rail crossings.
The DEIS notes that there will be a number of other LLRW shipments associated with dismantlement efforts unrelated to the specific reactor components. The Navy claims that these would be equivalent between all three action alternatives (but not equivalent to the original FONSI action), however the unconsidered additional container-miles would be greater for sites selected in Alternative 3, and the associated surface infrastructure impacts should be addressed, as noted above.

9.2 This DEIS relies heavily on Best Management Practices: the term appears 78 times and assumes that the voluntary methods will always be chosen by the contractor. As experienced time and again in the environmental advocacy community, BMPs too often translate to *wishful thinking*.
The Navy's claim that "new disposal alternatives… may be more cost-effective" at public shipyards is speculative. Cost overruns and contract rescoping for DoD programs after the initial award are not unusual at commercial shipyards.
Related, one could confidently expect the commercial for-profit entities like EnergySolutions (UT) and Waste Control Specialists, LLC (TX) to seek modifications to their RADWASTE storage permits and other profit-driven changes over time. Current *rational stewardship* protocols that help win a taxpayer-funded contract could later be rephrased as *excessive caution* that harm stakeholders' bottom-line.

This may simply be a scheme to spread ship-breaking around the country and provide local jobs – something called pork-barrel by politicians not located in the target areas where the practice may influence voters.
Or it could be another example of welfare programs awarded to business entities. Recently the ex-Kitty Hawk and ex-John F. Kennedy which were sold to International Shipbreaking Ltd., (a subsidiary of global scrap metal company European Metal Recycling) in Brownsville for only one cent apiece.
Either way, this is an inadvisable solution compared to the original proposal and should be discarded without further debate.

3

9.3 The Alabama Department of Environmental Management has one of the poorest performance records in the country, and hopefully the Navy will consider this poor performance criteria and not award this project to Mobile Alabamma.

Sincerely,

Mobile Bay Sierra Club Executive Committee

Joseph Mahoney, Chair
250 Michigan Ave, Mobile, AL, 36604
josephmahoney250@gmail.com

Carol Adams-Davis, Vice Chair
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C.2.5 Citizens

C.2.5.1 B. Alexander

#	Comment	Response
10.1	1. The Hanford site consideration. Additional consideration regarding the Hanford site needs to be accurately reflected in terms of the history of and continuing cleanup efforts at the Hanford site as the result of the Superfund starting in 1988. Additional risk regarding efforts in the events regarding on site single shell tanks regarding radioactive waste need to be considered as well as their current leak rates. a. The public needs to know this background, considerations and what the Navy is planning to do to prevent this considerable amount of leakage possible surrounding the decommissioning process utilizing the facility. Environmental stewardship needs to pave the way to making the Hanford site more environmentally friendly verses the past. If leaks happen from CVN-65 waste stream this should not add to the significant cost already occurring as the cleanup and remediation continues. b. Goal: We do not want to any CVN-65 product leaking into to the Hanford site and make it worse than it already is.	1. Addressing legacy waste and remediation of waste tanks is outside the scope of this EIS/OEIS. The Navy has addressed disposal of Navy reactor compartments in other previous EISs (1984 and 1996). 1a. The Navy is not proposing that dismantlement activities take place at Department of Energy (DOE) Hanford Site. Therefore, there would be no "leakage possible surrounding the decommissioning process" that could impact the DOE Hanford Site. The DOE Hanford Site would be utilized only for the disposal of solid waste in the form of reactor compartment packages. 1b. Reactor compartment package disposals in Trench 94 are protective of the environment and compliant with all federal and state requirements. Section 4 and Appendix B of the 1996 EIS, which are incorporated by reference into this EIS/OEIS, provide a detailed discussion that documents the reactor compartment package Trench 94 disposal analysis.
10.2	2. Regarding ES.5- Were any other agencies outside of the Navy, NAVSEA, NR or DOE considered in alternative planning? What other public-private partnerships formed this conclusion as #3? Why were alternative options not considered; if it was cost, we need to state that. Did any conclusions cost less; and were they considered?	The Navy collaborated with DOE and the Nuclear Regulatory Commission to develop the alternatives presented in this EIS/OEIS. Several industry events were held to gauge the capabilities and willingness of the shipbreaking industry to dismantle ex-Enterprise. The information gathered during these events helped inform the alternatives in this EIS/OEIS, including the additional consideration of Mobile, Alabama. See EIS/OEIS Section 2.2 (Screening Criteria) for the screening criteria used to develop the alternatives considered.
10.3	3. Regarding ES.7- For low level radioactive waste, we are talking <450uuCi/method/cm2/scan, equivalent Co-60? What is the definition of LLRW?	The Nuclear Waste Policy Act of 1982, as Amended (42 United States Code 10101) defines low-level radioactive waste as radioactive material that (A) is not high-level radioactive waste, spent nuclear fuel, transuranic waste, or by-product material as defined in section 11e(2) of the Atomic Energy Act of

#	Comment	Response
		1954 [42 United States Code 2014(e)(2)]; and (B) the Commission, consistent with existing law, classifies as low-level radioactive waste. The Navy would continue to ensure all radioactive material and waste is properly characterized to inform the necessary controls to protect the public and environment.
10.4	4. Regarding the pressure of contracts to complete this work: We the public understand the pressure of contracts and shipyard workers. However, the long-term consequences of not getting this right in the beginning has consequences as well. The decommissioning and responsible dismantling of the USS Enterprise is just as important as delivering a new carrier or submarine. If we are demonstrating and placing environmental policy as a priority; this process is as or more important than the delivery of a new carrier or submarine. If this is the case then we need to do what we say, rather than say what we do. If labor is the issue, we need to state that. There is nothing in here about the delays as the result of COVID-19 or the slow-down in materials regarding this project.	As described in Section 2.4 (Preferred Alternative), the workforce of Navy public shipyards has been under tremendous pressure to execute their primary mission of maintaining the operational fleet. Commercial dismantlement of ex-Enterprise would allow the Navy to keep the specially trained and qualified PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivations and reactor compartment package work that are already part of the PSNS & IMF workload.
10.5	5. Regarding ES.7-4: Concur and recommend Savannah River Site as primary, the other two sites can accept any other waste that is not allowed at SRS. For PSWET tanks and adjacent painted surfaces, has consideration been given for fixed contamination regarding Zn-65 isotopes? What would be the LLRW for this isotope and would you consider the <1pCi/g of this material to be LLRW? What other radiological controls would you institute to consider Co-60 equivalent and how would they be measured during the term of the execution of the contract, who would do this measurement and who gets the reports?	Under the Preferred Alternative, complete commercial dismantlement (Alternative 3 [Preferred Alternative]), it is expected that the majority of radiological waste would be shipped to authorized low level radioactive waste facilities such as the commercial disposal facilities in Texas and Utah. Specific details of components is outside the scope of this EIS/OEIS. The radionuclides of concern remaining in ex-Enterprise are presented in Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants), Table F-3 (Corrosion Product Radionuclide Inventory per Reactor Plant). Zinc-65 is not included as it has a half-life of a little over half a year (244 days), which means approximately 0.6 percent of what existed in 2017 remains in 2022. Therefore Zinc-65 is not a significant contributor to the amount of radioactivity remaining in ex-Enterprise long-term. Controls, measurement, and reporting would be in accordance with Nuclear Regulatory Commission regulations specified in 10 CFR Part 20.

#	Comment	Response
10.6	6. Regarding ES.8.1: I concur on all fronts. However, we also need to state and loudly echo that ALARA will be maintained as the standard.	Commenter preference acknowledged. Chapter 2 (Description of Proposed Action and Alternatives), Section 2.3.2.5.1 (Liquid Removal) as well as Sections 3.1 (Section 3.1.3.4.2 [Complete Dismantlement of ex-Enterprise at Commercial Facility {Includes In-Water Work}]) and 3.2 (Section 3.2.1.3 [Best Management Practices]) state and reaffirm "as low as reasonably achievable" concepts.
10.7	7. Regarding 2.6.3.2: What radionuclides are of concerned that are long lived outside ofCo-60 and Zn-65 during teardown of this project in PSWT/RC/RAR/AMR spaces? Where are these prevalent and to what concentrations are of concern?	Appendix E (Radiological Evaluation of Reactor Plant Disposal Alternatives) of the Final EIS/OEIS contains the radiological evaluation of the reactor plant alternatives, which includes discussion of long-lived radionuclides (including primary radionuclides such as nickel-63 and nickel-59).
10.8	8. Regarding: 3.1.1.3.2 Atomic Energy Act-Expand this if possible.	The Final EIS/OEIS has been updated to include additional information summarizing the Atomic Energy Act.
10.9	9. Regarding 3.2.2.1.2-PCBs-We need to divide the expected PCB waste into the respective Aroclors to understand the impact of environmental leaching. a. Which PCBs are you talking about and in what concentration are expected? An average is okay as well. Is it <50ppm? b. Are we talking 1016/1248/1268? These are all mixtures but understanding which ones are where regarding the reactor plants, PSWT, and AMR/RAR spaces will help greatly. When you say tons of material, this doesn't help to quantify concentration or indicate the magnitude of the risk.	The EIS/OEIS scope includes all radioactive wastes, including mixed wastes. Detailed waste characterization is outside the scope of this EIS/OEIS.
10.10	Regarding: 3.2.2.1.4-Are we discussing Chromates as Cr3+, Cr6+ and what controls are being considered to protect worker exposure to Chromates. Additionally, for PSWT are Zn-65 radionuclides considered in addition to Chromates? What would be the exposure limits of both be to the labor force? What controls would be instituted and how would this waste stream be handled?	Zinc-65 is not a significant contributor to the amount of radioactivity remaining in ex-Enterprise long-term due to its 244 day half-life. A description of and the methods to control and process the radioactive potassium chromate solution are presented in this EIS/OEIS in Section 3.2.2.1.4 (Radioactive Potassium Chromate). Typically, handling potassium chromate solution requires nitrile or neoprene gloves, chemical-resistant clothing, indirect vent goggles, a face shield, and chemical-resistant footwear. A respirator may also be used for further protection. All work that includes this

#	Comment	Response
		chemical is planned and prepared to minimize personnel exposure to the chemical health hazards, which also minimizes exposure to any radioactivity present.

C.2.5.2 G. Baumer

#	Comment	Response
11.1	As a veteran serving many days upon the USS Enterprise (CVN 65) my concern is mostly of respecting the ship's legacy while disposing of its remains. This ship served the United States honorably for a long time. So my concern, knowingly is emotionally based, it's still a concern on ensuring respect is shown when possible. She was the best ship I served on and still holds a place in my soul.	Preservation of the history of the ship is important to the Navy. In accordance with the Advisory Council on Historic Preservation's Program Comment for the Department of the Navy for the Disposition of Historic Vessels (75 Federal Register 12245), the Navy has documented the history of the ship, and Navy curators have also removed and preserved historical artifacts from the ship. Actions conducted to date, as well as those scheduled to occur, are described in Section 3.7.2.1 (Ex-Enterprise [CVN-65]) of the Final EIS/OEIS.

C.2.5.3 G. Berka

#	Comment	Response
12.1	Good Morning, Convert the Enterprise into the new Savannah, and put her to use as a climate and national heritage ambassador! The Nuclear Ship Savannah was the U.S.'s first and only civilian, nuclear-powered merchant ship. She showed great potential, and was removed from service largely for just economic reasons. Today, the situation is different. The specter of climate change is drawing renewed attention to civilian, nuclear-powered shipping as a low-carbon alternative to bunker oil. The Enterprise may potentially fit this role quite well. Her enormous capacity could make her a useful cargo ship, and she could potentially also fulfill other roles, such as humanitarian and disaster relief missions. Not to mention being a dispatchable, floating,	Commenter preference acknowledged. As described in Chapter 2 (Description of Proposed Action and Alternatives) of this EIS/OEIS, dismantling is the only method approved for the disposition of nuclear-powered ships stricken from the Naval Vessel Register in accordance with Office of the Chief of Naval Operations Instruction 4770.5J, General Policy for the Inactivation, Retirement, and Disposition of U.S. Naval Vessels, and is required to be accomplished in the United States or its territories in accordance with existing laws and regulations. Any non-dismantling or non-United States alternatives were eliminated from analysis as they would not follow this policy.

#	Comment	Response
	nuclear power plant, capable of being quickly sailed to where she is needed. She could have done a great deal of good if moored in New York Harbor, to cleanly power New York City during the outage after Hurricane Sandy. Or in Puerto Rico after Hurricane Maria. With her special place in history and national heritage value, she could also be an operational, floating museum, open for public tours. If her (8) reactors have not been removed yet, refuel them and return them to service! This ship is far too important and valuable to turn into scrap metal. It would be a bold statement for both national heritage and the climate, to continue operating her as a magnificent, carbon-free vessel.	

C.2.5.4 B. Caddell

#	Comment	Response
13.1	I am extremely concerned about the location of proposed Alternative 3 which includes the use of private contractors to dismantle the ship and dispose of the non-nuclear waste generated by this operation. I object to the use of the Port of Mobile for this project for the following reasons: • Weak regulatory agencies will be tasked with monitoring compliance with appropriate regulations. ADEM is the state agency tasked with enforcing compliance and ADEM's Air Quality Monitoring Plan was rejected by EPA earlier this year. Additionally, ADEM relies on industry's self- reporting of discharges. It is no wonder that many citizens have commented on the need for more robust monitoring. • Lack of experience in dismantling and handling the amount of non-nuclear hazardous waste generated by this project.	See response to Item #9.4.

#	Comment	Response
13.2	• Risk to cultural resources – just upriver from the proposed dismantlement area is the community of Africatown which has just been placed on the World Monument Fund List. Having one more polluting industry in close proximity to this important site poses a sizeable risk to plans to develop this area for tourism.	The Africatown Historic District (an area covering approximately 921 acres; National Register of Historic Places Reference Number 12000990) is located approximately 3 miles north of downtown Mobile, Alabama, outside of the Region of Influence for cultural resources. Additionally, it should be noted that this EIS/OEIS did not identify significant impacts within the Region of Influence. As discussed in Section 3.7.3.4 (Alternative 3 [Preferred Alternative]: Commercial Dismantlement), Alternative 3 (Preferred Alternative) does not involve activities that have the potential to affect historic properties. As described in Section 2.3.4 (Alternative 3 [Preferred Alternative] – Commercial Dismantlement), waste and recyclable materials generated from the dismantlement of ex-Enterprise at the commercial dismantlement facility would be transported to an approved waste disposal or recycling facility. Waste transportation would be conducted in accordance with applicable regulations. As noted in Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management), impacts on human and environmental health and safety would be minimal. As described in Section 3.6.4.4.1 (Complete Dismantlement of ex-Enterprise), ship dismantlement and recycling activities could result in temporary minor, localized impacts on air quality. However, ship dismantling activities that comply with applicable rules and regulations would not significantly impact air quality. Mobile, Alabama, has commercial facilities with the capability to dismantle a ship of this size, and therefore, the Navy would not require new permanent facilities or facility improvements to complete the project.

C.2.5.5 K. Caton

#	Comment	Response
14.1	Modern American Recycling Services, Inc. has been in the recycling business for over 50 years in the United States with several facilities in Louisiana and deep water facility in Mobile, Alabama.	Nuclear-powered ships, such as ex-Enterprise, are highly capable Navy combatants and contain militarily sensitive information. As a result, these ships and their technologies are export controlled under the Atomic Energy Act and the Arms Export Control Act.

#	Comment	Response
	M.A.R.S. Has opened its first international facility in Denmark 3 years ago. The facility in Denmark has all of the permits and EU approvals for recycling semi submersibles, FPSO's, SHIPS, Tankers, Fixed Platforms, etc. This facility is state of the art with an ALL CONCRETE ship ramp with dimensions of 300 ft wide and 1,000 ft long. We are currently cleaning and recycling an FPSO weighing 36,000 tons and several other projects. Information about this facility can be provided upon request. M.A.R.S. Also has floating derrick barges ranging from 850 ton to 1,780 ton lift capacity that can participate in the reactor removal process. These vessels can travel to any destination for lifting of the reactors and placing them into barges for transport to storage facility. We would like to meet with officials to discuss our possibilities and thoughts and methodologies we would utilize on the safe recycling of the ex- enterprise. One Question: Once the reactors are out of the ship, can the carrier be transported to Denmark to be recycled in a state of the art EU approved facility as an option? I was in Virginia a few years ago in a meeting and proposed our facility in Mobile, AL and I believe Mobile is now a consideration.	

C.2.5.6 J. Caviness

#	Comment	Response
15.1	I agree with the Navy's solution to dismantle the hull, and dispose of the reactors of the Enterprise at their chosen facilities. It is kind of sad to see this grand ship reaching its final destination	Commenter preference acknowledged. See response to Item #12.1 and #11.1.

#	Comment	Response
	this way, and was wondering if maintaining it as a Naval museum was no longer an option.	

C.2.5.7 G. Chartrand

#	Comment	Response
16.1	So your proposal breaks an agreement with Russia on disposal on reactors. OK, I know Russia cannot be trusted but does that justify us following their lead? Hanford has spent millions to create a safe space to store these reactors and has been used for that purpose for a very long time. The site is designed to safely store the reactors in perpetuity, there is no other site that can be used thus a new one has to be created. This is a waste of millions of dollars for what?? What state is going to agree to create a nuclear waste dump for the next 10,000 years?? So now you are going to have private contractors perform the work probably at 3x the cost, create e new nuclear waste dump no one wants. Who comes up with these stupid ideas???	There are no agreements with Russia for disposal of U.S. Navy naval reactors. All nuclear fuel has been removed and is managed in accordance with federal regulations. For complete commercial dismantlement (Alternative 3 [Preferred Alternative]), the reactor plants and other low-level radioactive waste from the ship would be packaged and disposed of as low-level radioactive waste at existing authorized disposal sites in accordance with applicable local, state, and federal laws. No new disposal facilities are being proposed for Alternative 3 (Preferred Alternative). Previous U.S. Navy land-based nuclear power plant prototypes located in Connecticut and New York were decommissioned and dismantled by commercial entities. The structure and materials of these prototype nuclear power plants are the same materials used in nuclear-powered submarines and surface ships, including ex-Enterprise. In these instances, none of the dismantled reactor plant (structure or components) was sent to Department of Energy Hanford Site for burial. Following dismantlement, the content of these reactor plants was shipped to existing waste facilities for disposal, as would the content of ex-Enterprise reactor plants. Cost was one of the many factors involved in identifying Alternative 3 as the Preferred Alternative. Cost estimates included in Table 2-2 (Duration and Cost Estimate per Alternative) of this EIS/OEIS show that commercial recycling (Alternative 3 [Preferred Alternative]) could save the U.S. taxpayer approximately $406M–$844M.

C.2.5.8 Z. Cook

#	Comment	Response
17.1	How many deaths and serious injuries could be expected to recycle ex-ENTERPRISE by commercial recyclers, given the safety record of commercial ship recycling companies, when compared with the Navy's safety record in recycling ships? For example, see: https://www.referenceforbusiness.com/history2/13/International-Shipbreaking-Ltd-L-L-C.html	The Department of Labor's Bureau of Labor Statistics does not track injury data below the maritime industry level, which includes shipbreaking. Shipbreaking is a unique part of the maritime industry, primarily involving the dismantling and disposal of obsolete U.S. Navy and U.S. Department of Transportation Maritime Administration ships, as well as commercial barges and mobile offshore drilling units. Dismantling of vessels is usually conducted at a pier, dry dock, or dismantling slip and includes a wide range of activities, from removing all gear and equipment to cutting down and recycling the ship structure. The structural complexity of ships makes shipbreaking a challenging process. It involves many safety, health and environmental issues, including exposure to asbestos, toxic fumes, hazardous materials, noise, falling objects, lead and electrical shock, as well as dangers associated with heat stress, falls, heavy materials handling, and fires. These hazards exist for ship dismantlement activities involved in all of the action alternatives in this EIS/OEIS, including those conducted at commercial shipbreaking facilities and Puget Sound Naval Shipyard & Intermediate Maintenance Facility. However, the working conditions and injury rates applicable to the mid-1990s injuries of the article referenced within the comment are outdated, and consequently irrelevant to this EIS/OEIS. In an effort to reduce work-related injuries and illnesses, along with the environmental hazards associated with shipbreaking operations of government-owned ships, the Navy entered into a Memorandum of Agreement (MOA) with the Occupational Safety and Health Administration (OSHA), U.S. Department of Transportation Maritime Administration, and the Environmental Protection Agency on November 16, 1999. This MOA was renewed on July 30, 2015, and provides for a coordinated effort between the Navy, U.S. Department of Transportation Maritime Administration, OSHA and Environmental Protection Agency to use the resources of each agency to more effectively identify and regulate environmental and hazardous working conditions associated with the recycling of government-owned ships.

#	Comment	Response
		Further, OSHA has established a National Emphasis Program to reduce or eliminate workplace hazards associated with shipbreaking operations. In concert with the National Emphasis Program and in support of the MOA discussed above, OSHA is required to conduct a comprehensive safety and health inspection on all government vessels to be recycled under contract with the Navy and the U.S. Department of Transportation Maritime Administration. As a result of the efforts above, many recognized problems with past practices that led to the incidents such as those highlighted in the comment have been addressed, and continued effort in this area is being applied to further improve the process and ensure continued success. Commercial shipbreaking is an important component of the total life-cycle management of U.S. Navy vessels, and these activities will continue to support the Department of the Navy in the safe and cost-effective disposition of decommissioned ships.

C.2.5.9 G. Dela Cruz

#	Comment	Response
18.1	Hello USN, I'm considering a plan for tge ex-Enterprise to be taken to the Philippines as is for me to have it as an alternative of a carrier disposal.	See responses to Item #14.1 and Item #12.1.

C.2.5.10 R. Dickinson

#	Comment	Response
19.1	Disaster emergency response vessel. As a Nuclear Aircraft Carrier, It is a small city including an airport. Currently the ship-- Can desalinate up to 200K gallons of fresh water a day. Provide emergency medical/surgical/dental services to 6K folks 24/7. Makes 18K hot meals a day (6000 3 times a day). Can berth 6000 personnel. Hold 60 to 80 aircraft. Hanger to maintain those a/c and storage for boats and heavy equipment- With certain provisions and refits; the	See responses to Item #14.1 and Item #12.1.

#	Comment	Response
	ship could immediately provide; temporary local Government a base to operate, shelter for refugees, on scene command base, emergency & medical services. Navy Seabees can maintain & manage necessary heavy construction equipment, Emergency, search, rescue, security vehicles to set up temporary infrastructure. Immediate security infrastructure (Assisting local law enforcement) can be handled by USMC, local National Guard. Military medics first in support for search & Rescue assisting local Emergency First Responders. Ships medical department could provide Emergency triage, surgery, medical & dental services and assist local hospital get back on line. The Carriers flight deck provides capability to land many different Helo platforms. The ship can fall under US Homeland Security and manned by US Navy/ Coast Guard & Merchant Marine personnel including Reservists. During a disaster Medical personnel can be tapped from military and civilian. The ship could provide a good training platform for the sea services including Military Academies & ROTC's. Best part is this particular ship would not need to be refueled for 20 years. Yeah maybe over-kill and a helo carrier would be more economical but this is a thought. Note: How old are our hospital ships...	

C.2.5.11 C. Dreher

#	Comment	Response
20.1	International disposal in Australia for the disposal of the Enterprise is best. https://www.weforum.org/agenda/2018/11/destroying-nuclear-waste-to-create-clean-energy-it-can-be-done/ The Navy must develop nuclear propulsion systems with salt water thorium, for stealth, fast, and endurance. Thorium reactors can reduce nuclear waste and Uranium, Plutonium fuels. Thorium plants are cleaner energy for military, and civilian use. UK + US subs disposal to be at Australia. Seawolf subs to the UK. Hi DOE team,	The Navy has a responsibility to properly dispose of its inactive ships in a timely manner. Ship disposal is not discretionary. Additionally, see response to Item #12.1.

#	Comment	Response
	I am C[redacted]Dreher, a resident of Malden, MA (near Boston, MA). Right now, I am eager to participate in the discussion relative to the disposal of the USS Enterprise CVN -65. Today, I tried to access the public comments section of the website. Unfortunately, the website seems to be a dead link. Please let me know if this can be confirmed. I would really like to participate in the public forum on September 20 and 22. The topic of Ship Recycling Programs and scrapping is an important one for the United States and the United Kingdom. Currently, both the United States and the United Kingdom are burdened with the significant challenge of dealing with the decommissioned nuclear vessels. The US has the task of both determining, and completing the decommissioning of its nuclear powered Nimitz-class carriers, as well as the Los Angeles attack-class and Ohio ballistic missile-class submarine boats. The United Kingdom is faced with similar daunting dilemmas regarding its own attack class and ballistic missile class submarines. To note, the government of Australia is seeking to replace its Collins attack-class submarines as well. The Australian government is seeking to upgrade its submarine fleet to nuclear powered vessels to offset the growing naval threat that China poses in the South Pacific. I recommend considering an arrangement with the Australian government to the effect of the discussion regarding the safe, and secure disposal of the 20 nuclear submarines from the UK, and the 20 nuclear submarines from the US. The proposed arrangement between the Australian-UK-US governments as part of the partnership between all three nations, would be that the Australian government would be tasked with the recycling of the 40 total nuclear submarines of the UK and US- in exchange for selling the 3 Seawolf-class boats to the UK government. The UK is best to receive the 3 Seawolf-class submarines as their entire attack-class fleet consists of only 5 boats currently.	

#	Comment	Response
	The 40 submarines between both the UK and the US are ideally scrapped in Australia, as the Macdonnell and Muskgrave Ranges are superb for receiving the decommissioned waste. The non-radioactive material can be recycled for the production of new Australian navy vessels. Furthermore, it is recommended that Australia be advised to purchase Invincible-class submarines that more closely mirror the current specifications and characteristics of the Collins-class submarines. The success and evaluation of Australian naval activity with regard to the 40 decommissioned nuclear submarines would be essential proving for the exploration of nuclear submarine programs for Australia. I firmly recommend doing this proposal as it is an immensely beneficial observational program for future Australian naval programs. The Australian government would be generously compensated for the nuclear ship recycling of the 40 decommissioned nuclear vessels. To augment the desire for a bolstered naval presence in Australia, it could also be beneficial to consider sale of several conventionally powered surface vessels from the United States inventory. The decision is important, as the Chinese navy is becoming ever more present, and posturing in the South Pacific. Please acknowledge this email, as read, reviewed, and also do respond to it, (thanks!). I am recommending these arrangements for the United States, the United Kingdom, Australia, and Germany. It is essential for the United States and the United Kingdom recycle their decommissioned submarines, Australia gain experience with nuclear operations while replacing its conventional attack-class submarines. The proposed arrangement is decisively enormous, in endeavor and cost; yet, the resolution of all four countries' submarine fleet concerns would most optimally be met. I would greatly appreciate a thoughtful reply and considerate conversation regarding my suggestions, as the futures of nuclear naval fleets is directly in question- due to the significant topic of ship recycling, in particular concern about nuclear waste and contamination. Thank you for your	

#	Comment	Response
	read, review, and response to my message. I look forward to your dedicated reply. The Enterprise is not optimally disposed in the US. The Puget Sound Navy yards need to be allocated for new ship production. Two additional ports are optimal for Navy yards and bases: Eureka, CA, USA Coos Bay, OR, USA	

C.2.5.12 J. Ernst

#	Comment	Response
21.1	I believe this ship would make a great research facility for future propulsion and clean energy projects, among many other projects that could be hosted in a movable, floating city, with an airport. It could be host to many entitie such as the Navel Research Labs, NASA, etc. Funding could come from many different agencies, some permanent, some rotating, and some ad-hoc. Or you could operate it like an international space station, welcoming a community of science experiments. New methods of fire fighting and rescue could be developed there. Environmentally clean methods of ship operations and even ocean cleanup are desperately needed. Special ops training could take place there. The first sustainable cold fusion reactor could be proven there. New nuclear fission technologies could be developed and proven there. I could probably go on and on and still never guess what it would actually be used for. Never the less, it's a National icon of American ingenuity and could make us even more proud in the years to come. Plus you could host Star Trek conventions for some extra cash each year; if you use it to advance humanity in a moral and ethical way.	See response to Item #12.1.

C.2.5.13 M. Flie

#	Comment	Response
22.1	Dear US Navy/ CNC	See response to Item #12.1.

#	Comment	Response
	I have submitted several ideas to the Navy and to the President in regard to the future of the USS Enterprise CVN 65. I believe that it's history, its service record and the financial logistics surrounding it merits saving the Enterprise rather than scrapping it. Do a minor fix up of the carrier and restore her back to its original appearance. Turn her into a Recruiting/PR vessel. Its duty will be to your the entire United States year-round. Going port to port and working in conjunction with each local recruiting office. The Enterprise will be open to the general public for people of all ages to view the carrier. Maybe a minor tour of a couple of key areas of the vessel and maybe some demonstrations of planes and helicopters taking off from the carrier. This would be a great value to the Navy as a Recruiting vessel for the Navy and promote a positive connection with the military rather than turning this historic vessel into soup cans. Think about it…	

C.2.5.14 S. Gauss

#	Comment	Response
23.1	I believe the first option is both the most economically prudent as well as historically so. To spend billions to destroy this ship is wasteful in the extreme. Additionally, technology will undoubtedly advance to the point where she could be repurposed as a museum ship in the future. Scrapping cannot be undone once started.	Commenter preference acknowledged.

C.2.5.15 P. Gray

#	Comment	Response
24.1	Please continue to use the approved methods for transport to the Hanford Environmental Restoration Site.	Commenter preference acknowledged.

#	Comment	Response
	The Hanford Site has set a superior standard for receiving and proper handling and storing of the reactor compartments for many years The Alternate methods 1 and 2 should also be used for the proper disposal of the reactor compartments.	

C.2.5.16 J. Haffner

#	Comment	Response
25.1	Please bring Enterprise to Mobile! We will honor and cherish her.	Commenter preference acknowledged. If the Record of Decision selects Alternative 3 (Preferred Alternative), the final commercial location would be determined through a competitive bidding process following the completion of this EIS/OEIS.

C.2.5.17 M. Hawthorne

#	Comment	Response
26.1	The Navy can completely avoid decommissioning issues and bolster deterrence of China by offering the Enterprise to India -- which has civilian and military nuclear expertise, to replace the reactors Funding along with the Enterprise of 500 million along with technical support could be offered. This would offset the potential advantage of China having a 2 to 1 advantage of ski jump carriers, along with a further advantage of its newest diesel flat top fitted with electromagnetic launchers, against India's single ski jump carrier that has a smaller displacement than China's two Soviet carriers. China would then be hemmed in by two Navies with a nuclear carrier capability. It would be both a strategic move to hem in China and a cost saving measure saving hundreds of millions of dollars by shifting the ultimate decommissioning responsibility to India.	See responses to Item #12.1 and Item #14.1.

C.2.5.18 G. Hillesland

#	Comment	Response
27.1	Will financial information be provided? What will the price be to the commercial enterprise for the breaking of this ship? What are the gross and net profits expected for the commercial enterprise? Will compensation of officers of the commercial enterprise be presented?	This EIS/OEIS presents cost estimates for the purposes of guiding a comparison between alternatives. The cost estimates per alternative are presented in Chapter 2 (Description of Proposed Action and Alternatives) of this EIS/OEIS. Additionally, the cost estimate document was posted to the ex-Enterprise EIS/OEIS website (https://www.carrierdisposaleis.com) on September 26, 2022. Financial contractual information is outside the scope of this EIS/OEIS, and specific profits and compensation figures are unknown because the contractor will not be selected until after the EIS/OEIS process is complete.

C.2.5.19 S. Kelly

#	Comment	Response
28.1	I disagree that alternative 3 should be the preferred method. Yes, private shipyards are dismantling ex CVs and other commercial power plants, these were not nuclear powered vessels. The public shipyards (PSNS) has a specialized workforce than can dismantle the ex-Enterprise ship in the safest possible manner. Alternative 3 is lower in total dollar cost, however the total radiation exposure is about 80% higher than the other alternatives. With the understanding that any radiation exposure has some health risks associated with it. The final overall outcome using Alternative 3 will be a higher fatality rate. The human cost that can't be converted to dollars, as a human life is priceless. So why expose a workforce to higher total exposure? PSNS has demonstrated 138 times that they can safely and with lower exposures dismantle/dispose of reactor compartments. The workforce is highly trained in NNPP methods and dedicated to supporting the Navy's needs. While the private sector has little or no experience dismantling Navy nuclear powered vessels. This	Commenter preference acknowledged. All action alternatives analyzed in this EIS/OEIS are within the capabilities of existing public or commercial shipyards and nuclear services companies. The dismantlement approaches for all action alternatives, including dismantlement of the entire ship (including its reactor plants) at a commercial facility, support disposal in a manner protective of human health and the environment. Currently, complete dismantlement and recycling of the entire ex-Enterprise at Puget Sound Naval Shipyard & Intermediate Maintenance Facility would not be an effective use of the limited resources available, detracting from the shipyard's ability to complete the highest priority fleet maintenance work. Further, the Navy has no plans to qualify another public shipyard for this work. Therefore, analysis of full ship dismantlement in this EIS/OEIS considered for commercial facilities only. Further, total exposure estimates reported in this EIS/OEIS for all action alternatives are approximate and are provided for planning and comparison

#	Comment	Response
	increases the possibility of unforeseen events that can and will increase the overall cost of disposal. Also an unwanted event will reflect poorly on the public's opinion of the Navy's nuclear propulsion program. This public opinion is very important to the viability of the program as a whole. Without it, the program could be shutdown. Alternative 3 generates a considerable additional amount of LLRW compared to the other 2 alternatives. This is not good for the environment overall and storage space is limited. Yes, it will be stored correctly at a storage location, however this waste will be around way longer than anyone making the decision of who is going to dismantle the ex-Enterprise. We owe it to our future generations to make the best possible decisions for what is best for the environment even if at the moment it has a higher cost. The anticipated growth in PSNS workload is only an educated guess and may not actually occur. The Navy has done an outstanding job of load leveling PSNS workload over the years. I have full confidence that PSNS can be able to work through the workload issues while still supporting the Navy's needs. Alternative 1 is the best option for our country. Thank you for taking the time to read my option.	purposes only. Exposure estimates for the dismantlement approaches for all three action alternatives are comparably low and based on executing dismantlement and disposal in a manner protective of human health and the environment. While any exposure to ionizing radiation carries some risk, exposures within federal limits are considered safe. 10 CFR Part 20, Standards for Protection Against Radiation, specifies a federal radiation total effective dose equivalent exposure limit of 5 rem per year to workers. All work would be planned and executed in a manner to keep worker dose ALARA – As Low As Reasonably Achievable and consistent with federal regulations. Most commercial dismantlement workers receive no more than 2 rem per year, or 40 percent of the allowable federal limit. The Navy and commercial nuclear industry have decades of experience demonstrating safe and environmentally sound handling and disposal of nuclear reactor plants, including hazardous materials. At commercial dismantlement sites, the Navy would ensure that protection of workers and the public meets federal standards. A commercial vendor would be subject to all applicable local, state, and federal environmental standards during dismantlement of ex-Enterprise. Further, a robust radiological monitoring program would be established to ensure that there is no adverse effect on the health of contractor personnel, the public, or the environment in the vicinity of the commercial facility. For each of the alternatives, radioactive waste packaging and shipping would meet applicable state and federal regulatory requirements. For commercial dismantlement, the reactor compartments would be disassembled and the reactor plant components would be disposed of as low-level radioactive waste at a licensed commercial or Government facility. All other non-radiological waste would be disposed of at appropriate licensed and available locations. Regardless of the alternative chosen, the Navy employs all necessary precautions to protect the public and the environment when dismantling ships and when transporting and disposing of nuclear propulsion plants.

C.2.5.20 K. Koemmpel

#	Comment	Response
29.1	Does selection of alt. 3 set precidence for CVN 68 class to do commercial complete dismantlement?	Lessons learned from ex-Enterprise disposal will inform Navy decisions on future nuclear-powered ship disposals, including Nimitz Class.
29.2	after "… Navy & DOE, 1984)…" add here after referred to as the 1984 EIS."	The Navy revised this EIS/OEIS to add an abbreviated reference to the 1984 EIS.
29.3	Statement is misleading "This process would not require substantial changes to the infrastructure at PSNS & IMF". What is substantial? Through out the EIS the Port of Benton mods and Handford site mods are addressed, but the EIS does not address required PSNS&IMF DD-4 modification to safely address PSS docking (guiding dolphins and guide system in dry dock). Does the EIS assume for alts. 1 and 2, CVN 65 RCD will be accomplished in DD-6? Using DD-6 has the most impact on Pacific Fleet maintenance vice DD-4. If DD-4 is to be used for alts. 1 and 2 add the impacts of DD-4 modifications including in water work to install guide dolphins.	The current docking plan for the propulsion space section at Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) utilizes Dry Dock 4 but does not include in-water work. Only temporary structures (dry dock fenders and caisson seat protection) would be needed to support the dry docking and subsequent reactor compartment packaging. The minor work to install temporary structures to Dry Dock 4 has negligible environmental impacts and does not need to be separately analyzed in this EIS/OEIS.
29.4	"...successful ongoing commercial nuclear power plant decommissioning (by contract with nuclear services companies.)" Commercial plants are significantly different from Naval reactor plants. Zion commercial plant is used as an example for comparison. Zion had 2 reactor plants, containment buidings are steel reinforced concrete. CVN 65 has 8 reactor plants with steel reinforced, double bulkhead, shielded reactor compartments. Activated/contamintated structure is nowhere addressed in the draft EIS.	The commercial nuclear services industry has a track record of safely performing nuclear dismantlement work, such as the Army STURGIS barge and commercial nuclear power plant dismantlement. Eleven U.S. commercial nuclear power plants, including the Zion commercial power plant, have been decommissioned, deconstructed, and the associated sites returned to unrestricted reuse status. Delineation of the “unrestricted reuse” term indicates the site is safe for reuse for purposes such as housing, farming, or industrial use. In addition, four previous U. S. Navy nuclear power plant prototypes were decommissioned and deconstructed, with one of these sites, in Windsor, Connecticut (S1C), returned to unrestricted reuse status in 2017. The structure and materials of these prototype nuclear power plants are the same materials used in nuclear-powered submarines and surface ships, including ex-Enterprise (DOE, 2006).

#	Comment	Response
		The commercial nuclear services industry uses established methods for identifying and properly controlling activated structure, including structures with contaminated surfaces. Activated structure is typically located within the confines of a shielded containment building or compartment and controlled for disposal. Structures with contaminated surfaces may exist outside of a shielded containment building or compartment. Investigative survey processes, such as those described in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), and a review of site historical use are considered to determine the extent of potentially contaminated surfaces. The MARSSIM provides information on planning, conducting, evaluating, and documenting building surface and surface soil final status radiological surveys for demonstrating compliance with dose or risk-based regulations or standards. The MARSSIM is a multi-agency consensus document that was developed collaboratively by four federal agencies having authority and control over radioactive materials: Department of Defense, Department of Energy (DOE), Environmental Protection Agency, and Nuclear Regulatory Commission (NRC). The MARSSIM's objective is to describe a consistent approach for planning, performing, and assessing building surface and surface soil final status surveys to meet established dose or risk-based release criteria, while at the same time encouraging an effective use of resources (NRC, 2000). Activated structure and components are controlled and disposed of as radioactive material. Structures and components with contaminated surfaces are controlled and properly disposed of or controlled until contaminated surfaces are remediated. Contaminated components of the ex-Enterprise are described in Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management) of this EIS/OEIS. Dismantlement of reactor compartment bulkheads, shielding, structures and components were included in cost, person-hours, exposure estimates, and waste disposal volume estimates. Commercial radiological services companies have a demonstrated record of safe disposal of defueled nuclear power plants comparable in volume and complexity with ex-Enterprise.

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29.5	EIS states "successful dismantlement of a U.S. Army Barge (STURGIS) contained a defueled nuclear reactor…" The STURGIS reactor plant was shut down for 39 years before it was dismantled. It operated for 8 years and was a small reactor, 10 MW. Also contained one loop (one SG). Not set up as a warship with battle hardening. Please explain the proprotionality of this comparison.	Regarding the experience of commercial radiological services industry dismantling nuclear power plants, see response to Item #29.4. Commercial radiological services companies have a demonstrated record of safe disposal of defueled nuclear power plants comparable in volume and complexity with ex-Enterprise. This EIS/OEIS references the STURGIS project to give a recent example of National Environmental Policy Act documentation covering a similar project and a similar regulatory structure. The STURGIS example was presented as a proof of concept, not a comparison of scale.
29.6	CEQ should be spelled out first use "Council of Environment Quality (CEQ)"	In both the Draft and Final EIS/OEIS, Council on Environmental Quality is defined upon its first use in Section ES.2 (Introduction).
29.7	Alt. 3. This summary does not address added impacts and risks of commercial dismantlement. These include: 1) increased cumulative radiological exposure to workers, increased radiological waste, increased radiological shipments, increased risk of open disassembly of 8 reactor compartment that create increased risk of spread of radioactivity from possible fire, and tropical storms etc. Please address.	The Executive Summary is meant to provide a high-level summary of impacts. Section 3.1 (Public and Occupational Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management) provide the detailed analysis for radiological risks from commercial dismantlement. Radiological work procedures are designed to minimize both the likelihood of an accident and the consequences of an accident, should one occur. Emergency plans and procedures would remain in place to protect health and safety (see Section 3.1.3.4.2 [Complete Dismantlement of ex-Enterprise at Commercial Facility {Includes In-Water Work}]). For Alternative 3 (Preferred Alternative), the Navy envisions this work would be conducted in accordance with NRC requirements. As an example of Alternative 3 (Preferred Alternative) commercial dismantlement, the Surface Ship Support Barge (SSSB) dismantlement radiological services contractor implemented use of NRC requirements by conducting radiological work within a negatively ventilated barge structure or a temporary containment structure, both of which were engineered and maintained to withstand adverse weather impacts. For Alternatives 1 and 2 (the reactor compartment packaging alternatives), the work would be conducted according to Naval Nuclear Propulsion Program (NNPP) requirements. Both NRC and NNPP requirements control radioactivity such that the risk presented for possible releases to the environment or by

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		the occupational radiation exposure is small and within all applicable limits for protection of human health and the environment. The estimated radiation exposure and work hours for Alternative 3 (Preferred Alternative) include the effort needed to disassemble the reactor plants and structure, as described in Chapter 2 (Description of Proposed Action and Alternatives) and Section 3.1 (Public and Occupational Health and Safety) of the Draft EIS/OEIS. Additionally, for perspective, between calendar year (CY) 2020 and CY 2022, a radiological services contractor completed size reduction and disposal of the Navy D1G prototype secondary and primary shielding structures. The contractor work hours, personnel exposure (adjusted for decay), and cost to perform the work are similar to those estimated for Alternative 3 (Preferred Alternative). For Navy ships and facilities, the Unified Facilities Criteria (UFC) governs mooring under several conditions, including heavy weather events. For example, a ship that cannot move out to sea before a storm, like ex-Enterprise, could have its standard mooring lines increased and also run across the pier to make it significantly more difficult for weather to break the ship loose. The Navy would include these criteria, or equivalent, as applicable in requirements in any dismantlement contract. The UFC are publicly available at www.wbdg.org.
29.8	If Newport News Shipyard (NNS) is awarded the contract for complete dismantlement of Ex-Enterprise there would be impacts to Fleet maintenance as NNS accomplishes CVN construction and CVN refueling overhauls, in addition to construction of submarines. Please addresses this concern when discussing fleet maintenance impacts in the EIS.	The action alternatives include towing ex-Enterprise from Newport News to an authorized commercial dismantlement facility in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama, and contracting the partial or complete dismantlement of the ship by an authorized ship dismantlement contractor. Impacts on fleet maintenance workload would be dependent on location ultimately selected by the contracting process, which is outside the scope of this EIS/OEIS.
29.9	Why is the Navy willing to use NRC exposure requirements that result in higher exposure to the individual workers? There is no comparison in the draft EIS of radiolgical exposure risk as compared to the need for PSNS&IMF to accomplish fleet maintenance.	The Navy and the commercial industry adhere to the same Federal radiation total effective dose equivalent exposure limit of 5 Roentgen equivalent man (rem) per year, and the radiation control programs are consistent with the principles identified in “Occupational Radiation Exposure From U.S. Naval

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		Nuclear Propulsion Plants and Their Support Facilities ” (NNPP, 2022). The estimate associated with occupational radiation exposure for Alternative 3 (Preferred Alternative) was calculated estimating an average exposure rate (1 millirem per hour) combined with the total person-hours estimated for the work. This approach is discussed in Section 3.1.3.4 (Alternative 3 [Preferred Alternative]: Commercial Dismantlement). The occupational exposure for Alternatives 1 and 2 (the reactor compartment packaging alternatives) are based on detailed records from actual Navy dismantlement projects. Occupational exposure under all action alternatives is within federal requirements and accepted occupational risk values. Additionally, both commercial radiological services companies and the Navy apply the “as low as reasonably achievable” (ALARA) principle to engineer the work such that worker exposure to radiation is further reduced below applicable limits. PSNS & IMF work load is presented in Figure 2-21 (PSNS & IMF Workload FY23–FY37). Comparison of costs and radiological exposure for all alternatives is presented in Table ES-2 (Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 [Preferred Alternative]).
29.10	The Navy should consider and evaluate mitigating impacts to the PSNS&IMF work force by contracting commercial companies to perform dismantle/RCD work at PSNS&IMF or other Pacific Northwest locations (Portland). Naval contractors perform work in Portland in floating dry docks and is located along the RCD shipping route on the Columbia River. This could address work load issues and perfrom the lowest cost, lowest radiological exposure/risk option. Analize this option in the EIS.	This EIS/OEIS does not dictate the location the work would occur under Alternative 3 (Preferred Alternative). During the scoping period, the Navy evaluated all reasonable proposed alternatives and locations that demonstrated an interest and the necessary capability, including the Portland, Oregon, area. Several industry events were held to gauge the capabilities and willingness of the shipbreaking industry to dismantle ex-Enterprise. The information gathered during these events helped inform the alternatives in this EIS/OEIS. No companies in the Pacific Northwest expressed interest at the time. The Navy has identified Alternative 3 – Commercial Dismantlement as its preferred alternative because it would keep the specially qualified and trained PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivation and reactor compartment package work that are already part of the PSNS & IMF workload, provide cost benefits to the U.S.

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		taxpayer, would not result in significant environmental impacts, and is based on the workforce protective application of radiological controls and ALARA consistent with Navy principles discussed in "Occupational Radiation Exposure From U.S. Naval Nuclear Propulsion Plants and Their Support Facilities" (NNPP, 2022). The preferred alternative does not result in a decrease in the PSNS & IMF workforce. Under the DOE Settlement Agreement with the State of Washington dated Jan. 6, 2006, only "naval reactor compartments, reactor core barrels, reactor closure heads, and pumps from Puget Sound Navy Shipyard or Pearl Harbor Naval Shipyard that may contain LLW or MLLW" are permitted to be disposed of at the DOE Hanford Site. This prevents the DOE Hanford Site from accepting reactor compartment packages or the bulk of the reactor plant generated from other locations. This EIS/OEIS does not revisit the results of this settlement.
29.11	The Navy should consider an option to perform Alternative 1 or 2 by utilizing commercial contractors in the Portland, OR area. Performing shipbreaking/RCD in a commercial facility in the lower Columbia River has many advantages. 1. No need to construct the Propulsion Space Section (PSS) Cost and time savings, 2. No need to perform heavy lift and transport of the PSS to PSNS&IMF Cost and time savings, 3. LLRW shipment process was proven during the dismantlement of the Trojan Nuclear Power Plant (2005) near Portland, OR., 4. It eliminates the need to use facilities and personnel engaged in fleet maintenance at PSNS&IMF and NNS, 5. Elimination of the open ocean tow of Reactor Compartment Disposal Packages from PSNS&IMF to the Columbia River will significantly reduce the construction requirements for Type B packaging, and 6. Radiological dose and hazardous material exposure and disposal would be considerably lower than Alternative 3. The Navy should address this alternative in this EIS for CVN 65.	Regarding other potential locations to analyze, see response to Item #29.10. Additionally, Type B package construction requirements are codified in 10 CFR Part 71.73 (Hypothetical accident conditions), and these requirements for package design and construction apply regardless of the physical parameters of the actual transport route.

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29.12	Spell out ICRP "International Commission on Radiological Protection (IRCP)"	The EIS/OEIS has been updated to spell out International Commission on Radiological Protection.
29.13	This summary should state clearly total exposure for all alts.s. Saying 300 rem over 5 years for both Alts.s 1 and 2 is misleading. If 8 single RCD packages results in 300 rem of exposure then 4 dual packages would be substatially less. Dual packages eliminate removal of the common RC bulkhead between RCs A and RCs B. Also the RCs will not be required to be open to the environment. Please address these issues in the EIS.	The exposure estimates provided are within acceptable uncertainties, are bounding, and are intended for a basis of comparison. As stated in this EIS/OEIS, occupational radiation exposure under all action alternatives would be low and within accepted occupational risk values. Work for all alternatives will also apply ALARA to further reduce overall worker exposure. Separation of the compartment bulkheads would require extra effort for Alternative 1. This would result in a nominal increase in exposure and is bounded by the estimate provided. This is cited in Section 3.1.3.3.4 (Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Four Dual Reactor Compartment Packages [No In-Water Work]).
29.14	"The estimate for reactor compartment packages is based on scaling radiological exposure data for nuclear cruiser reactor compartment packaging and is expected to be conservative and bounding." This is not a true assumption for single RCD packaging because the RC A/B common bulkhead must be removed and is extensive radiolgical work. Requires removing PRZ and CPIX and the common bulkhead. Please address as a difference between alts 1 and 2.	Potential impacts on public and occupational health and safety from dismantlement activities are minimal for all alternatives analyzed. Radiological work would be carefully engineered to validate the radiological conditions are as expected. Additionally, for all alternatives, a robust radiological monitoring program would be established to ensure that there is no adverse effect on the health of contractor personnel, the public, or the environment in the vicinity of the dismantlement location. As described in Section 3.1.3.4 (Alternative 3 [Preferred Alternative]: Commercial Dismantlement), radiation exposure and cost estimates accounted for disassembly of the bulkheads, transportation, and disposal. Additionally, for perspective, Navy D1G prototype dismantlement work was recently completed by a commercial contractor using modern large-scale techniques. Shielding and bulkhead removal was completed on a per-ton basis for approximately half the person-hours, one-third or less of the total cost (removal, transportation, and disposal) per ton, and less than one-tenth of the exposure estimated in the Navy's 1996 EIS, using then-existing dismantlement and disposal techniques, and is similar to the cost and dose estimated for Alternative 3 (Preferred Alternative). Multiple lead disposal and recycling options and proven industry dismantlement cutting and shipping methods have improved the effectiveness of this work.

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29.15	The radiological exposure estimate (540 rem) for alt. 3 complete disassembly is low. If 8 single packages require 300 rem by just basic factors, alt. 3 should require at least 3300 rem. Each RC has 6 sides that require disassembly (minus 4 for common bulkheads) for a total of 44 RC sides under alt.3. For alt. 1 there are 4 common bulkheads that require disassembly. So alt. 3 has 11 times more bulkhead removal. Simple math results in 300 X 11 = 3300 rem for alt. 3. Even if this method is not exact the 540 rem number is clearly low and not realistic. Please reassess the exposure estimated for all alternatives.	Potential impacts on public and occupational health and safety from dismantlement activities are minimal for all alternatives analyzed. Radiological work would be carefully engineered to validate the radiological conditions are as expected. Additionally, for all alternatives, a robust radiological monitoring program would be established to ensure that there is no adverse effect on the health of contractor personnel, the public, or the environment in the vicinity of the dismantlement location. As described in Section 3.1.3.4 (Alternative 3 [Preferred Alternative]: Commercial Dismantlement), radiation exposure and cost estimates accounted for disassembly of the bulkheads, transportation, and disposal. Additionally, for perspective, Navy D1G prototype dismantlement work was recently completed by a commercial contractor using modern large-scale techniques. Shielding and bulkhead removal was completed on a per-ton basis for approximately half the person-hours, one-third or less of the total cost (removal, transportation, and disposal) per ton, and less than one-tenth of the exposure estimated in the Navy's 1996 EIS, using then-existing dismantlement and disposal techniques, and is consistent with or bounded by the cost and dose estimated for Alternative 3 (Preferred Alternative). Multiple lead disposal and recycling options and proven industry dismantlement cutting and shipping methods have improved the effectiveness of this work.
29.16	Alt. 1 cost. Provide the actual cost eatimate. The shipyard has this number and should be shown for a faircomparison.	The cost estimates provided in Table ES-2 (Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 [Preferred Alternative]) are an accurate comparison for the purposes of this EIS/OEIS. Table ES-2 (Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 [Preferred Alternative]) shows that Alternative 1 would be more expensive than Alternative 2 due to the added bulkhead separations. Additionally, the cost estimate document for Alternative 3 (Commercial Dismantlement) was posted to the ex-Enterprise EIS/OEIS website (https://www.carrierdisposaleis.com) on September 26, 2022.

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29.17	RAR 4 is not addressed as a cost/exposure and will be a significant cost for alt. 1, 2 and 3. Please address.	Specific details of work sequencing and nuclear propulsion plant spaces are outside the scope of this EIS/OEIS. While the Navy can confirm that Reactor Auxiliary Room 4 does not have significant radiological concerns, any areas of special radiological consideration are well documented and will be appropriately handled during dismantlement and disposal in accordance with all applicable requirements for protection of human health and the environment. This EIS/OEIS's cost, exposure, and waste estimates included consideration of necessary work in all spaces.
29.18	Alt. 3, 440 CONEX boxes seems low and is not obvious what is included. Shipments will include reactor plant components and contaminated/activated structure. Also all RCs insulation (systems and bulkhead) are asbestos and much of it is radiologically contaminated. There are 28 RC bulkheads, 8 RC tops, and 8 bottom hull sections for a total of 44 sections. Each section is about 36 feet square. There is 57,000 SF (44 sides X 36x36 SF). Each section would need to be cut in to 6 FT X 18 FT pieces to fit in a 20 R26:S26FT CONEX or 528 pieces. If you stack 4 pieces in each CONEX thats 132 CONEX. Is this how the estimate was done? Does the EIS assume that most of the RC bulk heads can be realased from radiological controls and disposed of as recycle material? Please address in the EIS.	The waste estimates presented in this EIS/OEIS included consideration of all necessary work, including bulkheads. Calculations can be found in the Final EIS/OEIS in Section 2.3.4.1 (Complete Dismantlement of ex-Enterprise at a Commercial Dismantlement Facility).
29.19	Alt. 3, "Required Infrastructure Improvements". Saying infrastructure improvements are not required for alt. 3 is not accurate. If complete commercial dismantlement is accomplished at Newport News they have the general required radiological facilities. If alt. 3 is accomplished in Alabama or Texas some radiological material processing facilities will be required.	Per the screening criteria in Chapter 2 (Description of Proposed Action and Alternatives), "the location or facility [must] ... have no limitations for work with radioactive material that would prevent removal of radioactive material from ex-Enterprise and shipping low-level radioactive waste (LLRW) and low-level mixed waste to an existing waste facility." While infrastructure improvements are not required, a contractor would not be prohibited from undertaking improvements to their facilities. However, since the selected contractor could utilize strategies including shipboard waste processing or placement of temporary processing facilities, Alternative 3 (Preferred Alternative) does not require infrastructure improvement. The Navy envisions contractually invoking NRC requirements. Under this approach, these

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		strategies and procedures would be provided in dismantlement work plans and reviewed and approved by NRC and Navy.
29.20	Dismantlement has begun at the Alabama Shipyard of the Navy decommissioned Surface Ship Support Barge. The dismantlement is a joint venture between APTIM Federal Services, LLC and Alabama Shipyard. The project is expected to be complete in 2024 and budgeted at $129 million. (Information from Table 4-1, pge 4-10). Has the Alabama shipyard created radiological processing facilities? Address the need for radiological processing facilities for alt. 3.	For the SSSB dismantlement project, the contractor-developed Decommissioning Work Plan included strategies to dismantle the radiologically controlled portions of the facility and package the components either within the hull of the SSSB, or within a large, adverse-weather-rated, soft-sided containment structure. Dismantlement and packaging of radiologically controlled structures and equipment within these locations supports conducting the work using negative pressure filtered ventilation to ensure no impact on human health and the environment. A staging area for waste packaged in accordance with federal and state regulations for transportation is staged within the secure area established to support the dismantlement and control access to the project. The temporary containment structure and work site, upon project completion, will be released for unrestricted use. See response to Item #29.19.
29.21	Alts. 1 and 2 both require infrastructure with mods to DD-4 at PSNS&IMF. Please add.	See response to Item #29.3.
29.22	It should be made clear in the EIS that alt. 3 has radiological risks thousands of times greater than alt. 1 and 2. Does the risk assessments include risk of spread of radioactivity by fire or tropical storm? Disassembly of Naval reactor plants is significantly more complicated than commercial plant disassembly.	The impacts on public and occupational health and safety would be minimal for all alternatives. For Navy ships and facilities, the UFC governs mooring under several conditions, including heavy weather events. For example, a ship that cannot move out to sea before a storm, like ex-Enterprise, could have its standard mooring lines increased and also run across the pier to make it significantly more difficult for weather to break the ship loose. The Navy would include these criteria, or equivalent, as applicable in requirements in the dismantlement contract. The UFC are publicly available at www.wbdg.org. Regarding emergency response, see response to Item #29.7.

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		Additionally, as discussed in this EIS/OEIS, the Navy envisions partnering with the NRC to provide technical support and inspection services for the work. The Navy, via review and approval of contractor procedures, will ensure necessary outreach, cooperative training, and preparations are completed with local and state responders and regulators. The outreach and communications, as well as response preparations, would be maintained for the duration of the project, ensuring necessary readiness and capability to respond to problems in the unlikely event they occur. For additional perspective, the inactivation process removed significant hazards and combustibles from the ship, greatly reducing the risk of fire and over 99 percent of the remaining radioactivity onboard the vessel is fixed within metals, making a significant spread of radioactivity unlikely. Finally, the Navy has successfully dismantled four prototype reactor plants. These plants included robust shipboard construction and were dismantled safely without impact on public health or quality of the environment, with exposure returns commensurate with those presented for Alternative 3 (Preferred Alternative). The work was complete disassembly, similar to Alternative 3 (Preferred Alternative), and was completed by contracted private shipyard or radiological services contractors using dismantlement techniques from private industry. See answers to Items #29.4 and #29.5 for comparison of nuclear industry and ship dismantlement work.
29.23	Hazardous and Radioactive Waste Management (Section 3.2) Hazardous waste estimates are the same for alt. 1 and alt. 2. This is not true. Alt. 2 will have less hazardous waste due to not separating the A/B RCs. Provide accurate estimates.	Hazardous waste volumes would be functionally equivalent under Alternatives 1 and 2 (the reactor compartment packaging alternatives) and are for the entire ship. Additionally, differences in waste generation between the reactor compartment packaging alternatives would have negligible impact on the overall waste total as the amount of hazardous waste generated from propulsion plant work under all action alternatives is small compared with the total ship hazardous waste. The relatively minor differences in hazardous waste generation for the reactor compartment packaging alternatives would have a negligible effect on environmental impacts.

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29.24	Hazardous and Radioactive Waste Management (Section 3.2) Non-Hazardous waste estimates are the same for alt. 1 and alt. 2. This is not true. Alt. 2 will have less non-hazardous waste due to not separating the A/B RCs. Provide accurate estimates.	Non-hazardous waste volumes are functionally equivalent under Alternatives 1 and 2 (the reactor compartment packaging alternatives). Differences in waste generation between the reactor compartment packaging alternatives would have negligible impact on the overall waste total as the amount of hazardous waste generated from propulsion plant work under all action alternatives is small compared with the total ship hazardous waste. The relatively minor differences in non-hazardous waste generation for the reactor compartment packaging alternatives have negligible effect on environmental impacts.
29.25	Hazardous and Radioactive Waste Management (Section 3.2) Radiological waste quantity estimates are not provided and are not the same for alt. 1 and alt. 2. Alt. 2 will have less radiological waste due to not separating the A/B RCs. Provide accurate estimates.	Radiological waste totals are functionally equivalent under Alternatives 1 and 2 (the reactor compartment packaging alternatives). The waste disposal location would be different for the amount of radiological waste generated outside of the reactor compartment packages; however, the difference has negligible effect on environmental impacts.
29.26	Biological Resources (Section 3.5). In-water hull cleaning prior to tow from Hampton Roads area. Is hull cleaning allowed in the Hampton Roads area? Ex-Kitty Hawk (CV 64) required to be dry docked for hull cleaning before tow from Bremerton, WA to Brownsville, TX (Jan 2022)	Hull cleaning would only occur in the Hampton Roads Metropolitan Area, Virginia. Hull cleaning would only occur in water if dry dock hull cleaning was not practical. If the Navy determines that dry docking is not practical, the Navy would comply with all applicable laws for in-water hull cleaning (as specified in 40 CFR Part 1700 37[b][3][iv]), technical guidance on hull cleaning methods described in detail in the Naval Ships' Technical Manual Chapter 081 (Waterborne Underwater Hull Cleaning of Navy Ships), and site-specific agreements with National Marine Fisheries Service Office of Protected Resources (as specified in Appendix D [Consultation Correspondence] in the National Marine Fisheries Service letter of concurrence for Alternative 3 (Preferred Alternative).
29.27	Note 3. LLRW shipments are not equal for all the alts.s. Alt. 2 has the fewest shipments, then alt. 1 and alt. 3 has significantly more shipments. The table and note should reflect accurate estimates for comparison.	Table ES-2 (Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 [Preferred Alternative]) compares the amount of waste from each alternative generated due to package construction or dismantlement of the reactor plants. Note 3 refers to the additional LLRW shipments other than what is accounted for in Table ES-2 (Summary of Environmental Impacts for the No Action Alternative, Alternative

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		1, Alternative 2, and Alternative 3 [Preferred Alternative]); these amounts are equivalent between the three action alternatives. The executive summary and Appendix E (Radiological Evaluation of Reactor Plant Disposal Alternatives) address the differences resulting from the number of radioactive material shipments for each alternative.
29.28	Radiological Work - Section 3.1 does not address protential releases due to actual reactor compartment structure disassembly and the associated exposure to workers.	Radiological work procedures are designed to minimize both the likelihood of an accident and the consequences of an accident, should one occur. Emergency plans and procedures would remain in place to protect health and safety (see Section 3.1.3.4.2 [Complete Dismantlement of ex-Enterprise at Commercial Facility {Includes In-Water Work}]). For Alternative 3 (Preferred Alternative), the Navy envisions this work would be conducted in accordance with NRC requirements. For Alternatives 1 and 2 the work would be conducted according to NNPP requirements. Both requirements control radioactivity such that the risk presented for possible releases to the environment or by the occupational radiation exposure is small. The estimated radiation exposure and work hours for Alternative 3 (Preferred Alternative) include the effort needed to disassemble the reactor plants and structure and is described in Chapter 2 (Description of Proposed Action and Alternatives) and Section 3.1 (Public and Occupational Health and Safety) of the EIS/OEIS. Additionally, for perspective, between CY 2020 and CY 2022, a radiological services contractor completed size reduction and disposal of the Navy D1G prototype secondary and primary shielding structures. The contractor work hours, personnel exposure (adjusted for decay), and cost to perform the work are similar to those estimated for Alternative 3 (Preferred Alternative).
29.29	Ex-Enterprise is approximately total ship 75,000LT (84,000T), Recycle 47,000LT (52,640T), PSS 28,000LT (31,360T). Weights of recycle metals, hazardous waste, LLRW and LLMW to be shown to closely equal the totals. RCD packages and waste (all) are not recycle material. Please adjust numbers and make this clear.	Table 3.2-1 (Hazardous Waste Estimates) presents the estimated weights of hazardous wastes and non-hazardous scrap. The non-hazardous scrap weight includes non-hazardous waste and recyclable material. The estimates are based on the total ship and propulsion space section, and not separated into what would be in the reactor compartment packages and what would not be, in order to present a comparison between all action alternatives.

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29.30	In water activities need to be added for commercial dismantle as that is how CVs are currently dismantles in Brownsville and how it would be done without a graving dock. Is alt.3 framed in the EIS for drag up on shore? Do any of the three areas considered (Newport News,VA, Mobile, AL, Brownsville, TX) use drag up on shore or a graving dock? Please address.	Alternative 3 (Preferred Alternative) is modeled on conventional aircraft carrier dismantlement, which has been conducted waterborne and has not required the use of a dry dock. The ship is systematically disassembled waterborne while maintaining ship stability, until the final portions of the ship remain. These portions of the ship are then attached to a winch and incrementally pulled partially onto shore to complete the final disassembly efforts. The specific method(s) of dismantlement would be dependent on the location and contractor chosen, which is outside the scope of this EIS/OEIS. All viable locations are expected to have the appropriate facilities and permits in place to implement the method(s) of dismantlement. Section 2.3.2.2 (Partial Dismantlement at Commercial Dismantlement Facility) presents the typical methods for dismantling ships, which are applicable to both partial and complete dismantlement (see Section 2.3.4 [Alternative 3 {Preferred Alternative} - Commercial Dismantlement]).
29.31	Reactor compartment disassemble should be listed in the table	Table 2-1 (Activity Components per Alternative) includes entry for "Complete dismantlement at commercial facility." Necessary reactor compartment disassembly is part of those actions as described in Section 2.3.4 (Alternative 3 (Preferred Alternative) – Commercial Dismantlement).
29.32	DD-4 mods are not discussed. To dry dock the PSS, modification and dolphin installation (in water work) are required. These should be discussed as impacts for alts 1 and 2.	See response to Item #29.3.
29.33	Alt.1 costs showing >$1,102 M - $1,358 M is disingenuous as the Navy has the detail estimate. Provide alt. 1 costs estimate.	The estimates shown in this EIS/OEIS, like all estimates, have an accepted degree of uncertainty but have been calculated in good faith. The estimate for Alternative 1 is consistent with previous estimates performed by the Navy.
29.34	Alt. 3 costs of $554 M-$696M are under estimated. The EIS does not discuss dismantle of the RCs and complicated radiological work. Elsewhere in the EIS the duration of 3 years is used but here in the table it shows 5 years. Zion Illinois's 2 commercial reactor plants are estimted to cost around $1B to completely dismantle and take 10 years (2014-2024), with 200 people working each year. (https://www.pdworld.com/articles/view/nuclear-performance-for-	Under Alternative 3 (Preferred Alternative), the work is estimated to be completed in five years. When this EIS/OEIS cites a three-year duration it is referring to the period of active dismantlement, where dose is expected to be received. The estimates shown in this EIS/OEIS, like all estimates, have an accepted degree of uncertainty. The project duration and cost estimate for Alternative

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	indeco#:~:text=Energy%20Solutions%2C%20through%20the%20subsidiary%20Zion%20Solutions%2C%20is,2011%20decontamination%20and%20demolition%20of%20the%20structures%20began). Please explain how the Navy expects a commercial contractor to completely dismantle 8 EX-Enterprise reactor compartments and reactor plants for less than 69.6% of two commercial plants.	3 (Preferred Alternative) was obtained from a study conducted by the Center for Naval Analysis (CNA), in collaboration with TLG Services. CNA has extensive knowledge of Navy ships, and TLG Services is a subject matter expert for commercial reactor dismantlement. The estimate included the entire work breakdown structure for dismantlement as well as all engineering, management, and radiological work costs. The cost estimate document was posted to ex-Enterprise EIS/OEIS website (https://www.carrierdisposaleis.com) on September 26, 2022. For perspective, the Zion estimate includes complete decommissioning of the site, to include constructing a facility to interim store the spent fuel, relocating the spent fuel from the site spent fuel water pool to the interim storage facility, and remediating the site for unrestricted use. Ex-Enterprise had its fuel removed as part of the ship and reactor plant inactivation at Newport News Shipbuilding, a total cost of over $850M. To construct a true comparison to Zion, a good portion of ex-Enterprise inactivation costs would need to be added to the Alternative 3 (Preferred Alternative) disposal costs. As this EIS/OEIS only covers the post-inactivation disposal of ex-Enterprise, the cost comparisons between the action alternatives are appropriate.
29.35	Demil is not discussed in the EIS. Demil is part of alts 1,2 and 3, however is more extensive for alt. 3 and will incure cost and exposure. Please address demil in the EIS.	Demilitarization efforts would be the same for all alternatives. In an effort to keep radiation exposure as low as reasonably achievable and minimize radiological risk, the NNPP does not require demilitarization for radiologically controlled items; these items would be disposed of as LLRW with sufficient protections against unauthorized access. Similarly, the principle of maintaining occupational radiation exposure as low as reasonably achievable would drive any required demilitarization actions for non-radiologically impacted components away from significant radiation fields (i.e., demilitarization would be conducted off-ship or outside of the propulsion plant spaces).
29.36	Annual report NT-10-2 Occupational Radiation Exposure from U.S. Naval Nuclear Plants and their Support Facilities should be NT-22-2 of May 2022. See https://www.energy.gov/nnsa/articles/naval-reactors-annual-reports	The Navy updated Section 2.3.2.5.2 (Radiation Exposure) of the Final EIS/OEIS to reflect the more recent version of the Occupational Radiation Exposure report.

#	Comment	Response
29.37	RC separations for single RCD packages is not discussed. This is a significant risk, cost and exposure concern for alt.1. Also nowhere in the EIS is the co-joined corner of RCs 4B and 2A discussed as a issue for Alt. 1, 2 and 3 but is a significant challenge. Please address.	Section 3.1.3.2.4 (Work at Puget Sound Naval Shipyard & Intermediate Maintenance Facility – Eight Single Reactor Compartment Packages [No In-Water Work]) states "Alternative 1 would involve dismantlement of the propulsion space section at PSNS & IMF, separation of reactor compartment pairs, and shipment of the eight single reactor compartment packages using the current Navy process. It could take approximately five years for dry dock activities, including the preparation of reactor compartment packages, to be completed (see Table 2-2 [Duration and Cost Estimate per Alternative])." Separation of all conjoined spaces, including their radiological status, is accounted for in Alternatives 1, 2, and 3. The corner of reactor compartments 4B and 2A are not conjoined in ex-Enterprise. There are two reactor compartments with a conjoined corner and PSNS & IMF has judged that the conjoined corner would not create a significant challenge under Alternative 1 or Alternative 2. Further details of how the work would be accomplished is outside the scope of this EIS/OEIS.
29.38	RAR #4 issues are not described. It applies to alts. 1, 2 and 3 and will contribute significant LLRW from the project.	See response to Item #29.17.
29.39	Alt. 2 will still require co-joined RC separation (4B/2A)	See response to Item #29.37.
29.40	What is the cost and environmental impact of constructing a new barge for alt. 2? Please include in the EIS.	The cost of constructing a new barge is included in the cost estimate for Alternative 2. Barge construction is not analyzed individually as a barge would be purchased through the Navy procurement process.
29.41	Comparison to STURGIS is not a reasonable comparison. The STURGIS reactor plant was small (10MW, one loop). Operated for 8 years and shut down for 39 years before D & D. 4 rem of exposure and $66.4M gives an idication that it is orders of magnitude simpler than Ex-Enterprise. (see STURGIS MH-1A Decommissioing Update and Lessons Learned, WM2018, Brenda Barber, P.E. et al. March 2018.) https://www.nab.usace.army.mil/Portals/63/docs/Environmental/HealthPhysics/STURGIS-	The STURGIS example was presented as a proof of concept, not a comparison of scale. Regarding commercial nuclear services companies experience dismantling nuclear power plants, see response to Item #29.4.

#	Comment	Response
	Update_and_Lessons_Learned_March-2018.pdf?ver=2018-04-05-094727-220	
29.42	Comparison to commercial nuclear services industry has some difficulties. Zion commercial plant in Illinois had two reactor plants. The total decommissioning is expected to cost over $1B and 10 years. Commercial plants do not require the complex and robust reactor compartment used in Naval war ships where thousands of people live in close proximity to the operating reactors. Reactor compartments on Ex- Enterprise have robust structures that will require innovation ancd creativity to disassemble. Zion plants were shut down in 1998.	See response to Item #29.4.
29.43	The stated 440 LLRW shipment of large components seem resonable for components (RV, SG, PRZ, CPIX, RCPs, CPP and systems piping and valves). What seems to be missing is an estimate for other LLRW such as structure, decking, insulation material, shielding, vent duct and fans, electrical components/wire and paint. Is all the miscellaneous (anti-Cs, debris etc.) LLRW included in the 440 shipments? Please ensure the 440 estimate includes all waste to be disposed.	See response to Item #29.18.
29.44	Not all radiological concerns are limited to the reactor compartments. RAR 4 has significant radiological concerns. There are radiogical concerns in all RARs, MMRs and AMRs. Please address in the EIS discussion or radiological impacts.	See response to Item #29.17.
29.45	Are CPIX vessels empty or will they need to be solidified for shipment in all altrnatives? Will the Navy provide its solidification process to contractors if solidification is required?	Specific details of carrier spaces/components is outside the scope of this EIS/OEIS. Additionally, this EIS/OEIS does not specify work practices that the selected contractor would follow so long as they are in compliance with applicable shipment regulations.
29.46	Disassembly of reactor compartment bulkheads are complicated as it is a double bulkhead with lead and poly shielding between inner and outter bulkhead. Hydrogen gas is generated by neutrons interaction with polyethanlene shielding. For cruiser RCD extensive effort was required to purge the shielding space prior to welding	The detailed processes employed by the contractor are outside the scope of this EIS/OEIS. Basis for occupational radiation exposure estimates is presented in Section 3.1 (Public and Occupational Health and Safety) and is not dependent on specific work evolutions such as the one discussed in the comment.

#	Comment	Response
	RCD structure to the RC. For CVN 65 complete disassembly of the RC bulkheads will require extensive labor effort and radiological exposure. Please include discussion in EIS.	Additionally, for perspective, the Navy D1G prototype work discussed above, using modern large-scale approaches, was completed on a per-ton basis for approximately half the person-hours, one-third or less of the total cost (removal, transportation, and disposal) per ton, and less than one-tenth of the exposure estimated in the Navy's 1996 EIS using techniques available at the time, and is similar to the cost and dose estimated for Alternative 3 (Preferred Alternative). Multiple lead disposal and recycling options and proven industry dismantlement cutting and shipping methods have improved the effectiveness of this work.
29.47	Add PSW tanks.	The waste shipment estimates for Alternative 3 (Preferred Alternative) include removal of primary shield water tanks and all other reactor plant components.
29.48	Extensive mixed waste from radiological contaminated hazardous waste (ACM, PCBs, lead and chromate contaminated paint, etc.) will require extensive effort. Please address.	The Final EIS/OEIS has been updated to include discussion of mixed waste in the description of Alternative 3 (Preferred Alternative) in Section 2.3.2 (Alternative 1 – Single Reactor Compartment Packages) and Section 2.3.4.1 (Complete Dismantlement of ex-Enterprise at a Commercial Dismantlement Facility).
29.49	No discussion of radiological facilities needed for complete commercial disassembly. Newport News Shipyard has full radiological facilities for handling and packaging liquid and solid radioactive waste. Commercial facilities in Brownville and Mobile (unless developed for SSSB radiological work) do not have and will require radiological facilities to properly process LLRW (solid and liquid). Please address in EIS.	See response to Item #29.19.
29.50	There is no discussion of impact to fleet maintenance by Newport News if they are awareded the complete commercial disposal contract for Ex-Enterprise. Please address.	See response to Item #29.8.
29.51	Discussion of PSNS&IMF workload lacks options to have part of alts.s 1 or 2 accomplished by contractors at PSNS&IMF. A contractor could bring a floating dry dock to PSNS&IMF and accomplished RCD with	PSNS & IMF commissioned a study report in 2015 for the use of a floating dry dock. The report concluded that "Lifting and moving ships of this size and density is a primary concern…Ships of this magnitude would be close to, or beyond, the current limits of this technology…" Additionally, the study points

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	mostly contract personnel and this could mitigate impact to the PSNS&IMF fleet maintenace role.	out that a floating dry dock would not be able to be used for actual recycle activities due to limitations on eccentric loading. Regardless of the potential supplement of PSNS & IMF by contracted personnel, Alternative 3 (Preferred Alternative) is the only alternative that keeps the specially qualified and trained PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivations that are already part of the PSNS & IMF workload.
29.52	No discussion of comparison of PSNS&IMF work load to costs and radiological exposure from complete commercial dismantlment alt.3. Please address.	The Navy has identified Alternative 3 (Preferred Alternative) – Commercial Dismantlement as its preferred alternative because it would keep the specially qualified and trained PSNS & IMF workforce focused on high-priority fleet maintenance work and the submarine inactivations that are already part of the PSNS & IMF workload, provide cost benefits to the U.S. taxpayer, and would not result in significant environmental impacts. For additional discussion see response to Item #29.10. PSNS & IMF work load is presented in Figure 2-21 (PSNS & IMF Workload FY23–FY37). Comparison of costs and radiological exposure for all alternatives is presented in Table ES-2 (Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 [Preferred Alternative]).
29.53	Who will design RV package stated as equivalent to RCDPs? Will RV be separated from PSW tank or will the PSW tank be part of the Type B package?	Reactor vessel package design for Alternative 3 (Preferred Alternative) would include a safety analysis demonstrating compliance with 10 CFR Part 71 for Type B containers and certifications by the NRC that the shipping container meets these requirements. This package will be designed by one or more qualified commercial vendors for submittal to NRC for certification. The Navy conducted market research that identified conceptual package designs for the reactor vessel and internal structures only; as part of the disposal process, the reactor vessels and primary shield water tanks would be separated, with only the reactor vessel requiring shipment in the Type B container. This approach is also reflected in the CNA study providing a cost estimate for the Alternative 3 (Preferred Alternative) disposal concept (see Section 1.3.6 [Removal] from the

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		CAN study), which has separate disposal activities associated with "neutron shield tank" removal.
29.54	Does the 352 shipments include all LLRW that will be generated by complete disassembly? Para. 3.1.3.4.4 states "Approximately 352 CONEX boxes of reactor plant components would be Class A waste." Where is all other LLRW accounted? Does this number include disposal of RC bulkheads (~57,000 SF)? Bulkheads will have polyethanlene and lead shielding as well as PCBs and asbestoes mastic.	See response to Item #29.18.
29.55	"Work practices often involve removing all ACM, adequately wetting all regulated ACM,…." This will be challenging for radiologically contaminated ACM. What is the plan to address?	As a standard work practice for removal of known radiologically contaminated Asbestos Containing Material, workers would perform work as trained in accordance with Occupational Safety and Health Administration standards, local clean air agency jurisdictions, and NRC requirements. While Occupational Safety and Health Administration standards are protective for workers in environments with hazardous work conditions, the stringent NRC radiological control requirements minimize the risk of spreading both radiological contamination and Asbestos Containing Material into the environment and work area.
29.56	"Dismantlement activities would also generate a small number of additional shipments of LLRW incidents to disposal of the reactor plants, which consist of material such as piping, tooling, and personal protective equipment." This statement understates the quantify of additional shipments of LLRW by not including reactor plant structure that will be disposed of as LLRW. Please correct.	See response to Item #29.18. The additional shipments of wastes would be small in comparison to the 440 previously stated. The 440 shipment number is also conservatively estimated as it assumes one CONEX box per shipment, when multiple boxes can transit via rail or by truck.
29.57	8 single RCDP says "No-In-Water Work". Mods to DD-4 to support docking the PSS will require modification including installing dolphins in the water infront of DD-4.	See response to Item #29.3.
29.58	4 dual RCDP says "No In-Water Work". Mods to DD-4 to support docking the PSS will require modification including installing dolphins in the water infront of DD-4.	See response to Item #29.3.

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29.59	"The occupational dose for alt. 2 would be lower than alt. 1…." The lower occupational dose estimate for alt. 2 should be stated.	See response to Item #29.13.
29.60	Need to address the requirement to construct a new RCD barge for alt. 2, 4 Dual RCD packages. The environmental impact of construction of a new barge will be samll but should be addressed for alt. 2.	See response to Item #29.40.
29.61	"… dismantlement work is envisioned to be governed under Navy contract(s) and NRC regulations." Why is it ok for the Navy to decide to control radiological work during dismantlement under the less restrictive NRC requirements (5 rem/yr dose and 10 mrem/year internal airborne) vice NNPP requirements (2 rem/year dose and no aorborne exposure /yr)?	Occupational radiation exposure under all action alternatives is low and within accepted occupational risk values. PSNS & IMF (under Alternatives 1 and 2 [the reactor compartment packaging alternatives]) and the commercial industry (under Alternative 3 [Preferred Alternative]) would adhere to the same federal occupational radiation exposure total effective dose equivalent limit of 5 rem per year. The NRC and the Navy proactively implement radiological control programs that minimize or prevent internal radiation exposure via the use of engineered work controls, administrative controls, or when necessary through the use of breathing protection. The NRC and Navy requirements, in addition to application of ALARA, result in workforce protective work controls consistent with Navy principles of radiological controls presented in NT-22-2. The Navy envisions work procedures employed for commercial dismantlement will be compliant with NRC requirements, and reviewed and approved by the NRC and the Navy. As demonstrated in "Occupational Radiation Exposure From U.S. Naval Nuclear Propulsion Plants and Their Support Facilities", over 99 percent of NRC personnel receive less than 2 rem per year consistent with Navy populations. The analysis in this EIS/OEIS did not identify significant environmental impacts associated with any of the action alternatives. The Navy identified complete commercial dismantlement (Alternative 3 [Preferred Alternative]) as the preferred alternative based on a combination of factors, as discussed in this EIS/OEIS, including the need for PSNS & IMF to focus on priority work, time to complete disposal of ex-Enterprise, and the cost to perform the work. The total exposure for Alternative 3 (Preferred Alternative) was calculated estimating an average exposure rate (1 millirem per hour) combined with the total

#	Comment	Response
		person-hours estimated for the work. This approach can be seen in Section 3.1.3.4 (Alternative 3 [Preferred Alternative]: Commercial Dismantlement).
29.62	"…LLRW would be packaged in accordance with…" Newport News Shipbuilding has permanent facilities for packaging LLRW. Brownsville, TX and Mobile, AL (unless created for the SSSB contract) do not have facilities to package LLRW.	See response to Item #29.19.

29.63	Please add a table comparing CVN 65 alt. 3 to complete disassemebly of STURGIS and Zion.
	
	Debris radiological shipments - STURGIS 68 shipments (1,375,000 lbs.) // Enterprise 440 shipments // Zion xxx
	Water shipments - STURGIS 33 shipments (1,150,000 lbs.) // Enterprise xxxxxx // Zion xxxxxx
	Lead recycled -STURGIS ~600,000 lbs. // Enterprise xxxxxx // Zion xxxxxx
	Dose - STURGIS 4,081 mrem // Enterprise 540,000 mrem // Zion xxxxx
	Costs - STURGIS $66.4M // Enterprise $554 M-$696 M // Zion $1,000M
		See response to Item #29.41.

29.64	"…commercial dismantlement cost estimate (Chilton et al., 2019)" is not available for review. Ken Koemmpel sumbitted a comment (8/29/22) requesting the cost estimate be provided.	The cost estimate document was posted to the ex-Enterprise EIS/OEIS website (https://www.carrierdisposaleis.com) on September 26, 2022.
29.65	Chilton reference not available at The Center for NAVAL Analysis. Provide as an attachement or add a summary of the cost estimate.	The cost estimate document was posted to the ex-Enterprise EIS/OEIS website (https://www.carrierdisposaleis.com) on September 26, 2022.
29.66	540,000 man hours is 67,500 Man days or 8,437.5 Man days/plant. Numbers seem low for the effort. Please revisit cost estimate in light of my other comments.	See response to Item #29.34. Commercial radiological services industry is more optimized for dismantlement work of this kind, while PSNS & IMF is focused on a broader set of capabilities

#	Comment	Response
29.67	"… a small number of additional shipments of LLRW incidental to disposal of reactor plants,…" Where are the RC bulkheads accounted in shipping numbers?	See response to Item #29.18.
29.68	Do LLRW shipments numbers include radiological mixed waste?	The EIS/OEIS scope includes all radioactive wastes, including mixed wastes.
29.69	Table 3.1-4. alt. 1 Impacts from Port of Benton barge slip and road modification is marked. This seem to be an error as alt. 1 does not require slip and road mods.	This error has been corrected in the Final EIS/OEIS.
29.70	… dismattled reactor vessels.." this statement should reflect that the RV is a system including PSW tank and structure (contaminated with posassium chromate a hazardous material) and disposal on the PSW.	The cited section of the EIS/OEIS states examples of waste categories. Detailed description of specific components and structure, including the Primary Shield Water Tank, is outside the scope of this EIS/OEIS.
29.71	"The Navy has developed and implemented a program of total ship recycling to safely dispose of decommissioned nuclear-powered ships." This statement is only true when considering Alts. 1 and 2 with disposal of the reactor compartment as a package. The Navy has never accomplished complete disassembly of a ships nuclear reactor plant and compartments. This is a totally new endeavor. While making casual comparrisons to STURGIS and commercial nuclear power plant dismantle is helpful, this draft EIS lacks details of comparion where Navy Nuclear power plants significanly differ in several major areas of design and operation. 1) Naval reactors are designed to survive significant shock impact requiring robust structure to protect the reactor plants, 2) Naval reactors are designed to operate in close proximity to the crew of the ship and extensive shielding is part of the design, and 3) Naval reactor plants are designed to take battle damage and continue to operation requiring extensive structure and redundancy. These features will significantly increase effort and dose as compared to STURGIS and commercial reactor plants.	See response to Item #29.41 concerning reference to STURGIS dismantlement. In addition, four U.S. Navy land-based nuclear power plant prototypes located in Connecticut and New York were decommissioned and dismantled via complete disassembly (i.e., reactor compartment packages were not constructed). The work was conducted by Navy-contracted personnel. The structure and materials of these prototype nuclear power plants are of the same or similar materials and construction used in nuclear-powered submarines and surface ships, including ex-Enterprise. Also, for perspective, recent Navy D1G prototype shielding and bulkhead work was completed by contractors using modern large-scale approaches to the work. The work was completed on a per-ton of lead and steel basis for approximately half the person-hours, one-third or less of the total cost (removal, transportation, and disposal) per ton, and less than one-tenth of the exposure estimated in the Navy's 1996 EIS (i.e., based on Navy shipyard techniques and disposal options available in 1996). The D1G shielding and bulkhead dismantlement cost and exposure returns (corrected for decay) are similar to the cost and dose estimated for Alternative 3 (Preferred Alternative).

#	Comment	Response
29.72	"... About 3 million packages of radioactive materials are shipped each year…" This may not be a good comparision as most of the radioactive materials shipped each year are small medical samples and solid test sources. Most shipments are not very large items such as RVs and reactor plant components. A table showning numbers by size and or class (A, B, C) should be added to the EIS.	While the shipments of radioactive materials from ship dismantlement may be larger in size, most of the shipments would contain relatively low levels of radioactivity. It is common for radioactive test sources, mentioned in the comparison, to be a very high level of radioactivity. The comparison provides perspective on the total number of annual shipments of radioactive materials that are safely shipped in the United States. Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants) provides a table of shipments that includes the estimated transportation index for each of the estimated 440 radioactive waste shipments. All of the waste shipments with exception of the reactor vessels are expected to be class A, depending on sizing and packaging constraints.
29.73	"… personnel would sort, segregate, and decontaminate waste." Activated structure can not be decontaminated. Please add.	The language has been clarified in the Final EIS/OEIS.
29.74	What is the estimated weight of LLMW for each alts.? Add to table 3.2-1	Low level mixed waste (LLMW) is included in the 352 CONEX box shipments. It would be in separate CONEX boxes from LLRW and sent to the appropriate facilities. Section 3.2.2.1.5 (Mixed Waste) has been updated. It is not the intent of Table 3.2-1 (Hazardous Waste Estimates) to compare any radiological waste amounts.
29.75	"Abatement of hazardous material inside and outside the Ex-Enterprise reactor plant spaces must be accomplished prior to dismantlement." Is this possible? Reactor Compartments will have significant structure that will be radiologically activated and have LBP, PCBs, asbestos mastic and chromate contamination. RAR 4 has significant radiological surface contamination (wire ways, motor windings etc.) that will not be able to be abated prior to removal.	Work would be accomplished in accordance with all applicable local, state, and federal requirements. These wastes would be appropriately managed by permitted hazardous waste treatment and disposal facilities and, as such, would not result in unauthorized exposures to workers or unpermitted releases to the environment. Detailed waste management strategies are outside the scope of this EIS/OEIS. For Reactor Auxiliary Room 4, see response to Item #29.17.
29.76	What is the estimated weight of lead shielding/ballast to be remove for alt. 3? Add to table 3.2-1	Lead used in shielding and ship structure is included in the 352 CONEX box shipments, and disposal is accounted for in cost estimates. Other forms of lead, primarily lead paint, are accounted for in the hazardous waste estimates of Table 3.2-1 (Hazardous Waste Estimates). Some lead and other materials

#	Comment	Response
		may also be recycled rather than disposed of, based on options available for disposition based on material characteristics.
29.77	Table 3.1-4. Alt. 3 lists asbestos only as 2 tons for commercial dismantlement. This shows only 1 ton of asbestos from 8 reactor plants. RARs, AMRs and MMRs had shipalts that removed most of systems asbestos and replaced with non-asbestos insulation. However, RCs have not had any asbestos mitigation. So the 2 ton estimate is low. How do these numbers compare with Ex-Long Beach (CGN-9) RAR/MMR/AMR asbestos removal? Please provider accurate asbestos estimates for each alternative,	Table 3.1-4 is Summary of Impacts and Conclusions on Public and Occupational Health and Safety. However, Table 3.2-1 is Hazardous Waste Estimates and has polychlorinated biphenyls (PCB) Wastes with superscript 2, which states "Includes liquids, bulk product waste (including contaminated asbestos), and paints that may also contain toxic metals (e.g., lead)" in addition to 2 tons of asbestos only. Asbestos-only waste is a small amount due to extensive PCB and/or toxic metal contaminates being included in the make-up of most insulating materials.
29.78	Consider adding insulation mastics to the commonly found PCBs list.	This EIS is not intended to provide an exhaustive list of potential sources of hazardous constituent materials. Sampling would be necessary to determine concentrations, if any, of PCBs and other hazardous constituents. Proper characterization and segregation would be required to ensure appropriate waste management and disposal.
29.79	Lead removal is a significant impact for alt 3, compared to alts 1 and 2.	Under all alternatives, lead disposal would meet lead recycling requirements and disposal requirements of authorized disposal facilities. Washington state law and agreements with DOE Hanford Site govern the amounts and characteristics of lead allowed to remain in the reactor compartment package for transport and disposal. Under Alternative 3 (Preferred Alternative), the majority of lead is accounted for in the 440 shipments of LLRW. Under the interagency agreement with NRC envisioned by the Navy, for Alternative 3 (Preferred Alternative) dismantlement work plans, including waste generation work controls and disposal planning, would be developed by the commercial contractor and reviewed and approved by the NRC and Navy. Additionally, as discussed previously, bulkhead and shielding removal is included in cost, person hours, and exposure estimates. Modern large-scale removal and multiple disposal options are expected to make this work more efficient than work estimated and described in the 1996 EIS. The Final EIS/OEIS (including this appendix) will be available to the commercial contractor.

#	Comment	Response
29.80	Commercial facilities will need to develop radioactive liquid handling processes. Please add to the EIS.	See response to Item #29.19.
29.81	PSW system/tanks will require LLMW processes.	Section 3.2.2.1.4 (Radioactive Potassium Chromate) specifies some of those processes (including evaporation, reduction, and solidification).
29.82	MW para. should address alt. 3 RC sources of MW including mastics, hanger liners, activated/contaminated structure, electric cable and electric components etc.	Section 3.2.2.1.5 (Mixed Waste) provides some examples of LLMW generated under Alternatives 1, 2, and 3 (Preferred Alternative). This is not intended to be an all-inclusive list. All LLMW would be appropriately managed by permitted hazardous waste treatment and disposal facilities and, as such, would not result in unauthorized exposures to workers or unpermitted releases to the environment.
29.83	"This process would not require substantial changes to the infrastructure at PSNS&IMF…" Is this statement true regarding DD-4 modifications required to dock the PSS in DD-4? DD-4 mods are not discussed anywhere in the draft EIS for alts 1 and 2.	See response to Item #29.3.
29.84	"… 3,291 tons of hazardous waste …" Why is this number the same for alt. 1 and alt. 2? Separation of A/B RCs will generate more hazardous waste and LLRW.	See response to Item #29.23.
29.85	A line should be added to the table for RCDP shipment with "o" bubble in alts. 1 and 2.	The Final EIS/OEIS has been updated with an additional line in Table 3.2-2 (Summary of Impacts and Conclusions on Hazardous and Radioactive Waste Management) to account for low-level radioactive waste and hazardous waste separately from the lines for dismantlement activities.
29.86	"DOE HANFORD SITE" should be labeled as "DOE HANFORD SITE 200 EAST AREA". Also properly show the entire Hanford site boundary. Please correct.	The Final EIS/OEIS has been edited appropriately.
29.87	SSSB disposal estimated at $129M, with size and contamination might be equal to 2 EX-Enterprise RCs. This would be equal to $516M, but this is just dismantlement of RCs. 4 each MMRs and 4	The SSSB disposal is a first-of-a-kind effort for the Navy and includes some unique project attributes that are not applicable to ex-Enterprise disposal. These unique attributes ultimately drove additional costs that are reflected in

#	Comment	Response
	each AMRs will require substantial cost. Provides insight that overall commercial cost estimate is low.	the firm-fixed price contract for the SSSB project and can be extracted before attempting to directly scale the SSSB project to ex-Enterprise dismantlement under Alternative 3 (Preferred Alternative). For example, the SSSB was not capable of open-ocean towing, and the contractor was required to arrange for a transport barge or heavy-lift vessel to transport the SSSB from storage in Hampton Roads, Virginia, to the contractor chosen dismantlement site in Mobile, Alabama. Further, due to the size of the SSSB, there are few transport barges or heavy lift vessels capable of transporting the SSSB, so the bespoke nature of this equipment drove a cost premium. To successfully relocate the SSSB to Mobile, Alabama, the contractor leased space at a shipyard in the Hampton Roads area to conduct sea fastening of the SSSB to the transport barge and prepare the SSSB for open ocean transit, which resulted in a separate facility cost. In contrast, ex-Enterprise could be towed directly from storage in Newport News, Virginia, to the contractor-selected dismantlement site. Another example of the uniqueness of the SSSB project is that the SSSB contains substantially less recyclable material than ex-Enterprise, and to ensure project completion, the Navy required the SSSB dismantlement contractor to secure a waste disposal easement equivalent to disposing of the entire SSSB as LLRW (300,000 cubic feet), which drove some additional costs. In contrast, the significant amount of recyclable material in ex-Enterprise is anticipated to offset much of the cost of dismantlement of the ship outside of the propulsion plant spaces. For perspective, the most recent dismantlement contracts for inactivated conventionally powered aircraft carriers (ex-Kitty Hawk and ex-John F. Kennedy) were awarded for $0.01 each on a net-price basis, where the contractor cost recovery and profit are dictated by the value obtained from the sale of recyclable scrap materials.
29.88	The Navy has labor hours and dose estimates for alt. 1 for separation of A/B RCs. These etstimates should be made available in the EIS.	See response to Item #29.13.
29.89	There are approximately 57,000 SF of reactor compartment bulk heads (28 sides, 8 tops, and 8 hull sections, total 44) assuming RCs	

#	Comment	Response
	are approximately 36 FT cubes. Most of this structure is double walled, with sandwiched shielding (lead and polyethlene). Any thermal cutting of these structures will require nitrogen purging to eliminate hydrogen explosion hazard. This will need to be addressed.	Response is for 29.89-91. Reactor compartment structure is accounted for in the 440 shipments whether or not it is contaminated with hazardous materials. Decontamination would be performed as practicable throughout the dismantlement process to reduce amounts of radioactive and/or hazardous waste. Under the interagency agreement with NRC envisioned by the Navy, for Alternative 3 (Preferred Alternative) dismantlement work plans, including waste generation work controls and disposal planning, would be developed by the commercial contractor and reviewed and approved by the NRC and Navy. Additionally, as discussed previously, bulkhead and shielding removal is included in cost, person hours, and exposure estimates. Modern large-scale removal and multiple disposal options are expected to make this work more efficient than work estimated and described in the 1996 EIS. The Final EIS/OEIS (including this appendix) will be available to the commercial contractor.
29.90	There are approximately 57,000 SF of reactor compartment bulk heads (28 sides, 8 tops, and 8 hull sections, total 44) assuming RCs and approximately 36 FT cubes. Most of this structure is double walled, with sandwiched shielding (lead and polyethlene). Much of this structure will require cleaning as lead contamination, LBP, asbestos mastics have contaminate the structure interior surfaces. This will need to be addressed.	
29.91	There are approximately 57,000 SF of reactor compartment bulk heads (28 sides, 8 tops, and 8 hull sections, total 44) assuming RCs and approximately 36 FT cubes. Most of this structure is double walled, with sandwiched shielding (lead and polyethlene). Much of the inner wall structure will be activated and require special cutting methods (non-thermal) and will require disposal as LLRW and possibly LLMW from lead, PCB and asbestos contamination. This needs to be addressed.	
29.92	The challenge of controlling the RCs as High Radiation Areas when they are opened for separation (alt. 1) or complete dismantle (alt. 3) have not been discussed and present a need for unique control processes and facilities. Please address.	Per 10 CFR Part 20, a High Radiation Area means an area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual receiving a dose equivalent in excess of 0.1 rem (1 millisievert) in 1 hour at 30 centimeters from the radiation source or 30 centimeters from any surface that the radiation penetrates. Since the completion of the defueling of ex-Enterprise in December 2016 and further decay of the predominant remaining radionuclide (Cobalt-60) in the reactor plants, the current radiological condition of ex-Enterprise reactor compartments no longer require designation as High Radiation Areas. The Navy or contractor could take action to downgrade ex-Enterprise reactor compartments from High Radiation Areas (e.g., to Radiation Areas) based on a

#	Comment	Response
		radiological assessment and survey data and apply those radiation protection controls. The designation of ex-Enterprise reactor compartments as High Radiation Areas or otherwise does not drive significant process or facilities requirements for any of the Alternatives beyond those discussed in this EIS/OEIS. Further, the details of specific radiation protection control requirements are outside the scope of this EIS/OEIS.
29.93	Commercial facilities will need to develop radiological administrative processes such as training, emergency response and dose monitoring. Please address.	Training, emergency response, and dose monitoring would be per federal, NRC, and Navy requirements (as applicable). Under Alternative 3 (Preferred Alternative), these would be contractually invoked consistent with typical commercial radiological services contractual requirements. These contractually invoked activities would also include outreach and coordination with local stakeholders and responders to ensure compliance with requirements, response readiness, and protection of the environment and the public.
29.94	A table should be added showing comparison betweem NNPP and NRC radiological requirements showing differences.	See response to Item #29.61 for a discussion comparing NRC and Navy requirements. Both the NRC and Navy requirements ensure work is completed with the same radiological principles discussed in "Occupational Radiation Exposure From U.S. Naval Nuclear Propulsion Plants and Their Support Facilities" (NNPP, 2022). Applying NRC requirements via contract provides a well understood ruleset for contractors for successful accomplishment of commercial nuclear decommissioning projects, radiological waste packaging, and disposal. Both the NNPP and civilian nuclear industry approaches to radiological waste processing and disposal are well established, meet federal requirements, and are protective of workers, the public, and the environment. Using civilian nuclear industry requirements for dismantlement and associated radioactive waste handling, packaging, and disposal results in a lower-cost solution for disposal of ex-Enterprise than traditional NNPP reactor compartment disposal methods. This EIS/OEIS references the STURGIS project to give a recent

#	Comment	Response
		example of National Environmental Policy Act documentation covering a similar project and a similar regulatory structure. Both NRC and NNPP requirements control radioactivity such that the risk presented for possible releases to the environment or by the occupational radiation exposure is small and within all applicable limits for protection of human health and the environment.
29.95	If the Navy selects complete commercial disassembly as the best alternative will the Navy readdress its current operation of accomplishing submarine RCD? If complete commercial disposal is the best action to keep shipyards focused and performing fleet maintennace, can be done cost effectively and within NRC exposure and disposal requirements why continue submarine RCD?	This Final EIS/OEIS is focused on ex-Enterprise disposal. The Navy is not considering complete commercial dismantlement for submarines at this time.

C.2.5.21 K. Koemmpel

#	Comment	Response
30.1	29 Aug. 2022. Section 3, Page 3.1-19 middle of the page states "For the purpose of estimating the collective dose for the commercial dismantle of ex-Enterprise under Alternative 3 (Preferred Alternative), the workforce and project duration estimates were selected from the commercial dismantle cost estimate (Chilton et al., 2019)." The Chilton reference is listed in section 7, page 7-2 and states that Cost estimate for commercial dismantlement and disposal of CVN 65. Arlington, VA: The Center for Naval Analysis. I have searched the Center for Naval Analysis website and extensively on the internet and have not been able to locate or obtain this cost estimate. Please provide access to or a copy of this reference. This reference is necessary to properly review Alternative 3.	The cost estimate document was posted to the ex-Enterprise EIS/OEIS website (https://www.carrierdisposaleis.com) on September 26, 2022.

C.2.5.22 M.

#	Comment	Response
31.1	The Navy (Public Shipyards), should be the sole organization responsible for dismantling and disposing of NNPP activity and reactors, not a for-profit company that may cut corners. Invest in public shipyards, expand the workforce and increase their capabilities to defend the USA against Russia / China. Or tow it to the south china sea and use it for target practice and save the taxpayers 2 billion dollars.	Commenter preference acknowledged. Currently, complete dismantlement and recycling of the entire ex-Enterprise at Puget Sound Naval Shipyard & Intermediate Maintenance Facility would not be an effective use of the limited resources available, detracting from the shipyard ability to complete the highest priority fleet maintenance work. Dismantling is the only method approved for the disposition of nuclear-powered ships stricken from the Naval Vessel Register and is required to be accomplished in the United States or its territories in accordance with the statutory responsibilities of the Naval Nuclear Propulsion Program. U.S. law has prohibited ocean disposal of low-level radioactive materials since 1994 pursuant to the amended terms of the London Convention, to which the United States is a Contracting Party. The Navy envisions contractually invoking Nuclear Regulatory Commission (NRC) requirements and obtaining NRC oversight via an interagency support agreement to accomplish the dismantlement of ex-Enterprise. The Navy would retain regulatory authority and contractually support use of the NRC requirements. The NRC would review project planning and engineering documents, conduct oversight of project execution, and provide the Navy recommendations for enforcement with the Navy dismantlement contractor. Additionally, see response to Item #12.1.

C.2.5.23 B. McElroy

#	Comment	Response
32.1	Having spent a good Portion of my young life on the Big E I would like to have a memento piece of it. I have 10 Squadron mates who also would Like a part. We spent 8 Months off the coast of Vietnam and worked hard at our assigned duties. A small piece of the ship seems to be the least we could ask for rather than Have it made into razor blades.	See response to #12.1 and #11.1.

C.2.5.24 R. Pensa

#	Comment	Response
33.1	For all that money to be wasted on scrapping her, why not REFIT her making her state of the art and send recommission her	See response to Item #12.1.

C.2.5.25 D. Poteat

#	Comment	Response
34.1	Why not have a plan to sink the ship at a location in the Gulf, off of the coast of Alabama, that has at least 150 feet of water. It would make a beautiful artificial reef with many benthic communitiy dwellers and a dive spot for scuba divers. An example would be the Oriskany that was scuttled off of Florida a few years ago..	While the Final EIS on the Disposal of Decommissioned, Defueled Naval Submarine Reactor Plants (1984) describes possible at-sea disposal of decommissioned, defueled Naval submarine reactor plants, U.S. law has prohibited ocean disposal of low-level radioactive materials since 1994 pursuant to the amended terms of the London Convention, to which the United States is a Contracting Party. Contracting Parties agreed their states would not deliberately dump certain types of sea waste from their ships into the ocean, including radioactive wastes or matter.

C.2.5.26 C. Reno

#	Comment	Response
35.1	Though not identified as one of the three possible locations for decommissioning, would the Navy consider the former Naval Shipyard at Charleston, SC (now owned by Detyens) an option for decommissioning the Enterprise?	This EIS/OEIS does not dictate the location the work would occur. During the scoping period, the Navy evaluated all reasonable proposed alternatives and locations that demonstrated an interest and the necessary capability. If the Record of Decision chooses the commercial alternative, a contractor may submit a bid for completing the work in a non-evaluated location which will be evaluated at that time. If feasible alternative commercial locations are identified, appropriate environmental analysis would be completed.
35.2	Please provide the Navy Cost Estimate (2019 or more recent) identified in Table ES-2: Summary of Environmental Impacts for the	The cost estimate document was posted to ex-Enterprise EIS/OEIS website (https://www.carrierdisposaleis.com) on September 26, 2022.

#	Comment	Response
	No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Page ES-13) for further analysis.	
35.3	Perma-Fix strongly supports the Preferred Alternative #3 for commercial remediation and dismantlement.	Commenter preference acknowledged.

C.2.5.27 M. Richards

#	Comment	Response
36.1	Here is a bit of historical perspective for your work as regards Admiral H.G. Rickover "the father of Naval nuclear propulsion" comments as he received the Kroll Medal in 1975 entitled: "History of the development of zirconium alloys for use in nuclear reactors" (see attached)	Comment acknowledged. The report submitted by the commenter is publicly available online from the U.S. Department of Energy at History of the development of zirconium alloys for use in nuclear reactors (Technical Report) | OSTI.GOV.

C.2.5.28 M. Richards

#	Comment	Response
37.1	In future EIS/OEIS proceeding it would seem useful to consider an alternative where the vessel in question could be utilized with some modification as a “power source” in its moored configuration similar to what Russia has been doing for some of its more isolated northern coastal cities. A reasonable person can see that one approach might be feasibility studies with/by DOE the US Navy (Naval Nuclear Propulsion Program) & Idaho National Laboratory to PRESERVE electrical power/steam generating capacity that we are currently burying, which of course is a long term liability.	See response to Item #12.1. The Navy defueled and decommissioned ex-Enterprise after a thorough comparison of maintenance cost against the benefit of continued service and concluded the ship should be retired from service. Additionally, the technology in ex-Enterprise is not particularly well suited for efficient or economic commercial production of electricity as the technologies are optimized for military applications. The cost to the U.S. taxpayer to pursue this option would be prohibitive.

#	Comment	Response
	Problematically, available amounts of sufficiently enriched fissile materials may be an issue, OTOH, perhaps the propulsion reactor designs could used effectively at lower enrichment. We might expect that our nation could bring significant generating capacity on-line in shorter time than building from scratch in the normal regulatory startup process. (perhaps because of non-military safety requirements) These reactors could be operated on Military reservations or possibly other, new secure cantonments.	

C.2.5.29 P. Sayles

#	Comment	Response
38.1	I concur with the proposed civilian shipyard to dismantle the ship. While keeping PSNSY available for USN work, it will keep a commercial shipyard operational for the length of the demolition. It will be good for the commercial sector and free the Navy to concentrate on operational requirements.	Commenter preference acknowledged.

C.2.5.30 G. Stitt

#	Comment	Response
39.1	The historical lessons learned on scrapping nuclear ships areas is that nuclear particles will be found through - out the entire ship. for example It will be found on air ducts, ladders, ledges all through the ship. The company that will perform the tear apart CVN-65 must teach workers on how to look for nuclear waste in crevices , air ducts, and man other areas that collect dust.	The health and safety of the public, military and civilian personnel, and the environment are of utmost importance to the Navy. The Navy procedures for the protection of people and the environment meet or exceed all applicable federal, state, and local environmental health and safety laws and regulations. The Navy remains committed to this high standard. A commercial vendor would be subject to all applicable local, state, and federal environmental and radiation protection requirements during dismantlement of ex-Enterprise. The Navy envisions contractually invoking Nuclear Regulatory Commission (NRC) requirements and obtaining NRC

#	Comment	Response
	The government must ensure the workers are protected from nuclear waste...	oversight via an interagency support agreement to accomplish the dismantlement of ex-Enterprise. Under the interagency agreement with the NRC as envisioned by the Navy, the Navy would retain regulatory authority and contractually support use of the NRC requirements. The NRC would review project planning and engineering documents, conduct oversight of project execution, and provide the Navy recommendations for enforcement with the Navy dismantlement contractor.

C.2.5.31 G. Stitt

#	Comment	Response
40.1	Ex-Enterprise CVN 65 is a significant undertaking. Considering the capabilities of PSNS and it's capabilities and the areas where we can stow the reactors in Washington State. PSNS has significant expertise in doing just that.This cannot be a funding issue rather the focus should be on safety!! PSNS has the skills and capabilities.	Commenter preference acknowledged.

C.2.5.32 J. Tillman

#	Comment	Response
41.1	Having personally served on the U.S.S. Enterprise, for almost four years, I think I have a viable solution, that would save millions and could possibly make millions: 1. Locate a suitable geographical location, off a major waterway, deep enough to float the Big E., to a place where a large basin can be dug. There are several ways the ship could be safely and permanently placed. Not only could the basin be lined with an impermeable permanent barrier to protect the enviroment (including test wells and French drains), but once once the ship is lightened, and in place, flooding the double hull would allow the ship to rest safely on the bottom. Once the ship is secure, the flooded double-hull-compartments can then be safely removed,	See response to Item #12.1 and #11.1.

#	Comment	Response
	permanently locking the hull in place. 2. Raise private funds to cover the cost of the move. As a small child, I gave my lunch money to help pay for the U.S.S. Alabama BB 60"s move from Bremerton, WA to Mobile, AL, where it permanently rests today. It's a major tourist attraction. I still have personal letters stuck in lagging (a time capsule), I placed there 40 years ago. I'm sure, of the thousands of sailors who served on the ship, many would love to see the Big E turned into a profitable museum. How many times has the sailing ship U.S.S. Constitution been visited, much less how much money has been raised over the years? After all, "it's the first nuclear powered aircraft carrier." Most of all, it would be a viable solution to NOT dealing with any radioactive problems, due to dismantling the ship. It would be so much easier to inert, encase, and mitigate any long term concers about radiation.. Weigh the cost!	

C.2.5.33 W. Ungren

#	Comment	Response
42.1	Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) has a highly trained and detail oriented workforce. PSNS & IMF employees train extensively for performing radiological work, radiological control work, and hazardous waste work. This includes packaging and disposal of radioactive and/or hazardous waste and total reactor packages. They are experienced in Naval Nuclear Reactor disposal processes and procedures and already have had experience in Reactor Compartments with common bulkheads on the Ex-Triton, the Ex-Truxton, Ex-Bainbridge, Ex-Long Beach and many others. This extensive training is a cost already paid for by the American taxpayer. These previous work projects included the same or similar environmental and radiological issues and concerns as are expected with the Enterprise. Experience in previous projects has included engineering, designing, and building new	See response to Item #28.1. Also see response to Item #29.22 for information regarding emergency plans and severe weather events. All other comments from the BMTC have been noted.

#	Comment	Response
	containment packages for shipping and disposal that did not exist before. It was a tremendous task due to the engineering specifications required. The Enterprise will require engineering, designing, and building of new containment packages for shipping and disposal of the Reactor Compartments as either twin packages or singular packages. Such packages currently do not exist, but have been looked at by personnel here at PSNS. It will also be a tremendous task for the same reasons and the Enterprise's packages will be larger. Bremerton Metal Trades Council is wary of a for-profit company engineering, designing and building containment packages for shipping and disposal to the engineering specifications required and to make a profit on the venture. There is also a question of physical security. While it is true that Puget Sound Naval Shipyard and Intermediate Maintenance Facility is not far from the international border with Canada, not as much is heard about a "border crisis" with Canada or government corruption and influence from various drug cartels. There is also not the rampant illegal immigrant migrations from various countries, including some that wish to spread terrorism, that go through Canada like there is through Mexico to reach the United States. Many of the components and systems aboard Enterprise are still classified information. Additionally, there is likely to be inclement weather conditions in alternate locations. Tornadoes are a very rare occurrence in the Pacific Northwest, and when the do occur, they are mild in comparison. There are never hailstones as large as baseballs. Although there was one EF3 rated tornado in 1972. Texas also had one EF3 rated tornado in 1972, along with 20 EF2 rated and a total of 145 tornadoes. The Pacific Northwest has never had a hurricane, they are impossible; the water is too cold. BMTC is also concerned with what working conditions will be encountered by the contractor's employees. The contractor who is the lowest bidder is probably not very likely to provide good working conditions and facilities to the workers nor are they going to get the best workers. There is also a concern that the contractor with the lowest bid will	

#	Comment	Response
	not use workers that are not a security risk to the country to cut corners and save money.	

C.2.5.34 J. Van Warreby

#	Comment	Response
43.1	Forgive me if this is already outlined in one of the existing proposals, but it is my understanding that in large part, why it is likely PSNS will not land this project is due to the personnel and resource shortages for a 15-year commitment to the dismantling of ex-Enterprise, perhaps the following can be supported. Just as with ex-Long Beach, PSNS can keep ex-Enterprise pierside between docked availabilities. Considering the multitude of plants this vessel has, in between Nimitz-class DPIAs in DD6 at Puget, ex-Enterprise can spend the time required in DD6 to support one plant's dismantling. Then be moved back to pierside for the next DPIA for a CVN-68 class. So while this would still take 15 years, it wouldn't be 15 consecutive years, and could still be supported with undoubted turnover and attrition, for both mechanics and radiological controls alike. In between each DPIA, the remaining plants would continue to go through half-lives, making later dismantling even better in terms of exposure reduction.	Based on dry dock availability, ex-Enterprise would be pierside for 10 years undergoing waterborne dismantlement, followed by five years in the dry dock to complete reactor compartment disposal package construction. Furthermore, once the propulsion space section is docked, it would quickly be not seaworthy as the hull is dismantled to get to the reactor compartments. The Navy's approach for Long Beach is considered separately from disposal of ex-Enterprise. As discussed in Section 2.4 (Preferred Alternative) and depicted in Figure 2-21 (PSNS & IMF Workload FY22–FY37), the Puget Sound Naval Shipyard & Intermediate Maintenance Facility workload does not contain periods of excess capacity.

C.2.5.35 Individual (Anonymous)

#	Comment	Response
44.1	Sell it to an ally that could use it as a carrier. Immediately save 10million/year and possibly still have it used against an enemy in a future war.	See responses to Item #12.1 and Item #14.1.

C.2.5.36 Individual (Anonymous)

#	Comment	Response
45.1	These ships should be dismantled in Puget Sound, and the reactors should be disposed at Hanford. No other places have the experience necessary for doing this work	Commenter preference acknowledged. See responses to Items #9.3 and #28.1.

Comment Document #10

Kryptos 4
Cryptography Services & Consulting
[redacted]
Applying Cryptography for the Future

Office of Congressional & Public Affairs
Attn: Ex-Enterprise CVN-65 Draft EIS/OEIS
Puget Sound Naval Shipyard and Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072
Bremerton, Washington
98314-2072

Thursday, August 25, 2022

OCPA, NAVSEA & Members of the EIS/OEIS Authorship:

It was my pleasure to review the EIS/OEIS dated August 2022. I would like to thank the extensive effort and undertaking of this task by the entire ex-Enterprise effort as the US Government continues to make headway in dismantling CVN-65. It is of the interest of the citizenship of all states involved that we understand the capacity and impact such a task requires as we begin to make history in taking the necessary and cautious steps to decommission such a historic vessel.

In this I have the following concerns and recommendations that will need to be considered prior to finalizing the EIS/OEIS. In order of the report, I will keep my comments concise but descriptive to maintain clarity.

1. The Hanford site consideration. Additional consideration regarding the Hanford site needs to be accurately reflected in terms of the history of and continuing cleanup efforts at the Hanford site as the result of the Superfund starting in 1988. Additional risk regarding efforts in the events regarding on site single shell tanks regarding radioactive waste need to be considered as well as their current leak rates.

    a. The public needs to know this background, considerations and what the Navy is planning to do to prevent this considerable amount of leakage possible surrounding the decommissioning process utilizing the facility. Environmental stewardship needs to pave the way to making the Hanford site more environmentally friendly verses the past. If leaks happen from CVN-65 waste stream this should not add to the significant cost already occurring as the cleanup and remediation continues.

    b. Goal: We do not want to any CVN-65 product leaking into to the Hanford site and make it worse than it already is.

10.1

2. Regarding ES.5- Were any other agencies outside of the Navy, NAVSEA, NR or DOE considered in alternative planning? What other public-private partnerships formed this conclusion as #3? Why were alternative options not considered; if it was cost, we need to

10.2

10.2 (cont.) state that. Did any conclusions cost less; and were they considered?

10.3 3. Regarding ES.7- For low level radioactive waste, we are talking <450uuCi/method/cm^2/scan, equivalent Co-60? What is the definition of LLRW?

10.4 4. Regarding the pressure of contracts to complete this work: We the public understand the pressure of contracts and shipyard workers. However, the long-term consequences of not getting this right in the beginning has consequences as well. The decommissioning and responsible dismantling of the USS Enterprise is just as important as delivering a new carrier or submarine. If we are demonstrating and placing environmental policy as a priority; this process is as or more important than the delivery of a new carrier or submarine. If this is the case then we need to do what we say, rather than say what we do. If labor is the issue, we need to state that. There is nothing in here about the delays as the result of COVID-19 or the slow-down in materials regarding this project.

10.5 5. Regarding ES.7-4: Concur and recommend Savannah River Site as primary, the other two sites can accept any other waste that is not allowed at SRS. For PSWET tanks and adjacent painted surfaces, has consideration been given for fixed contamination regarding Zn-65 isotopes? What would be the LLRW for this isotope and would you consider the <1pCi/g of this material to be LLRW? What other radiological controls would you institute to consider Co-60 equivalent and how would they be measured during the term of the execution of the contract, who would do this measurement and who gets the reports?

10.6 6. Regarding ES.8.1: I concur on all fronts. However, we also need to state and loudly echo that ALARA will be maintained as the standard.

10.7 7. Regarding 2.6.3.2: What radionuclides are of concerned that are long lived outside of Co-60 and Zn-65 during teardown of this project in PSWT/RC/RAR/AMR spaces? Where are these prevalent and to what concentrations are of concern?

10.8 8. Regarding: 3.1.1.3.2 Atomic Energy Act –Expand this if possible.

10.9 9. Regarding 3.2.2.1.2-PCBs-We need to divide the expected PCB waste into the respective Aroclors to understand the impact of environmental leaching.

   a. Which PCBs are you talking about and in what concentration are expected? An average is okay as well. Is it <50ppm?
   b. Are we talking 1016/1248/1268? These are all mixtures but understanding which ones are where regarding the reactor plants, PSWT, and AMR/RAR spaces will help greatly. When you say tons of material, this doesn't help to quantify concentration or indicate the magnitude of the risk.

Comment Document #10

10.10 10. Regarding: 3.2.2.1.4- Are we discussing Chromates as Cr3+, Cr6+ and what controls are being considered to protect worker exposure to Chromates. Additionally, for PSWT are Zn-65 radionuclides considered in addition to Chromates? What would be the exposure limits of both be to the labor force? What controls would be instituted and how would this waste stream be handled?

I commend all of you for the detail in the environmental and radiological impact thus far in this version of the draft EIS/OEIS. The results and work of this magnitude have not gone unnoticed. However, with the great work that has already been completed please understand that there are still items of concern and risk that will need to be chased to ground because of this undertaking. Primarily that of environmental stewardship and to provide adequate transparency to the citizen taxpayer.

Sincerely,

[redacted]

President

Comment Document #11

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6687

Submit Date: 8/19/2022 11:55 AM

Who are you representing? Individual

Organization/Affiliation:

Full Name: G[redacted]Baumer

Address: [redacted]

Comment:

11.1 As a veteran serving many days upon the USS Enterprise (CVN 65) my concern is mostly of respecting the ship's legacy while disposing of its remains. This ship served the United States honorably for a long time. So my concern, knowingly is emotionally based, it's still a concern on ensuring respect is shown when possible. She was the best ship I served on and still holds a place in my soul.

Comment Document #12

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6702

Submit Date: 9/10/2022 8:04 AM

Who are you representing? Individual

Organization/Affiliation:

Full Name: G[redacted]Berka

Address: [redacted]

Comment:

12.1 Good Morning, Convert the Enterprise into the new Savannah, and put her to use as a climate and national heritage ambassador! The Nuclear Ship Savannah was the U.S.'s first and only civilian, nuclear-powered merchant ship. She showed great potential, and was removed from service largely for just economic reasons. Today, the situation is different. The specter of climate change is drawing renewed attention to civilian, nuclear-powered shipping as a low-carbon alternative to bunker oil. The Enterprise may potentially fit this role quite well. Her enormous capacity could make her a useful cargo ship, and she could potentially also fulfill other roles, such as humanitarian and disaster relief missions. Not to mention being a dispatchable, floating, nuclear power plant, capable of being quickly sailed to where she is needed. She could have done a great deal of good if moored in New York Harbor, to cleanly power New York City during the outage after Hurricane Sandy. Or in Puerto Rico after Hurricane Maria. With her special place in history and national heritage value, she could also be an operational, floating museum, open for public tours. If her (8) reactors have not been removed yet, refuel them and return them to service! This ship is far too important and valuable to turn into scrap metal. It would be a bold statement for both national heritage and the climate, to continue operating her as a magnificent, carbon-free vessel. Regards, -George Berka Aerospace Engineer, Pilot, and Pro-Nuclear Advocate

Comment #13

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6753

Submit Date: 10/3/2022 7:18 PM

Who are you representing? Individual

Organization/Affiliation:

Full Name: B[redacted]Caddell

Address: [redacted]

Comment: I am extremely concerned about the location of proposed Alternative 3 which includes the use of private contractors to dismantle the ship and dispose of the non-nuclear waste generated by this operation. I object to the use of the Port of Mobile for this project for the following reasons: • Weak regulatory agencies will be tasked with monitoring compliance with appropriate regulations. ADEM is the state agency tasked with enforcing compliance and ADEM's Air Quality Monitoring Plan was rejected by EPA earlier this year. Additionally, ADEM relies on industry's self- reporting of discharges. It is no wonder that many citizens have commented on the need for more robust monitoring. • Lack of experience in dismantling and handling the amount of non-nuclear hazardous waste generated by this project. • Risk to cultural resources – just upriver from the proposed dismantlement area is the community of Africatown which has just been placed on the World Monument Fund List. Having one more polluting industry in close proximity to this important site poses a sizeable risk to plans to develop this area for tourism.

13.1

13.2

Comment Document #14

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6689

Submit Date: 8/22/2022 7:07 PM

Who are you representing? Organization / Affiliation

Organization/Affiliation: Modern American Recycling Services, Inc.

Full Name: K[redacted]Caton

Address: [redacted]

Comment: Modern American Recycling Services, Inc. has been in the recycling business for over 50 years in the United States with several facilities in Louisiana and deep water facility in Mobile, Alabama. M.A.R.S. Has opened its first international facility in Denmark 3 years ago. The facility in Denmark has all of the permits and EU approvals for recycling semi submersibles, FPSO's, SHIPS, Tankers, Fixed Platforms, etc. This facility is state of the art with an ALL CONCRETE ship ramp with dimensions of 300 ft wide and 1,000 ft long. We are currently cleaning and recycling an FPSO weighing 36,000 tons and several other projects. Information about this facility can be provided upon request. M.A.R.S. Also has floating derrick barges ranging from 850 ton to 1,780 ton lift capacity that can participate in the reactor removal process. These vessels can travel to any destination for lifting of the reactors and placing them into barges for transport to storage facility. We would like to meet with officials to discuss our possibilities and thoughts and methodologies we would utilize on the safe recycling of the ex- enterprise. One Question: Once the reactors are out of the ship, can the carrier be transported to Denmark to be recycled in a state of the art EU approved facility as an option? I was in Virginia a few years ago in a meeting and proposed our facility in Mobile, AL and I believe Mobile is now a consideration. I can be reached on my emai[redacted] or my cell a[redacted].

14.1

Comment Document #15

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6700
Submit Date: 9/8/2022 7:33 AM
Who are you representing? Individual
Organization/Affiliation:
Full Name: J[redacted] Caviness
Address: [redacted]
Comment:
15.1 I agree with the Navy's solution to dismantle the hull, and dispose of the reactors of the Enterprise at their chosen facilities. It is kind of sad to see this grand ship reaching its final destination this way, and was wondering if maintaining it as a Naval museum was no longer an option.

Comment Document #16

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6696
Submit Date: 9/6/2022 5:22 AM
Who are you representing? Individual
Organization/Affiliation:
Full Name: G[redacted] Chartrand
Address: [redacted]
Comment:
16.1 So your proposal breaks an agreement with Russia on disposal on reactors. OK, I know Russia cannot be trusted but does that justify us following their lead? Hanford has spent millions to create a safe space to store these reactors and has been used for that purpose for a very long time. The site is designed to safely store the reactors in perpetuity, there is no other site that can be used thus a new one has to be created. This is a waste of millions of dollars for what?? What state is going to agree to create a nuclear waste dump for the next 10,000 years?? So now you are going to have private contractors perform the work probably at 3x the cost, create e new nuclear waste dump no one wants. Who comes up with these stupid ideas???

Comment Document #17

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6690
Submit Date: 8/23/2022 2:26 PM
Who are you representing? Individual
Organization/Affiliation:
Full Name: Z[redacted] Cook
Address: [redacted]
Comment:
17.1 How many deaths and serious injuries could be expected to recycle ex-ENTERPRISE by commercial recyclers, given the safety record of commercial ship recycling companies, when compared with the Navy's safety record in recycling ships? For example, see: https://www.referenceforbusiness.com/history2/13/International-Shipbreaking-Ltd-L-L-C.html

Comment Document #18

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6748

Submit Date: 9/30/2022 11:41 PM

Who are you representing? Individual

Organization/Affiliation:

Full Name: G[redacted]Cruz

Address: ,,,,, Philippines

18.1 **Comment:** Hello USN, I'm considering a plan for tge ex-Enterprise to be taken to the Philippines as is for me to have it as an alternative of a carrier disposal.

Comment Document #19

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6710

Submit Date: 9/12/2022 7:23 AM

Who are you representing? Individual

Organization/Affiliation:

Full Name: R[redacted]Dickson

Address: [redacted]

Comment:

19.1 Disaster emergency response vessel. As a Nuclear Aircraft Carrier, It is a small city including an airport. Currently the ship-- Can desalinate up to 200K gallons of fresh water a day. Provide emergency medical/surgical/dental services to 6K folks 24/7. Makes 18K hot meals a day (6000 3 times a day). Can berth 6000 personnel. Hold 60 to 80 aircraft. Hanger to maintain those a/c and storage for boats and heavy equipment- With certain provisions and refits; the ship could immediately provide; temporary local Government a base to operate, shelter for refugees, on scene command base, emergency & medical services. Navy Seabees can maintain & manage necessary heavy construction equipment, Emergency, search, rescue, security vehicles to set up temporary infrastructure. Immediate security infrastructure (Assisting local law enforcement) can be handled by USMC, local National Guard. Military medics first in support for search & Rescue assisting local Emergency First Responders. Ships medical department could provide Emergency triage, surgery, medical & dental services and assist local hospital get back on line. The Carriers flight deck provides capability to land many different Helo platforms. The ship can fall under US Homeland Security and manned by US Navy/ Coast Guard & Merchant Marine personnel including Reservists. During a disaster Medical personnel can be tapped from military and civilian. The ship could provide a good training platform for the sea services including Military Academies & ROTC's. Best part is this particular ship would not need to be refueled for 20 years. Yeah maybe over-kill and a helo carrier would be more economical but this is a thought. Note: How old are our hospital ships...

Comment Document #20

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6725

Submit Date: 9/19/2022 2:26 AM

Who are you representing? Individual

Organization/Affiliation:

Full Name:

Address: [redacted]

Comment:

20.1 International disposal in Australia for the disposal of the Enterprise is best. https://www.weforum.org/agenda/2018/11/destroying-nuclear-waste-to-create-clean-energy-it-can-be-done/ The Navy must develop nuclear propulsion systems with salt water thorium, for stealth, fast, and endurance. Thorium reactors can reduce nuclear waste and Uranium, Plutonium fuels. Thorium plants are cleaner energy for military, and civilian use. UK + US subs disposal to be at Australia. Seawolf subs to the UK. Hi DOE team, I am C[redacted]Dreher, a resident of Malden, MA (near Boston, MA). Right now, I am eager to participate in the discussion relative to the disposal of the USS Enterprise CVN -65. Today, I tried to access the public comments section of the website. Unfortunately, the website seems to be a dead link. Please let me know if this can be confirmed. I would really like to participate in the public forum on September 20 and 22. The topic of Ship Recycling Programs and scrapping is an important one for the United States and the United Kingdom. Currently, both the United States and the United Kingdom are burdened with the significant challenge of dealing with the decommissioned nuclear vessels. The US has the task of both determining, and completing the decommissioning of its nuclear powered Nimitz-class carriers, as well as the Los Angeles attack-class and Ohio ballistic missile-class submarine boats. The United Kingdom is faced with similar daunting dilemmas regarding its own attack class and ballistic missile class submarines. To note, the government of Australia is seeking to replace its Collins attack-class submarines as well. The Australian government is seeking to upgrade its submarine fleet to nuclear powered vessels to offset the growing naval threat that China poses in the South Pacific. I recommend considering an arrangement with the Australian government to the effect of the discussion regarding the safe, and secure disposal of the 20 nuclear submarines from the UK, and the 20 nuclear submarines from the US. The proposed arrangement between the Australian-UK-US governments as part of the partnership between all three nations, would be that the Australian government would be tasked with the recycling of the 40 total nuclear submarines of the UK and US- in exchange for selling the 3 Seawolf-class boats to the UK government. The UK is best to receive the 3 Seawolf-class submarines as their entire attack-class fleet consists of only 5 boats currently. The 40 submarines between both the UK and the US are ideally scrapped in Australia, as the Macdonnell and Muskgrave Ranges are superb for receiving the decommissioned waste. The non-radioactive material can be recycled for the production of new Australian navy vessels. Furthermore, it is recommended that Australia be advised to purchase Invincible-class submarines that more closely mirror the current specifications and characteristics of the Collins-class submarines. The success and evaluation of Australian naval activity with regard to the 40 decommissioned nuclear submarines would be essential proving for the exploration of nuclear submarine programs for Australia. I firmly recommend doing this proposal as it is an immensely beneficial observational program for future Australian naval programs. The Australian government would be generously compensated for the nuclear ship recycling of the 40 decommissioned nuclear vessels. To augment the desire for a bolstered naval presence in Australia, it could also be beneficial to consider sale of several conventionally powered surface vessels from the United States inventory. The decision is important, as the Chinese navy is becoming ever more present, and posturing in the South Pacific. Please acknowledge this email, as read, reviewed, and also do respond to it, (thanks!). I am recommending these arrangements for the United States, the United Kingdom, Australia, and Germany. It is essential for the United States and the United Kingdom recycle their decommissioned submarines, Australia gain experience with nuclear operations while replacing its conventional attack-class submarines. The proposed arrangement is decisively enormous, in endeavor and cost; yet, the resolution of all four countries' submarine fleet concerns would most optimally be met. I would greatly appreciate a thoughtful reply and considerate conversation regarding my suggestions, as the futures of nuclear naval fleets is directly in question- due to the significant topic of ship recycling, in particular concern about nuclear waste and contamination. Thank you for your read, review, and response to my message. I look forward to your dedicated reply. The Enterprise is not optimally disposed in the US. The Puget Sound Navy yards need to be allocated for new ship production. Two additional ports are optimal for Navy yards and bases: Eureka, CA, USA Coos Bay, OR, USA

Comment Document #21

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6708

Submit Date: 9/12/2022 12:35 AM

Who are you representing? Individual

Organization/Affiliation:

Full Name: J[redacted]Ernst

Address: [redacted]

Comment:

21.1 I believe this ship would make a great research facility for future propulsion and clean energy projects, among many other projects that could be hosted in a movable, floating city, with an airport. It could be host to many entitie such as the Navel Research Labs, NASA, etc. Funding could come from many different agencies, some permanent, some rotating, and some ad-hoc. Or you could operate it like an international space station, welcoming a community of science experiments. New methods of fire fighting and rescue could be developed there. Environmentally clean methods of ship operations and even ocean cleanup are desperately needed. Special ops training could take place there. The first sustainable cold fusion reactor could be proven there. New nuclear fission technologies could be developed and proven there. I could probably go on and on and still never guess what it would actually be used for. Never the less, it's a National icon of American ingenuity and could make us even more proud in the years to come. Plus you could host Star Trek conventions for some extra cash each year; if you use it to advance humanity in a moral and ethical way.

Comment Document #22

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6713

Submit Date: 9/13/2022 5:48 AM

Who are you representing? Individual

Organization/Affiliation:

Full Name: M[redacted]Flie

Address: [redacted]

Comment:

22.1 Dear US Navy/ CNC I have submitted several ideas to the Navy and to the President in regard to the future of the USS Enterprise CVN 65. I believe that it's history, its service record and the financial logistics surrounding it merits saving the Enterprise rather than scrapping it. Do a minor fix up of the carrier and restore her back to its original appearance. Turn her into a Recruiting/PR vessel. Its duty will be to your the entire United States year-round. Going port to port and working in conjunction with each local recruiting office. The Enterprise will be open to the general public for people of all ages to view the carrier. Maybe a minor tour of a couple of key areas of the vessel and maybe some demonstrations of planes and helicopters taking off from the carrier. This would be a great value to the Navy as a Recruiting vessel for the Navy and promote a positive connection with the military rather than turning this historic vessel into soup cans. Think about it… Sincerely, Michael A Flie, BA[redacted]

Comment Document #23

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6695
Submit Date: 9/4/2022 7:51 PM
Who are you representing? Individual
Organization/Affiliation:
Full Name: S[redacted] Gauss
Address: [redacted]
Comment:
23.1 I believe the first option is both the most economically prudent as well as historically so. To spend billions to destroy this ship is wasteful in the extreme. Additionally, technology will undoubtedly advance to the point where she could be repurposed as a museum ship in the future. Scrapping cannot be undone once started.

Comment Document #24

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6692
Submit Date: 8/29/2022 8:48 AM
Who are you representing? Individual
Organization/Affiliation:
Full Name: P[redacted] Gray
Address: [redacted]
Comment:
24.1 Please continue to use the approved methods for transport to the Hanford Environmental Restoration Site. The Hanford Site has set a superior standard for receiving and proper handling and storing of the reactor compartments for many years The Alternate methods 1 and 2 should also be used for the proper disposal of the reactor compartments.

Comment Document #25

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6698
Submit Date: 9/6/2022 10:33 AM
Who are you representing? Individual
Organization/Affiliation:
Full Name: J[redacted] Haffner
Address: [redacted]
25.1 **Comment:** Please bring Enterprise to Mobile! We will honor and cherish her.

Comment Document #26

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6704

Submit Date: 9/10/2022 4:15 PM

Who are you representing? Individual

Organization/Affiliation:

Full Name: M[redacted]Hawthorne

Address: [redacted]

Comment:

26.1 The Navy can completely avoid decommissioning issues and bolster deterrence of China by offering the Enterprise to India -- which has civilian and military nuclear expertise, to replace the reactors Funding along with the Enterprise of 500 million along with technical support could be offered. This would offset the potential advantage of China having a 2 to 1 advantage of ski jump carriers, along with a further advantage of its newest diesel flat top fitted with electromagnetic launchers, against India's single ski jump carrier that has a smaller displacement than China's two Soviet carriers. China would then be hemmed in by two Navies with a nuclear carrier capability. It would be both a strategic move to hem in China and a cost saving measure saving hundreds of millions of dollars by shifting the ultimate decommissioning responsibility to India.

Comment Document #27

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6694

Submit Date: 9/1/2022 12:28 PM

Who are you representing? Individual

Organization/Affiliation:

Full Name: G[redacted]Hillesland

Address: [redacted]

Comment:

27.1 Will financial information be provided? What will the price be to the commercial enterprise for the breaking of this ship? What are the gross and net profits expected for the commercial enterprise? Will compensation of officers of the commercial enterprise be presented?

Comment Document #28

Comment ID#: 6691

Submit Date: 8/24/2022 12:32 PM

Who are you representing? Individual

Organization/Affiliation:

Full Name: S[redacted] kelly

Address: [redacted]

Comment:

28.1 I disagree that alternative 3 should be the preferred method. Yes, private shipyards are dismantling ex CVs and other commercial power plants, these were not nuclear powered vessels. The public shipyards (PSNS) has a specialized workforce than can dismantle the ex-Enterprise ship in the safest possible manner. Alternative 3 is lower in total dollar cost, however the total radiation exposure is about 80% higher than the other alternatives. With the understanding that any radiation exposure has some health risks associated with it. The final overall outcome using Alternative 3 will be a higher fatality rate. The human cost that can't be converted to dollars, as a human life is priceless. So why expose a workforce to higher total exposure? PSNS has demonstrated 138 times that they can safely and with lower exposures dismantle/dispose of reactor compartments. The workforce is highly trained in NNPP methods and dedicated to supporting the Navy's needs. While the private sector has little or no experience dismantling Navy nuclear powered vessels. This increases the possibility of unforeseen events that can and will increase the overall cost of disposal. Also an unwanted event will reflect poorly on the public's opinion of the Navy's nuclear propulsion program. This public opinion is very important to the viability of the program as a whole. Without it, the program could be shutdown. Alternative 3 generates a considerable additional amount of LLRW compared to the other 2 alternatives. This is not good for the environment overall and storage space is limited. Yes, it will be stored correctly at a storage location, however this waste will be around way longer than anyone making the decision of who is going to dismantle the ex-Enterprise. We owe it to our future generations to make the best possible decisions for what is best for the environment even if at the moment it has a higher cost. The anticipated growth in PSNS workload is only an educated guess and may not actually occur. The Navy has done an outstanding job of load leveling PSNS workload over the years. I have full confidence that PSNS can be able to work through the workload issues while still supporting the Navy's needs. Alternative 1 is the best option for our country. Thank you for taking the time to read my option.

Comment Document #29

Comment ID#: 6752

Submit Date: 10/3/2022 1:31 PM

Who are you representing? Individual

Organization/Affiliation:

Full Name: K[redacted] KOEMMPEL

Address: [redacted]

Comment: Please see attached PDF file. It contains 95 comments. If there are questions about my comments you may contact me a[redacted] or [redacted]. V/R Ken Koemmpel

Number	Section	Page	Para.	Comment
1	ES	i	ES.3	Does selection of alt. 3 set precidence for CVN 68 class to do commercial complete dismantlement?
2	ES	ES-2	ES.3	after "... Navy & DOE, 1984)..." add here after referred to as the 1984 EIS."
3	ES	ES-3	ES.3	Statement is misleading "This process would not require substantial changes to the infrastructure at PSNS & IMF". What is substantial? Through out the EIS the Port of Benton mods and Handford site mods are addressed, but the EIS does not address required PSNS&IMF DD-4 modification to safely address PSS docking (guiding dolphins and guide system in dry dock). Does the EIS assume for alts. 1 and 2, CVN 65 RCD will be accomplished in DD-6? Using DD-6 has the most impact on Pacific Fleet maintenance vice DD-4. If DD-4 is to be used for alts. 1 and 2 add the impacts of DD-4 modifications including in water work to install guide dolphins.
4	ES	ES-3	ES.3	"...successful ongoing commercial nuclear power plant decommissioning (by contract with nuclear services companies.)" Commercial plants are significantly different from Naval reactor plants. Zion commercial plant is used as an example for comparison. Zion had 2 reactor plants, containment buidings are steel reinforced concrete. CVN 65 has 8 reactor plants with steel reinforced, double bulkhead, shielded reactor compartments. Activated/contamintated structure is nowhere addressed in the draft EIS.
5	ES	ES-3	ES.3	EIS states "successful dismantlement of a U.S. Army Barge (STURGIS) contained a defueled nuclear reactor..." The STURGIS reactor plant was shut down for 39 years before it was dismantled. It operated for 8 years and was a small reactor, 10 MW. Also contained one loop (one SG). Not set up as a warship with battle hardening. Please explain the proprotionality of this comparison.
6	ES	ES-4	ES.4	CEQ should be spelled out first use "Council of Environment Quality (CEQ)"
7	ES	ES-7	ES.7	Alt. 3. This summary does not address added impacts and risks of commercial dismantlement. These include: 1) increased cumulative radiological exposure to workers, increased radiological waste, increased radiological shipments, increased risk of open disassembly of 8 reactor compartment that create increased risk of spread of radioactivity from possible fire, and tropical storms etc. Please address.
8	ES	ES-7	ES.8.1	If Newport News Shipyard (NNS) is awarded the contract for complete dismantlement of Ex-Enterprise there would be impacts to Fleet maintenance as NNS accomplishes CVN construction and CVN refueling overhauls, in addition to construction of submarines. Please addresses this concern when discussing fleet maintenance impacts in the EIS.
9	ES	ES-10	ES.8.1	Why is the Navy willing to use NRC exposure requirements that result in higher exposure to the individual workers? There is no comparison in the draft EIS of radiolgical exposure risk as compared to the need for PSNS&IMF to accomplish fleet maintenance.

Number	Section	Page	Para.	Comment
10	ES	ES-10	ES.8.1	The Navy should consider and evaluate mitigating impacts to the PSNS&IMF work force by contracting commercial companies to perform dismantle/RCD work at PSNS&IMF or other Pacific Northwest locations (Portland). Naval contractors perform work in Portland in floating dry docks and is located along the RCD shipping route on the Columbia River. This could address work load issues and perfrom the lowest cost, lowest radiological exposure/risk option. Analize this option in the EIS.
11				The Navy should consider an option to perform Alternative 1 or 2 by utilizing commercial contractors in the Portland, OR area. Performing shipbreaking/RCD in a commercial facility in the lower Columbia River has many advantages. 1. No need to construct the Propulsion Space Section (PSS) Cost and time savings, 2. No need to perform heavy lift and transport of the PSS to PSNS&IMF Cost and time savings, 3. LLRW shipment process was proven during the dismantlement of the Trojan Nuclear Power Plant (2005) near Portland, OR., 4. It eliminates the need to use facilities and personnel engaged in fleet maintenance at PSNS&IMF and NNS, 5. Elimination of the open ocean tow of Reactor Compartment Disposal Packages from PSNS&IMF to the Columbia River will significantly reduce the construction requirements for Type B packaging, and 6. Radiological dose and hazardous material exposure and disposal would be considerably lower than Alternative 3. The Navy should address this alternative in this EIS for CVN 65.
12	ES	ES-11	ES.8.1	Spell out ICRP "International Commission on Radiological Protection (IRCP)"
13	ES	ES-11	ES.8.1	This summary should state clearly total exposure for all alts.s. Saying 300 rem over 5 years for both Alts.s 1 and 2 is misleading. If 8 single RCD packages results in 300 rem of exposure then 4 dual packages would be substatially less. Dual packages eliminate removal of the common RC bulkhead between RCs A and RCs B. Also the RCs will not be required to be open to the environment. Please address these issues in the EIS.
14	ES	ES-11	ES.8.1	"The estimate for reactor compartment packages is based on scaling radiological exposure data for nuclear cruiser reactor compartment packaging and is expected to be conservative and bounding." This is not a true assumption for single RCD packaging because the RC A/B common bulkhead must be removed and is extensive radiolgical work. Requires removing PRZ and CPIX and the common bulkhead. Please address as a difference between alts 1 and 2.

Number	Section	Page	Para.	Comment
15	ES	ES-11	ES.8.1	The radiological exposure estimate (540 rem) for alt. 3 complete disassembly is low. If 8 single packages require 300 rem by just basic factors, alt. 3 should require at least 3300 rem. Each RC has 6 sides that require disassembly (minus 4 for common bulkheads) for a total of 44 RC sides under alt.3. For alt. 1 there are 4 common bulkheads that require disassembly. So alt. 3 has 11 times more bulkhead removal. Simple math results in 300 X 11 = 3300 rem for alt. 3. Even if this method is not exact the 540 rem number is clearly low and not realistic. Please reassess the exposure estimated for all alternatives.
16	ES	ES-13	ES-2	Alt. 1 cost. Provide the actual cost eatimate. The shipyard has this number and should be shown for a fair comparison.
17	ES	ES-13	ES-2	RAR 4 is not addressed as a cost/exposure and will be a significant cost for alt. 1, 2 and 3. Please address.
18	ES	ES-13	ES-2	Alt. 3, 440 CONEX boxes seems low and is not obvious what is included. Shipments will include reactor plant components and contaminated/activated structure. Also all RCs insulation (systems and bulkhead) are asbestos and much of it is radiologically contaminated. There are 28 RC bulkheads, 8 RC tops, and 8 bottom hull sections for a total of 44 sections. Each section is about 36 feet square. There is 57,000 SF (44 sides X 36x36 SF). Each section would need to be cut in to 6 FT X 18 FT pieces to fit in a 20 FT CONEX or 528 pieces. If you stack 4 pieces in each CONEX thats 132 CONEX. Is this how the estimate was done? Does the EIS assume that most of the RC bulk heads can be realased from radiological controls and disposed of as recycle material? Please address in the EIS.
19	ES	ES-13	ES-2	Alt. 3, "Required Infrastructure Improvements". Saying infrastructure improvements are not required for alt. 3 is not accurate. If complete commercial dismantlement is accomplished at Newport News they have the general required radiological facilities. If alt. 3 is accomplished in Alabama or Texas some radiological material processing facilities will be required.
20				Dismantlement has begun at the Alabama Shipyard of the Navy decommissioned Surface Ship Support Barge. The dismantlement is a joint venture between APTIM Federal Services, LLC and Alabama Shipyard. The project is expected to be complete in 2024 and budgeted at $129 million. (Information from Table 4-1, pge 4-10). Has the Alabama shipyard created radiological processing facilities? Address the need for radiological processing facilities for alt. 3.
21	ES	ES-13	ES-2	Alts. 1 and 2 both require infrastructure with mods to DD-4 at PSNS&IMF. Please add.
22	ES	ES-14	ES-2	It should be made clear in the EIS that alt. 3 has radiological risks thousands of times greater than alt. 1 and 2. Does the risk assessments include risk of spread of radioactivity by fire or tropical storm? Disassembly of Naval reactor plants is significantly more complicated than commercial plant disassembly.

Number	Section	Page	Para.	Comment
23	ES	ES-14	ES-2	Hazardous and Radioactive Waste Management (Section 3.2) Hazardous waste estimates are the same for alt. 1 and alt. 2. This is not true. Alt. 2 will have less hazardous waste due to not separating the A/B RCs. Provide accurate estimates.
24	ES	ES-14	ES-2	Hazardous and Radioactive Waste Management (Section 3.2) Non-Hazardous waste estimates are the same for alt. 1 and alt. 2. This is not true. Alt. 2 will have less non-hazardous waste due to not separating the A/B RCs. Provide accurate estimates.
25	ES	ES-14	ES-2	Hazardous and Radioactive Waste Management (Section 3.2) Radiological waste quantity estimates are not provided and are not the same for alt. 1 and alt. 2. Alt. 2 will have less radiological waste due to not separating the A/B RCs. Provide accurate estimates.
26	ES	ES-15	ES-2	Biological Resources (Section 3.5). In-water hull cleaning prior to tow from Hampton Roads area. Is hull cleaning allowed in the Hampton Roads area? Ex-Kitty Hawk (CV 64) required to be dry docked for hull cleaning before tow from Bremerton, WA to Brownsville, TX (Jan 2022)
27	ES	ES-18	ES-2	Note 3. LLRW shipments are not equal for all the alts.s. Alt. 2 has the fewest shipments, then alt. 1 and alt. 3 has significantly more shipments. The table and note should reflect accurate estimates for comparison.
28	1	1-16	1.8.1.4	Radiological Work - Section 3.1 does not address protential releases due to actual reactor compartment structure disassembly and the associated exposure to workers.
29	2	2-1	2.1	Ex-Enterprise is approximately total ship 75,000LT (84,000T), Recycle 47,000LT (52,640T), PSS 28,000LT (31,360T). Weights of recycle metals, hazardous waste, LLRW and LLMW to be shown to closely equal the totals. RCD packages and waste (all) are not recycle material. Please adjust numbers and make this clear.
30	2	2-2	Tab 2-1	In water activities need to be added for commercial dismantle as that is how CVs are currently dismantles in Brownsville and how it would be done without a graving dock. Is alt.3 framed in the EIS for drag up on shore? Do any of the three areas considered (Newport News,VA, Mobile, AL, Brownsville, TX) use drag up on shore or a graving dock? Please address.
31	2	2-3	Tab 2-1	Reactor compartment disassemble should be listed in the table
32	2	2-4	Tab 2-2	DD-4 mods are not discussed. To dry dock the PSS, modification and dolphin installation (in water work) are required. These should be discussed as impacts for alts 1 and 2.
33	2	2-4	Tab 2-2	Alt.1 costs showing >$1,102 M - $1,358 M is disingenuous as the Navy has the detail estimate. Provide alt. 1 costs estimate.

Number	Section	Page	Para.	Comment
34	2	2-4	Tab 2-2	Alt. 3 costs of $554 M-$696M are under estimated. The EIS does not discuss dismantle of the RCs and complicated radiological work. Elsewhere in the EIS the duration of 3 years is used but here in the table it shows 5 years. Zion Illinois's 2 commercial reactor plants are estimted to cost around $1B to completely dismantle and take 10 years (2014-2024), with 200 people working each year. (https://www.pdworld.com/articles/view/nuclear-performance-for-indeco#:~:text=Energy%20Solutions%2C%20through%20the%20subsidiary%20Zion%20Solutions%2C%20is,2011%20decontamination%20and%20demolition%20of%20the%20structures%20began). Please explain how the Navy expects a commercial contractor to completely dismantle 8 EX-Enterprise reactor compartments and reactor plants for less than 69.6% of two commercial plants.
35	General			Demil is not discussed in the EIS. Demil is part of alts 1,2 and 3, however is more extensive for alt. 3 and will incure cost and exposure. Please address demil in the EIS.
36	2	2-17	2.3.2.5.2	Annual report NT-10-2 Occupational Radiation Exposure from U.S. Naval Nuclear Plants and their Support Facilities should be NT-22-2 of May 2022. See https://www.energy.gov/nnsa/articles/naval-reactors-annual-reports
37	2	2-17	2.3.2.5.3	RC separations for single RCD packages is not discussed. This is a significant risk, cost and exposure concern for alt.1. Also nowhere in the EIS is the co-joined corner of RCs 4B and 2A discussed as a issue for Alt. 1, 2 and 3 but is a significant challenge. Please address.
38	2	2-17	2.3.2.5.3	RAR #4 issues are not described. It applies to alts. 1, 2 and 3 and will contribute significant LLRW from the project.
39	2	2-25	2.3.3.5.2	Alt. 2 will still require co-joined RC separation (4B/2A)
40	2	2-33	2.3.3.9	What is the cost and environmental impact of constructing a new barge for alt. 2? Please include in the EIS.
41	2	2-33	2.3.4	Comparison to STURGIS is not a reasonable comparison. The STURGIS reactor plant was small (10MW, one loop). Operated for 8 years and shut down for 39 years before D & D. 4 rem of exposure and $66.4M gives an idication that it is orders of magnitude simpler than Ex-Enterprise. (see STURGIS MH-1A Decommissioing Update and Lessons Learned, WM2018, Brenda Barber, P.E. et al. March 2018.) https://www.nab.usace.army.mil/Portals/63/docs/Environmental/HealthPhysics/STURGIS-Update_and_Lessons_Learned_March-2018.pdf?ver=2018-04-05-094727-220

Number	Section	Page	Para.	Comment
42	2	2-33	2.3.4	Comparison to commercial nuclear services industry has some difficulties. Zion commercial plant in Illinois had two reactor plants. The total decommissioning is expected to cost over $1B and 10 years. Commercial plants do not require the complex and robust reactor compartment used in Naval war ships where thousands of people live in close proximity to the operating reactors. Reactor compartments on Ex-Enterprise have robust structures that will require innovation ancd creativity to disassemble. Zion plants were shut down in 1998.
43	2	2-35	2.3.4.1	The stated 440 LLRW shipment of large components seem resonable for components (RV, SG, PRZ, CPIX, RCPs, CPP and systems piping and valves). What seems to be missing is an estimate for other LLRW such as structure, decking, insulation material, shielding, vent duct and fans, electrical components/wire and paint. Is all the miscellaneous (anti-Cs, debris etc.) LLRW included in the 440 shipments? Please ensure the 440 estimate includes all waste to be disposed.
44	2	2-35	2.3.4.1	Not all radiological concerns are limited to the reactor compartments. RAR 4 has significant radiological concerns. There are radiogical concerns in all RARs, MMRs and AMRs. Please address in the EIS discussion or radiological impacts.
45	2	2-35	2.3.4.1	Are CPIX vessels empty or will they need to be solidified for shipment in all altrnatives? Will the Navy provide its solidification process to contractors if solidification is required?
46	2	2-35	2.3.4.1	Disassembly of reactor compartment bulkheads are complicated as it is a double bulkhead with lead and poly shielding between inner and outter bulkhead. Hydrogen gas is generated by neutrons interaction with polyethanlene shielding. For cruiser RCD extensive effort was required to purge the shielding space prior to welding RCD structure to the RC. For CVN 65 complete disassembly of the RC bulkheads will require extensive labor effort and radiological exposure. Please include discussion in EIS.
47	2	2-35	2.3.4.1	Add PSW tanks.
48	2	2-35	2.3.4.1	Extensive mixed waste from radiological contaminated hazardous waste (ACM, PCBs, lead and chromate contaminated paint, etc.) will require extensive effort. Please address.
49	2	2-35	2.3.4.1	No discussion of radiological facilities needed for complete commercial disassembly. Newport News Shipyard has full radiological facilities for handling and packaging liquid and solid radioactive waste. Commercial facilities in Brownville and Mobile (unless developed for SSSB radiological work) do not have and will require radiological facilities to properly process LLRW (solid and liquid). Please address in EIS.
50	2	2-37	2.4	There is no discussion of impact to fleet maintenance by Newport News if they are awareded the complete commercial disposal contract for Ex-Enterprise. Please address.

Number	Section	Page	Para.	Comment
51	2	2-37, 38	2.4/2.5	Discussion of PSNS&IMF workload lacks options to have part of alts.s 1 or 2 accomplished by contractors at PSNS&IMF. A contractor could bring a floating dry dock to PSNS&IMF and accomplished RCD with mostly contract personnel and this could mitigate impact to the PSNS&IMF fleet maintenace role.
52	2	2-37	2.4	No discussion of comparison of PSNS&IMF work load to costs and radiological exposure from complete commercial dismantlment alt.3. Please address.
53	2	2-42	2.6.3.1	Who will design RV package stated as equivalent to RCDPs? Will RV be separated from PSW tank or will the PSW tank be part of the Type B package?
54	2	2-43	Tab 2-4	Does the 352 shipments include all LLRW that will be generated by complete disassembly? Para. 3.1.3.4.4 states "Approximately 352 CONEX boxes of reactor plant components would be Class A waste." Where is all other LLRW accounted? Does this number include disposal of RC bulkheads (~57,000 SF)? Bulkheads will have polyethanlene and lead shielding as well as PCBs and asbestoes mastic.
55	3	3.1-6	3.1.1.3.3.1	"Work practices often involve removing all ACM, adequately wetting all regulated ACM,...." This will be challenging for radiologically contaminated ACM. What is the plan to address?
56	3	3.1-9	3.1.2	"Dismantlement activities would also generate a small number of additional shipments of LLRW incidents to disposal of the reactor plants, which consist of material such as piping, tooling, and personal protective equipment." This statement understates the quantify of additional shipments of LLRW by not including reactor plant structure that will be disposed of as LLRW. Please correct.
57	3	3.1-13	3.1.3.2.4	8 single RCDP says "No-In-Water Work". Mods to DD-4 to support docking the PSS will require modification including installing dolphins in the water infront of DD-4.
58	3	3.1-16	3.1.3.3.4	4 dual RCDP says "No In-Water Work". Mods to DD-4 to support docking the PSS will require modification including installing dolphins in the water infront of DD-4.
59	3	3.1-16	3.1.3.3.4	"The occupational dose for alt. 2 would be lower than alt. 1...." The lower occupational dose estimate for alt. 2 should be stated.
60	3	3.1-16	3.1.3.3.4	Need to address the requirement to construct a new RCD barge for alt. 2, 4 Dual RCD packages. The environmental impact of construction of a new barge will be samll but should be addressed for alt. 2.
61	3	3.1-18	3.1.3.4.2	"... dismantlement work is envisioned to be governed under Navy contract(s) and NRC regulations." Why is it ok for the Navy to decide to control radiological work during dismantlement under the less restrictive NRC requirements (5 rem/yr dose and 10 mrem/year internal airborne) vice NNPP requirements (2 rem/year dose and no aorborne exposure /yr)?
62	3	3.1-18	3.1.3.4.2	"...LLRW would be packaged in accordance with..." Newport News Shipbuilding has permanent facilities for packaging LLRW. Brownsville, TX and Mobile, AL (unless created for the SSSB contract) do not have facilities to package LLRW.

Number	Section	Page	Para.	Comment
63	3	3.1-19	3.1.3.4.2	Please add a table comparing CVN 65 alt. 3 to complete disassemebly of STURGIS and Zion.
				Debris radiological shipments - STURGIS 68 shipments (1,375,000 lbs.) // Enterprise 440 shipments // Zion xxx
				Water shipments - STURGIS 33 shipments (1,150,000 lbs.) // Enterprise xxxxxx // Zion xxxxxx
				Lead recycled -STURGIS ~600,000 lbs. // Enterprise xxxxxx // Zion xxxxxx
				Dose - STURGIS 4,081 mrem // Enterprise 540,000 mrem // Zion xxxxx
				Costs - STURGIS $66.4M // Enterprise $554 M-$696 M // Zion $1,000M
64	3	3.1-19	3.1.3.4.2	"...commercial dismantlement cost estimate (Chilton et al., 2019)" is not available for review. Ken Koemmpel sumbitted a comment (8/29/22) requesting the cost estimate be provided.
65	7	7-2	3.1	Chilton reference not available at The Center for NAVAL Analysis. Provide as an attachement or add a summary of the cost estimate.
66	3	3.1-19	3.1.3.4.2	540,000 man hours is 67,500 Man days or 8,437.5 Man days/plant. Numbers seem low for the effort. Please revisit cost estimate in light of my other comments.
67	3	3.1-21	3.1.3.4.3	"... a small number of additional shipments of LLRW incidental to disposal of reactor plants,..." Where are the RC bulkheads accounted in shipping numbers?
68	3	3.1-21	3.1.3.4.3	Do LLRW shipments numbers include radiological mixed waste?
69	3	3.1-22	3.1.5	Table 3.1-4. alt. 1 Impacts from Port of Benton barge slip and road modification is marked. This seem to be an error as alt. 1 does not require slip and road mods.
70	3	3.2-7	3.2.1.2.3	... dismattled reactor vessels.." this statement should reflect that the RV is a system including PSW tank and structure (contaminated with posassium chromate a hazardous material) and disposal on the PSW.
71	3	3.2-8	3.2.1.3	"The Navy has developed and implemented a program of total ship recycling to safely dispose of decommissioned nuclear-powered ships." This statement is only true when considering Alts. 1 and 2 with disposal of the reactor compartment as a package. The Navy has never accomplished complete disassembly of a ships nuclear reactor plant and compartments. This is a totally new endeavor. While making casual comparrisons to STURGIS and commercial nuclear power plant dismantle is helpful, this draft EIS lacks details of comparion where Navy Nuclear power plants significanly differ in several major areas of design and operation. 1) Naval reactors are designed to survive significant shock impact requiring robust structure to protect the reactor plants, 2) Naval reactors are designed to operate in close proximity to the crew of the ship and extensive shielding is part of the design, and 3) Naval reactor plants are designed to take battle damage and continue to operation requiring extensive structure and redundancy. These features will significantly increase effort and dose as compared to STURGIS and commercial reactor plants.

Number	Section	Page	Para.	Comment
72	3	3.2-9	3.2.1.3	"... About 3 million packages of radioactive materials are shipped each year..." This may not be a good comparision as most of the radioactive materials shipped each year are small medical samples and solid test sources. Most shipments are not very large items such as RVs and reactor plant components. A table showning numbers by size and or class (A, B, C) should be added to the EIS.
73	3	3.2-10	3.2.2.1	"... personnel would sort, segregate, and decontaminate waste." Activated structure can not be decontaminated. Please add.
74	3	3.2-10	3.2.2.1	What is the estimated weight of LLMW for each alts.? Add to table 3.2-1
75	3	3.2-10	3.2.2.1	"Abatement of hazardous material inside and outside the Ex-Enterprise reactor plant spaces must be accomplished prior to dismantlement." Is this possible? Reactor Compartments will have significant structure that will be radiologically activated and have LBP, PCBs, asbestos mastic and chromate contamination. RAR 4 has significant radiological surface contamination (wire ways, motor windings etc.) that will not be able to be abated prior to removal.
76	3	3.2-10	3.2.2.1	What is the estimated weight of lead shielding/ballast to be remove for alt. 3? Add to table 3.2-1
77	3	3.2-10	3.2.2.1	Table 3.1-4. Alt. 3 lists asbestos only as 2 tons for commercial dismantlement. This shows only 1 ton of asbestos from 8 reactor plants. RARs, AMRs and MMRs had shipalts that removed most of systems asbestos and replaced with non-asbestos insulation. However, RCs have not had any asbestos mitigation. So the 2 ton estimate is low. How do these numbers compare with Ex-Long Beach (CGN-9) RAR/MMR/AMR asbestos removal? Please provider accurate asbestos estimates for each alternative,
78	3	3.2-11	3.2.2.1.2	Consider adding insulation mastics to the commonly found PCBs list.
79	3	3.2-12	3.2.2.1.3	Lead removal is a significant impact for alt 3, compared to alts 1 and 2.
80	3	3.2-12	3.2.2.1.4	Commercial facilities will need to develop radioactive liquid handling processes. Please add to the EIS.
81	3	3.2-12	3.2.2.1.4	PSW system/tanks will require LLMW processes.
82	3	3.2-12	3.2.2.1.5	MW para. should address alt. 3 RC sources of MW including mastics, hanger liners, activated/contaminated structure, electric cable and electric components etc.
83	3	3.2-15	3.2.3	"This process would not require substantial changes to the infrastructure at PSNS&IMF..." Is this statement true regarding DD-4 modifications required to dock the PSS in DD-4? DD-4 mods are not discussed anywhere in the draft EIS for alts 1 and 2.
84	3	3.2-21	3.2.3.3.4	"... 3,291 tons of hazardous waste ..." Why is this number the same for alt. 1 and alt. 2? Separation of A/B RCs will generate more hazardous waste and LLRW.
85	3	3.2-25	Tab 3.2-2	A line should be added to the table for RCDP shipment with "o" bubble in alts. 1 and 2.
86	3	3.2-3	Fig 3.4-2	"DOE HANFORD SITE" should be labeled as "DOE HANFORD SITE 200 EAST AREA". Also properly show the entire Hanford site boundary. Please correct.

Number	Section	Page	Para.	Comment
87	4	4-10	Tab 4-1	SSSB disposal estimated at $129M, with size and contamination might be equal to 2 EX-Enterprise RCs. This would be equal to $516M, but this is just dismantlement of RCs. 4 each MMRs and 4 each AMRs will require substantial cost. Provides insight that overall commercial cost estimate is low.
88	General			The Navy has labor hours and dose estimates for alt. 1 for separation of A/B RCs. These etstimates should be made available in the EIS.
89	General			There are approximately 57,000 SF of reactor compartment bulk heads (28 sides, 8 tops, and 8 hull sections, total 44) assuming RCs are approximately 36 FT cubes. Most of this structure is double walled, with sandwiched shielding (lead and polyethlene). Any thermal cutting of these structures will require nitrogen purging to eliminate hydrogen explosion hazard. This will need to be addressed.
90	General			There are approximately 57,000 SF of reactor compartment bulk heads (28 sides, 8 tops, and 8 hull sections, total 44) assuming RCs and approximately 36 FT cubes. Most of this structure is double walled, with sandwiched shielding (lead and polyethlene). Much of this structure will require cleaning as lead contamination, LBP, asbestos mastics have contaminate the structure interior surfaces. This will need to be addressed.
91	General			There are approximately 57,000 SF of reactor compartment bulk heads (28 sides, 8 tops, and 8 hull sections, total 44) assuming RCs and approximately 36 FT cubes. Most of this structure is double walled, with sandwiched shielding (lead and polyethlene). Much of the inner wall structure will be activated and require special cutting methods (non-thermal) and will require disposal as LLRW and possibly LLMW from lead, PCB and asbestos contamination. This needs to be addressed.
92	General			The challenge of controlling the RCs as High Radiation Areas when they are opened for separation (alt. 1) or complete dismantle (alt. 3) have not been discussed and present a need for unique control processes and facilities. Please address.
93	General			Commercial facilities will need to develop radiological administrative processes such as training, emergency response and dose monitoring. Please address.
94	General			A table should be added showing comparison betweem NNPP and NRC radiological requirements showing differences.
95	General			If the Navy selects complete commercial disassembly as the best alternative will the Navy readdress its current operation of accomplishing submarine RCD? If complete commercial disposal is the best action to keep shipyards focused and performing fleet maintennace, can be done cost effectively and within NRC exposure and disposal requirements why continue submarine RCD?

Comment Document #30

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6693

Submit Date: 8/29/2022 6:31 PM

Who are you representing? Individual

Organization/Affiliation:

Full Name: K[redacted] KOEMMPEL

Address: [redacted]

Comment:

30.1 29 Aug. 2022 Section 3, Page 3.1-19 middle of the page states "For the purpose of estimating the collective dose for the commercial dismantle of ex-Enterprise under Alternative 3 (Preferred Alternative), the workforce and project duration estimates were selected from the commercial dismantle cost estimate (Chilton et al., 2019)." The Chilton reference is listed in section 7, page 7-2 and states that Cost estimate for commercial dismantlement and disposal of CVN 65. Arlington, VA: The Center for Naval Analysis. I have searched the Center for Naval Analysis website and extensively on the internet and have not been able to locate or obtain this cost estimate. Please provide access to or a copy of this reference. This reference is necessary to properly review Alternative 3. Respectfully, Ken Koemmpel [redacted]

Comment Document #31

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6688

Submit Date: 8/22/2022 8:09 AM

Who are you representing? Individual

Organization/Affiliation:

Full Name: M[redacted]

Address: ,, , , , United States

Comment:

31.1 The Navy (Public Shipyards), should be the sole organization responsible for dismantling and disposing of NNPP activity and reactors, not a for-profit company that may cut corners. Invest in public shipyards, expand the workforce and increase their capabilities to defend the USA against Russia / China. Or tow it to the south china sea and use it for target practice and save the taxpayers 2 billion dollars.

Comment Document #32

From: B[redacted]McElroy
To: Info_carrierdisposaleis_com
Cc: [redacted]
Subject: Enterprise disposal
Date: Thursday, September 8, 2022 3:02:49 PM

[redacted]

[redacted]

32.1 Having spent a good
Portion of my young life on the Big E I would like to have a memento piece of it.
I have 10
Squadron mates who also would
Like a part. We spent 8
Months off the coast of Vietnam and worked hard at our assigned duties.
A small piece of the ship seems to be the least we could ask for rather than
Have it made into razor blades.
B[redacted]McElroy
Cell [redacted]

Sent from my iPhone

Comment Document #33

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6706
Submit Date: 9/11/2022 12:15 PM
Who are you representing? Individual
Organization/Affiliation:
Full Name: R[redacted] Pensa
Address: [redacted]
Comment:
33.1 For all that money to be wasted on scrapping her, why not REFIT her making her state of the art and send recommission her

Comment Document #34

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6746

Submit Date: 9/29/2022 4:26 PM

Who are you representing? Individual

Organization/Affiliation:

Full Name: D[redacted]Poteat

Address: [redacted]

34.1 **Comment:** Why not have a plan to sink the ship at a location in the Gulf, off of the coast of Alabama, that has at least 150 feet of water. It would make a beautiful artificial reef with many benthic communitiy dwellers and a dive spot for scuba divers. An example would be the Oriskany that was scuttled off of Florida a few years ago..

Comment Document #35

Public Comment Form

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and its Associated Naval Reactor Plants Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS)

Thank you for your comments on the Draft EIS/OEIS.

Please use this form to record your comments on the Draft EIS/OEIS. Comments must be postmarked or received online by the end of the day on Oct. 3, 2022, for consideration in the Final EIS/OEIS.

Please provide comments that are substantive to the accuracy and adequacy of the draft environmental impact analysis.

Please Print

35.1 1) Though not identified as one of the three possible locations for decommissioning, would the Navy consider the former Naval Shipyard at Charleston, SC (now owned by Detyens) an option for decommissioning the Enterprise?

35.2 2) Please provide the Navy Cost Estimate (2019 or more recent) identified in Table ES-2: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 (Page ES-13) for further analysis.

35.3 3) Perma-Fix strongly supports the Preferred Alternative #3 for commercial remediation and dismantlement.

Name: C[redacted] Reno

Organization/Affiliation: Perma-Fix Environmental Services

Address:* [redacted]

City, State, Zip Code:* [redacted]

Please mail this completed form or submit comments online by the end of the day on **Oct. 3, 2022**, to:

Office of Congressional and Public Affairs
Attn Ex-Enterprise CVN 65 Draft EIS/OEIS
Puget Sound Naval Shipyard & Intermediate Maintenance Facility
1400 Farragut Ave., Stop 2072 Bremerton,
WA 98314-2072

*Provide your mailing address to receive further notices about the EIS/OEIS.

Visit **www.carrierdisposaleis.com** for project information.

Comment Document #36

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6736

Submit Date: 9/22/2022 3:51 PM

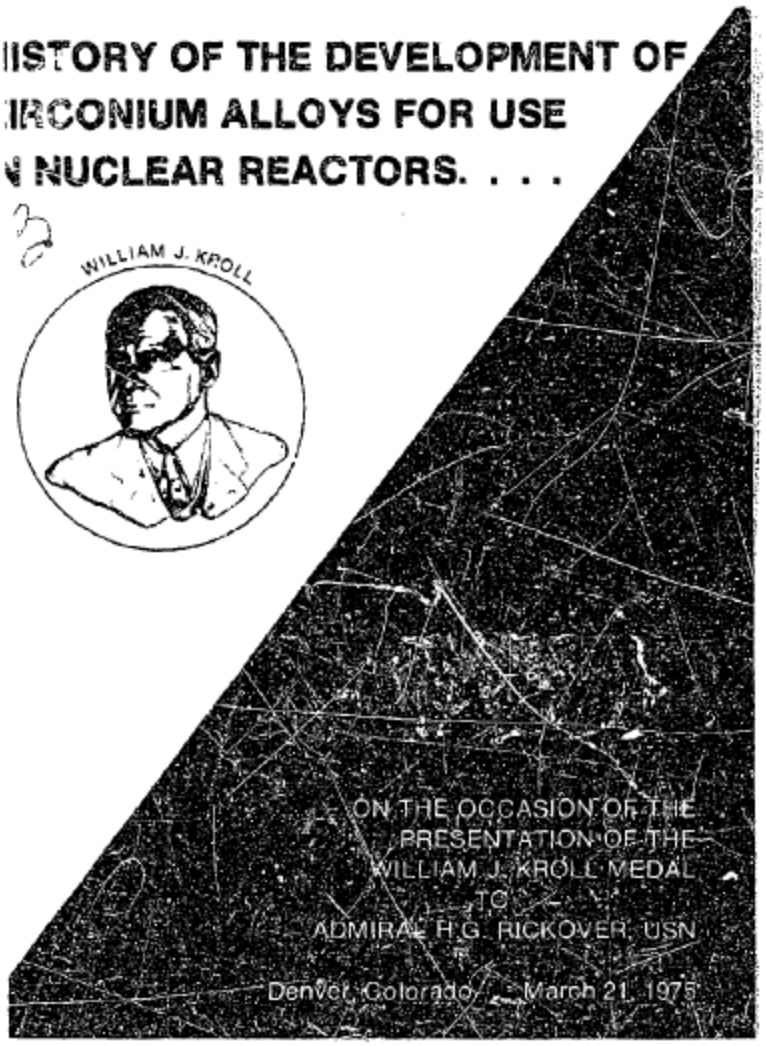
Who are you representing? Individual

Organization/Affiliation:

Full Name: M[redacted] RICHARDS

Address: [redacted]

Comment:
36.1 Here is a bit of historical perspective for your work as regards Admiral H.G. Rickover "the father of Naval nuclear propulsion" comments as he received the Kroll Medal in 1975 entitled: "History of the development of zirconium alloys for use in nuclear reactors" (see attached)


ISTORY OF THE DEVELOPMENT OF
IRCONIUM ALLOYS FOR USE
NUCLEAR REACTORS. . . .
WILLIAM J. KROLL
ON THE OCCASION OF THE
PRESENTATION OF THE
WILLIAM J. KROLL MEDAL
TO
ADMIRAL H.G. RICKOVER, USN
Denver, Colorado March 21, 1975

Comment Document #37

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6735
Submit Date: 9/22/2022 1:58 PM
Who are you representing? Individual
Organization/Affiliation:
Full Name: M[redacted]RICHARDS
Address: [redacted]
Comment:

37.1 In future EIS/OEIS proceeding it would seem useful to consider an alternative where the vessel in question could be utilized with some modificaton as a "power source" in its moored configuration similar to what Russia has been doing for some of its more isolated northern coastal cities. A reasonable person can see that one approach might be feasibility studies with/by DOE the US Navy (Naval Nuclear Propulsion Program) & Idaho National National Laboratory to PRESERVE electrical power/steam generating capacity that we are currently burying, which of course is a long term liability. Problematically, available amounts of sufficiently enriched fissile materials may be an issue, OTOH, perhaps the propulsion reactor designs could used effectively at lower enrichment. We might expect that our nation could bring significant generating capacity on-line in shorter time than building from scratch in the normal regulatory startup process. (perhaps because of non-military safety requirements) These reactors could be operated on Military reservations or possibly other, new secure cantonments.

Comment Document #38

From: P[redacted]Sayles
To: Info_carrierdisposaleis_com
Subject: Enterprise Disposition
Date: Friday, August 26, 2022 5:08:49 AM

[redacted]

38.1 I concur with the proposed civilian shipyard to dismantle the ship. While keeping PSNSY available for USN work, it will keep a commercial shipyard operational for the length of the demolition. It will be good for the commercial sector and free the Navy to concentrate on operational requirements.

P[redacted]Sayles, MSIR
SCPO USN (Ret)

Sent from Mail for Windows 10

Comment Document #39

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6699

Submit Date: 9/7/2022 10:59 AM

Who are you representing? Individual

Organization/Affiliation:

Full Name: G[redacted]Stitt

Address: [redacted]

Comment:
39.1 The historical lessons learned on scrapping nuclear ships areas is that nuclear particles will be found through - out the entire ship. for example It will be found on air ducts, ladders, ledges all through the ship. The company that will perform the tear apart CVN-65 must teach workers on how to look for nuclear waste in crevices , air ducts, and man other areas that collect dust. The government must ensure the workers are protected from nuclear waste...

Comment Document #40

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6686

Submit Date: 8/19/2022 10:23 AM

Who are you representing? Individual

Organization/Affiliation:

Full Name: G[redacted]Stitt

Address: [redacted]

Comment:
40.1 Ex-Enterprise CVN 65 is a significant undertaking. Considering the capabilities of PSNS and it's capabilities and the areas where we can stow the reactors in Washington State. PSNS has significant expertise in doing just that. This cannot be a funding issue rather the focus should be on safety!! PSNS has the skills and capabilities.

Comment Document #41

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6703

Submit Date: 9/10/2022 1:52 PM

Who are you representing? Individual

Organization/Affiliation:

Full Name: J[redacted] Tillman

Address: [redacted]

Comment:

41.1 Having personally served on the U.S.S. Enterprise, for almost four years, I think I have a viable solution, that would save millions and could possibly make millions: 1. Locate a suitable geographical location, off a major waterway, deep enough to float the Big E., to a place where a large basin can be dug. There are several ways the ship could be safely and permanently placed. Not only could the basin be lined with an impermeable permanent barrier to protect the enviroment (including test wells and French drains), but once once the ship is lightened, and in place, flooding the double hull would allow the ship to rest safely on the bottom. Once the ship is secure, the flooded double-hull-compartments can then be safely removed, permanently locking the hull in place. 2. Raise private funds to cover the cost of the move. As a small child, I gave my lunch money to help pay for the U.S.S. Alabama BB 60"s move from Bremerton, WA to Mobile, AL, where it permanently rests today. It's a major tourist attraction. I still have personal letters stuck in lagging (a time capsule), I placed there 40 years ago. I'm sure, of the thousands of sailors who served on the ship, many would love to see the Big E turned into a profitable museum. How many times has the sailing ship U.S.S. Constitution been visited, much less how much money has been raised over the years? After all, "it's the first nuclear powered aircraft carrier." Most of all, it would be a viable solution to NOT dealing with any radioactive problems, due to dismantling the ship. It would be so much easier to inert, encase, and mitigate any long term concers about radiation.. Weigh the cost!

Comment Document #42

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6751

Submit Date: 10/3/2022 12:22 PM

Who are you representing? Organization / Affiliation

Organization/Affiliation: BMTC

Full Name: W[redacted]Ungren

Address: ,, , , , United States

Comment:

42.1 Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) has a highly trained and detail oriented workforce. PSNS & IMF employees train extensively for performing radiological work, radiological control work, and hazardous waste work. This includes packaging and disposal of radioactive and/or hazardous waste and total reactor packages. They are experienced in Naval Nuclear Reactor disposal processes and procedures and already have had experience in Reactor Compartments with common bulkheads on the Ex-Triton, the Ex-Truxton, Ex-Bainbridge, Ex-Long Beach and many others. This extensive training is a cost already paid for by the American taxpayer. These previous work projects included the same or similar environmental and radiological issues and concerns as are expected with the Enterprise. Experience in previous projects has included engineering, designing, and building new containment packages for shipping and disposal that did not exist before. It was a tremendous task due to the engineering specifications required. The Enterprise will require engineering, designing, and building of new containment packages for shipping and disposal of the Reactor Compartments as either twin packages or singular packages. Such packages currently do not exist, but have been looked at by personnel here at PSNS. It will also be a tremendous task for the same reasons and the Enterprise's packages will be larger. Bremerton Metal Trades Council is wary of a for-profit company engineering, designing and building containment packages for shipping and disposal to the engineering specifications required and to make a profit on the venture. There is also a question of physical security. While it is true that Puget Sound Naval Shipyard and Intermediate Maintenance Facility is not far from the international border with Canada, not as much is heard about a "border crisis" with Canada or government corruption and influence from various drug cartels. There is also not the rampant illegal immigrant migrations from various countries, including some that wish to spread terrorism, that go through Canada like there is through Mexico to reach the United States. Many of the components and systems aboard Enterprise are still classified information. Additionally, there is likely to be inclement weather conditions in alternate locations. Tornadoes are a very rare occurrence in the Pacific Northwest, and when the do occur, they are mild in comparison. There are never hailstones as large as baseballs. Although there was one EF3 rated tornado in 1972. Texas also had one EF3 rated tornado in 1972, along with 20 EF2 rated and a total of 145 tornadoes. The Pacific Northwest has never had a hurricane, they are impossible; the water is too cold. BMTC is also concerned with what working conditions will be encountered by the contractor's employees. The contractor who is the lowest bidder is probably not very likely to provide good working conditions and facilities to the workers nor are they going to get the best workers. There is also a concern that the contractor with the lowest bid will not use workers that are not a security risk to the country to cut corners and save money.

Comment Document #43

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6717
Submit Date: 9/15/2022 4:26 AM
Who are you representing? Individual
Organization/Affiliation:
Full Name: [redacted]n Van Warrebey
Address: [redacted]

43.1 **Comment:** Forgive me if this is already outlined in one of the existing proposals, but it is my understanding that in large part, why it is likely PSNS will not land this project is due to the personnel and resource shortages for a 15-year commitment to the dismantling of ex-Enterprise, perhaps the following can be supported. Just as with ex-Long Beach, PSNS can keep ex-Enterprise pierside between docked availabilities. Considering the multitude of plants this vessel has, in between Nimitz-class DPIAs in DD6 at Puget, ex-Enterprise can spend the time required in DD6 to support one plant's dismantling. Then be moved back to pierside for the next DPIA for a CVN-68 class. So while this would still take 15 years, it wouldn't be 15 consecutive years, and could still be supported with undoubted turnover and attrition, for both mechanics and radiological controls alike. In between each DPIA, the remaining plants would continue to go through half-lives, making later dismantling even better in terms of exposure reduction.

Comment Document #44

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6705
Submit Date: 9/11/2022 12:00 PM
Who are you representing? Individual
Organization/Affiliation:
Full Name:
Address: ,, , , , United States

44.1 **Comment:** Sell it to an ally that could use it as a carrier. Immediately save 10million/year and possibly still have it used against an enemy in a future war.

Comment Document #45

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants Draft EIS/OEIS Comment

Comment ID#: 6697
Submit Date: 9/6/2022 6:22 AM
Who are you representing? Individual
Organization/Affiliation:
Full Name:
Address: ,, , , , United States

45.1 **Comment:** These ships should be dismantled in Puget Sound, and the reactors should be disposed at Hanford. No other places have the experience necessary for doing this work

REFERENCES

Naval Nuclear Propulsion Program. (2022). *Occupational Radiation Exposure from U.S. Naval Nuclear Plants and Their Support Facilities*. Washington, D.C.: Department of the Navy.

U.S. Department of Energy. (2006, 19 July 2006). [Knolls Atomic Power Laboratory-S1C Site, Windsor, CT; Tentative Determination of RCRA Corrective Action Completion and Unrestricted Land Transfer Under the Connecticut Property Transfer Act].

U.S. Nuclear Regulatory Commission. (2000). *Multi-Agency Radiation Survey and Site Investigation Manual (Marssim)* (NUREG-1575, Rev. 1). Washington, D.C.: U.S. Environmental Protection Agency, Department of Energy, Department of Defense, U.S. Nuclear Regulatory Commission.

Environmental Impact Statement/ Overseas Environmental Impact Statement

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants

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Appendix D Consultation Correspondence

This appendix contains correspondence between the Navy and relevant federal and state agencies during consultation under the Endangered Species Act, Magnuson-Stevens Fishery Conservation and Management Act, and Coastal Zone Management Act.

D.1 Endangered Species Act

D.1.1 National Marine Fisheries Service

D.1.1.1 Navy Request Letter for Informal Consultation

DEPARTMENT OF THE NAVY
PROGRAM EXECUTIVE OFFICER
AIRCRAFT CARRIERS
614 SICARD STREET SE
WASHINGTON NAVY YARD, DC 20376-7007

IN REPLY REFER TO
4560
312/161
13 Oct 2022

Mr. Ron Salz
National Marine Fisheries Service
Office of Protected Resources Headquarters
1315 East-West Highway
Silver Spring, Maryland 20910

Dear Mr. Salz:

SUBJECT: ENDANGERED SPECIES ACT SECTION 7 INFORMAL CONSULTATION FOR THE TOWING OF THE DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65)

The United States (U.S.) Department of the Navy (Navy) has developed the enclosed Endangered Species Act (ESA) Section 7 informal consultation document for the proposed towing of the decommissioned, defueled U.S. Ship Enterprise aircraft carrier (CVN 65) from its current location at Newport News, Virginia to a commercial dismantling facility in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama. The purpose of the Proposed Action is to reduce the Navy inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy.

This informal consultation addresses the potential effects of the Proposed Action on species listed as endangered or threatened under the ESA, and their designated critical habitat, under the purview of the National Marine Fisheries Service (NMFS). The Proposed Action has the potential to affect ESA-listed fish and sea turtle species in the origination port of Newport News and destination ports of Brownsville or Mobile.

This consultation analyzes only the potential effects of towing ex-Enterprise from the port of Newport News to the port of Mobile. A long distance tow would not be required if ex-Enterprise is dismantled in a facility within the Hampton Roads Metropolitan Area, so that scenario is not considered in the consultation. The Navy has completed prior consultations with NMFS for similar towing activities to the Proposed Action. On March 4, 2019, NMFS issued the *Programmatic Biological and Conference Opinion on the Towing of Inactive U.S. Navy Ships from their Existing Berths to*

Subj: ENDANGERED SPECIES ACT SECTION 7 INFORMAL CONSULTATION FOR THE TOWING OF THE DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65

Dismantling Facilities or other Inactive Ship Site, which concluded that the towing of inactive Navy ships would not likely adversely affect ESA-listed species potentially occurring at the Port of Brownsville. Therefore, this consultation does not consider potential effects in Brownsville. Accordingly, this consultation will analyze effects on ESA-listed species in the origination port of Newport News (brackish) and destination port of Mobile (brackish).

The Navy requests your concurrence that the towing of ex-Enterprise may affect, but is not likely to adversely affect, the ESA-listed Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and associated critical habitat, Gulf sturgeon (*Acipenser oxyrinchus desotoi*), shortnose sturgeon (*Acipenser brevirostrum*), green sea turtle North Atlantic distinct population segment (DPS) (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), Kemp's ridley sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), and loggerhead sea turtle Northwest Atlantic Ocean DPS (*Caretta caretta*).

I am requesting that you review the enclosed information and provide us with your comments and/or concurrence with our determinations in accordance with Section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*). If you have any technical questions, please feel free to contact [redacted]

Sincerely,

DUFF.HERBERT.RAYMOND.1120066281

Digitally signed by DUFF.HERBERT.RAYMOND.1120066281
Date: 2022.10.12 15:58:50 -04'00'

H.R. DUFF
APM, Inactivation
By Direction

Enclosure. 1. Endangered Species Act Section 7 Informal Consultation for the Towing of the Decommissioned, Defueled Ex-Enterprise (CVN 65)

2

D.1.1.2 National Marine Fisheries Service Concurrence Response

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

3/15/23

Refer to NMFS No: OPR-2022-02807

H.R. Duff
APM, Inactivation
Department of the Navy
[redacted]

RE: Concurrence Letter for the Endangered Species Act Section 7 Informal Consultation for the Towing of the Decommissioned, Defueled Ex-Enterprise (CVN 65)

Dear Mr. Duff:

The National Marine Fisheries Service (NMFS), Office of Protected Resources, Endangered Species Act (ESA) Interagency Cooperation Division (hereafter referred to as "we" or "us") received your October 14, 2022 request for concurrence with the U.S. Navy's determination that the proposed towing of the ex-Enterprise aircraft carrier from its current location in Newport News, Virginia to a commercial dismantling facility (either Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama), may affect but is not likely to adversely affect any ESA-listed species or designated critical habitat. This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at (50 CFR §402), and agency guidance for preparation of letters of concurrence.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with agency guidelines issued under section 515 of the Treasury and General Government Appropriations Act of 2001 (Data Quality Act; 44 U.S.C. 3504(d)(1) and 3516). A complete record of this informal consultation is on file electronically with the NMFS Office of Protected Resources in Silver Spring, Maryland.

Background and Consultation History

The Navy Inactive Ships Office first requested consultation under section 7 of the ESA for the towing of inactive Navy ships in August 2012. Between 2012 and 2016, we completed five informal consultations on Navy inactive ship tow events. Each of these consultations concluded that the Navy's proposed action to tow inactive ships was not likely to adversely affect ESA-listed species and would not destroy or adversely modify designated critical habitat. In August

2016, we completed informal consultation on the towing of the inactive ex-Independence from Bremerton, Washington to Brownsville, Texas. The Navy complied with NMFS's request to clean the hull of the ex-Independence prior to towing to minimize the risk associated with potentially transferring invasive species from the origination port to the destination port.

In March 2019, we issued the Programmatic Biological and Conference Opinion on the Towing of Inactive U.S. Navy Ships from their Existing Berths to Dismantling Facilities or other Inactive Ship Site (NMFS 2019). The 2019, programmatic biological opinion analyzed the effects of towing inactive Navy ships on ESA-listed species and designated critical habitat for multiple towing scenarios involving different combinations of origin and destination ports. While Newport News, Virginia was not one of the origination ports considered, the nearby port of Norfolk, Virginia was analyzed as part of the 2019, programmatic opinion. Of the three potential dismantling facility sites for the Navy's proposed action, only Brownsville, Texas was analyzed as a destination port in the 2019, programmatic opinion.

As part of the Navy's proposed action for the 2019, programmatic consultation, the Navy committed to implement hull cleaning methods for certain tow scenarios (i.e., like-to-like port salinity environments) as a mitigation measure to minimize the risk of invasive species transfer (NMFS 2019). The Navy also agreed, to the maximum extent practicable, to schedule any in-water hull cleanings in Norfolk, Virginia from November 1 through February 28, to minimize impacts to adult Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) during spawning migrations and the seasonal occurrence of sea turtles in Chesapeake Bay that may result from the in-water hull cleaning process (e.g., water quality, sediment contamination, turbidity, noise) (NMFS 2019).

The history of this consultation is as follows:

- On March 16, 2022, Navy and NMFS staff met via phone call to discuss options for ESA section 7 consultation on the anticipated towing of the decommissioned ex-Enterprise. The Navy indicated that the potential tow routes for this action were not ones that were analyzed in the 2019 programmatic biological opinion. Options discussed included reinitiation of the programmatic to include the new tow route scenarios as part of the proposed action, or to conduct a separate consultation outside of the programmatic.
- On September 8, 2022, Navy and NMFS staff met via phone call to discuss the timeline for an ESA section 7 informal consultation on the towing of the ex-Enterprise.
- On October 14, 2022, the Navy emailed NMFS a letter requesting concurrence on the Navy's determination that the towing of the ex-Enterprise may affect, but is not likely to adversely affect, the following ESA-listed species and critical habitats: Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and associated critical habitat; Gulf sturgeon (*Acipenser oxyrinchus desotoi*); shortnose sturgeon (*Acipenser brevirostrum*); green sea turtle North Atlantic distinct population segment (DPS) (*Chelonia mydas*); hawksbill sea turtle (*Eretmochelys imbricata*); Kemp's ridley sea turtle (*Lepidochelys kempii*); leatherback sea turtle (*Dermochelys coriacea*); and loggerhead sea turtle Northwest

Atlantic Ocean DPS (*Caretta caretta*). The email included an attached document with support for the Navy's determination (Navy 2022).

- On November 2, 2022, we responded to the Navy via email indicating that we had reviewed the consultation package for the towing of the ex-Enterprise and determined that it contained all the information needed to proceed with ESA section 7 informal consultation.
- On November 2, 2022, email also included recommended revisions regarding the Navy's species list and species determinations. While the submitted consultation package mentions ESA-listed offshore species of whales and elasmobranchs, the Navy did not request concurrence that the proposed action may affect but is not likely to adversely affect these offshore species. We reached an NLAA determination for these offshore species in the 2019, programmatic biological opinion, and we believe NLAA is the correct determination for the Navy's proposed action. We also suggested that the Navy add the scalloped hammerhead (*Sphyrna lewini*) Central and Southwest Atlantic DPS to their list of species for which there are requesting concurrence on their NLAA determination.
- On November 4, 2022, the Navy emailed us indicating that they agreed with the species list and species determination recommendations we provided in our November 2 email.
- On November 18, 2022, the Navy emailed us with a requested completion date for the section 7 informal consultation on the Navy's proposed towing of the decommissioned ex-Enterprise vessel of March 15, 2023. We responded that we approve of the requested date.
- On February 3, 2023, we provided the Navy with draft *Proposed Action* and *Action Area* sections of the ex-Enterprise towing LOC for Navy review. On February 10, 2023, the Navy responded with their comments and suggested edits on these LOC sections.
- On February 24, 2023, we emailed the Navy asking if they would add conservation measures to their proposed action to minimize the risk of vessel strike during towing. These measures would include the use of lookouts to avoid potential collisions with ESA-listed species, Navy Marine Species Awareness Training for towing operators, increased vigilance and taking reasonable and prudent actions when marine mammals or sea turtles are sighted, and recording interactions with ESA-listed species.

In August 2019, the USFWS and NMFS (i.e., the Services) enacted a series of regulations that modified how the Services implemented the ESA. On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The District Court issued a slightly amended order two days later on November 16, 2022. As a result, the

2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the letter of concurrence would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

Proposed Action

The U.S. Navy proposes to tow the ex-Enterprise aircraft carrier from its current location at Newport News, Virginia to one of three commercial dismantling facilities: Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama. Dismantling and towing would be conducted by private contractors in accordance with all federal, state, and local laws and regulations (Navy 2022).

If the Navy awards a contract to a commercial shipyard facility in the Hampton Roads Metropolitan Area, transport of the ex-Enterprise would be limited to a short-distance tow by tugboats at low speeds entirely within the Chesapeake Bay and its tributaries. If the destination port is in the Gulf of Mexico (i.e., Brownsville or Mobile), the most likely towing route would track offshore to remain outside the main axis of the Gulf Stream, nearing the coast approaching Cape Hatteras, and passing through the Florida Strait before entering the Gulf of Mexico (Navy 2022). The duration of the tow would be approximately 12 days in good sea state. Towing the ex-Enterprise from its current mooring location to Brownsville would cover approximately 2,200 miles (mi; 3,541 kilometers [km]). Towing the ex-Enterprise to Mobile would cover approximately 2,106 mi (3,389 km). The tow route would be almost entirely within the U.S. Exclusive Economic Zone. During transit, the tug and tow would typically travel at speeds less than 10 knots in the open ocean. Speed would be reduced while in port areas (Navy 2022).

The tow cable is typically about 2,500 feet (ft; 762 meters [m]) long, consisting of 3-inch (in; 8 centimeter [cm]) diameter wire rope. While underway, the catenary of the tow cable may reach 100 ft (30 m) below the surface; the tug would maintain approximately 75–150 tons (68–136 metric tons) of strain on the cable, depending on the speed of advance and weather conditions (Navy 2022).

As part of the proposed action, the Navy will follow standard operating procedures and implement protective measures that would likely benefit ESA-listed resources. Applicable navigation requirements include that ships maintain a proper lookout at all times to be alert for collision risks, and that ships proceed at a safe speed at all times so that proper and effective action can be taken to avoid collision (Navy 2022). The commercial tow vessel operator will ensure that the tug maintain a lookout at all times to minimize the risk of collision (Navy 2023). In addition, during the proposed tow of the ex-Enterprise, a Navy escort vessel with at least one MSAT-trained lookout would accompany the commercial tow vessel (Navy 2023).

If the selected destination port is either Brownsville or Mobile, the following protective measures will be implemented to reduce or minimize potential adverse effects to ESA-listed species and critical habitat: 1) prior to towing, the Navy will clean the hull of the ex-Enterprise to reduce the

potential for species attached to the hull to be transported and introduced to areas outside of their natural range, which could have negative effects on ESA-listed species and their habitats if not mitigated, and 2) the Navy would, to the maximum extent practicable, schedule any in-water hull cleaning from November 1 through February 28 in order to reduce potential effects to adult Atlantic sturgeon (present during spawning migrations) and sea turtles (seasonally present in Chesapeake Bay) (Navy 2022).

For either of the ship tow scenarios involving hull cleaning of the ex-Enterprise (i.e., destination port is Brownsville or Mobile) the Navy contractor would tow the ship as soon as practicable upon completion of hull cleaning (R. Johnson, Navy, pers. comm. to R. Salz, NMFS, October 17, 2018). This measure is intended to minimize the attachment of hull fouling organisms during the period between completion of hull cleaning and initiation of the ship tow, thus maximizing the effectiveness of hull cleaning mitigation in reducing the risk of invasive species spread.

There are three potential hull cleaning methods available to the Navy: 1) dry docking long enough to allow species on the hull to "die-off" through desiccation, 2) hull-cleaning while the ship is in dry dock, or 3) in-water hull cleaning (Navy 2018b). In accordance with the Uniform National Discharge Standards (85 FR 43465), in scenarios where hull cleaning mitigation is required the Navy would give first consideration to one of the dry dock methods for cleaning the hull of the ex-Enterprise (Navy 2018d). This regulatory framework states: "Vessel hulls must be inspected, maintained, and cleaned to minimize the removal and discharge of antifouling hull coatings and transport of fouling organisms. To the greatest extent practicable, rigorous vessel hull cleanings must take place in dry dock or at a land-based facility where the removed fouling organisms or spent antifouling hull coatings can be disposed of onshore in accordance with any applicable solid waste or hazardous substance management and disposal requirements" (85 FR 43465). Dry docking would be the first method considered, though this method would only be implemented if there is a sufficiently sized dry dock available during the required timeframe that is in close enough proximity to the origination port to preclude risk of invasive species transfer (Navy 2018d). Factors that could limit dry dock availability include: (1) limited Department of Defense or private contractor dry docks in existence, even more so for those of a sufficient size to accommodate larger vessels, particularly aircraft carriers, (2) priority is always placed on active duty vessels for national defense and mission readiness, which includes both regularly scheduled maintenance and upgrades as well as emergent situations, (3) priority is also placed on dry dock maintenance and certification over the inactive fleet, and (4) the cost of private dry dock usage could significantly exceed the cost of other mitigations available (e.g. in-water hull cleaning) (Navy 2018d).

In scenarios where hull cleaning mitigation is required, if dry dock hull cleaning were not feasible the Navy would conduct in-water hull cleaning of the ex-Enterprise at the current mooring location. In-water hull cleaning would involve removal of hull-fouling organisms and biofouling communities using underwater hull cleaning methods and equipment specified in the Navy Ship's Technical Manual (NSTM) Chapter-081, "Waterborne Underwater Hull Cleaning

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of Navy Ships" (Naval Sea Systems Command 2006) and the agreements made between the Navy and NMFS during the 2019 programmatic consultation on the towing of inactive ships (NMFS 2019). This manual provides a description of the various tools, such as diver-operated machines with rotating brushes, either multi-brush or single-brush fitted with different brush types depending on the machine and fouling conditions present. Professional divers would clean the hull using one or more of the following: hand-held or self-propelled rotary equipment (e.g., brushes or waterjets); hand-held water jets and hydro-lance equipment; manual hand tools (e.g., scrapers, pads, and brushes); and other similar industry-recognized equipment. The Navy Ship's Technical Manual requires divers to inspect the hull and select the appropriate brush for the fouling condition (Naval Sea Systems Command 2006). Multi-brush units are used to clean large, unobstructed, easily accessible areas of the hull. These are fitted with rotary cleaning heads (e.g., brushes) that sweep the growth off the hull. The units are typically held against the hull with either a high-volume impeller or the suction generated by brush rotation, and ride along the hull on a set of wheels. Single-brush units are held in place by the diver and the suction force generated from the rotating brush, and they are used to clean appendages and hull areas that the large multi-brush unit cannot access. For areas that are harder to reach, divers employ high-pressure water jets, hydro-lances, and hand tools (e.g., scrapers, pads, and brushes). The primary goal would be to remove fouling safely and efficiently with minimal impact to the underlying hull coating system. The in-water hull cleaning methods are not expected to result in the scraping of all hull areas down to the bare hull. Divers are instructed to use the least aggressive tools necessary to effectively remove biofouling organisms in an attempt to minimize removal and release of paints and other coatings or damage to the physical integrity of the hull.

The Navy has committed to continually evaluate the various types of in-water hull cleaning technologies available (e.g., capture systems) in order to determine whether such methods are effective and feasible to implement in the future (Navy 2018c). If in-water hull cleaning is conducted on the ex-Enterprise, the Navy would, to the maximum extent practicable, use methods that minimize impacts to surrounding water bodies by collecting organisms, paint particles and other materials dislodged by the cleaning process for upland disposal (McClay et al. 2015).

Action Area

The proposed action area would include: 1) the origination port of Newport News, Virginia (Figure 1); 2) the destination ports of Brownsville, Texas, Mobile, Alabama, or one other port in the Hampton Roads Metropolitan Area; and 3) the tow routes shown in Figure 2. The actual area where the proposed action would take place will be somewhat smaller since only one destination port and one tow route would be used. However, since we do not know which destination port would be selected, we analyze the effects of the proposed action under the three different scenarios.

The origination port of Newport News, Virginia is located in the lower Chesapeake Bay at the mouth of the James River. Newport News is characterized as brackish water, with salinities

commonly ranging from 12.6 to 15 parts per thousand (ppt) (Chesapeake Bay Program 2022). Salinity levels within the Chesapeake Bay, the largest estuary in the United States, vary widely, both seasonally and from year-to-year, depending on the volume of incoming fresh water. Salinity levels tend to be lowest in spring when freshwater input is highest, and the dry fall season is when higher salinities occur (Chesapeake Bay Foundation 2020). The Newport News Shipbuilding facility is located in the mesohaline segment of the James River and experiences salinities that range from 10 to 20 ppt (Navy 2022).

The potential destination port of Mobile, Alabama is characterized as brackish, with patterns of higher salinities within the lower bay and lower salinities in the upper bay. Mobile Bay is a shallow and stratified estuary that is heavily influenced by river discharge (Du et al. 2018). Average surface salinity in Mobile Bay can be highly variable and is driven predominantly by freshwater inflow from the Mobile Bay watershed. A combination of winds and tidal regimes delivers saline Gulf waters into the Bay from the south. On rare occasions (during periods of low freshwater inflow and high tides), high-salinity bottom waters may reach more than 19 mi (30 km) upstream from the mouth of the Bay (Orlando 1993). Mobile Bay exhibits temporal trends of highest salinities between July and November, when low river discharges normally occur, and lowest salinities between January and May, when river discharges are at their maximum (USACOE 2019). Mean depth salinity values range from 23 to 26 ppt in October and 10 to 18 ppt in February due to varying amounts of salt intrusion from the Gulf of Mexico and river discharge from the watershed (USACOE 2019).

Brownsville is part of the Boca Chica subdelta of the Rio Grande. The Port is at the southern terminus of the Gulf Intracoastal Waterway near the mouth of the Rio Grande and Lower Rio Grande Valley plain. Brownsville is part of the Rio Grande River system, which flows from south-central Colorado and flows into the Gulf of Mexico. The salinity in Brownsville is around 34 to 37 ppt (Navy 2022; NMFS 2019).

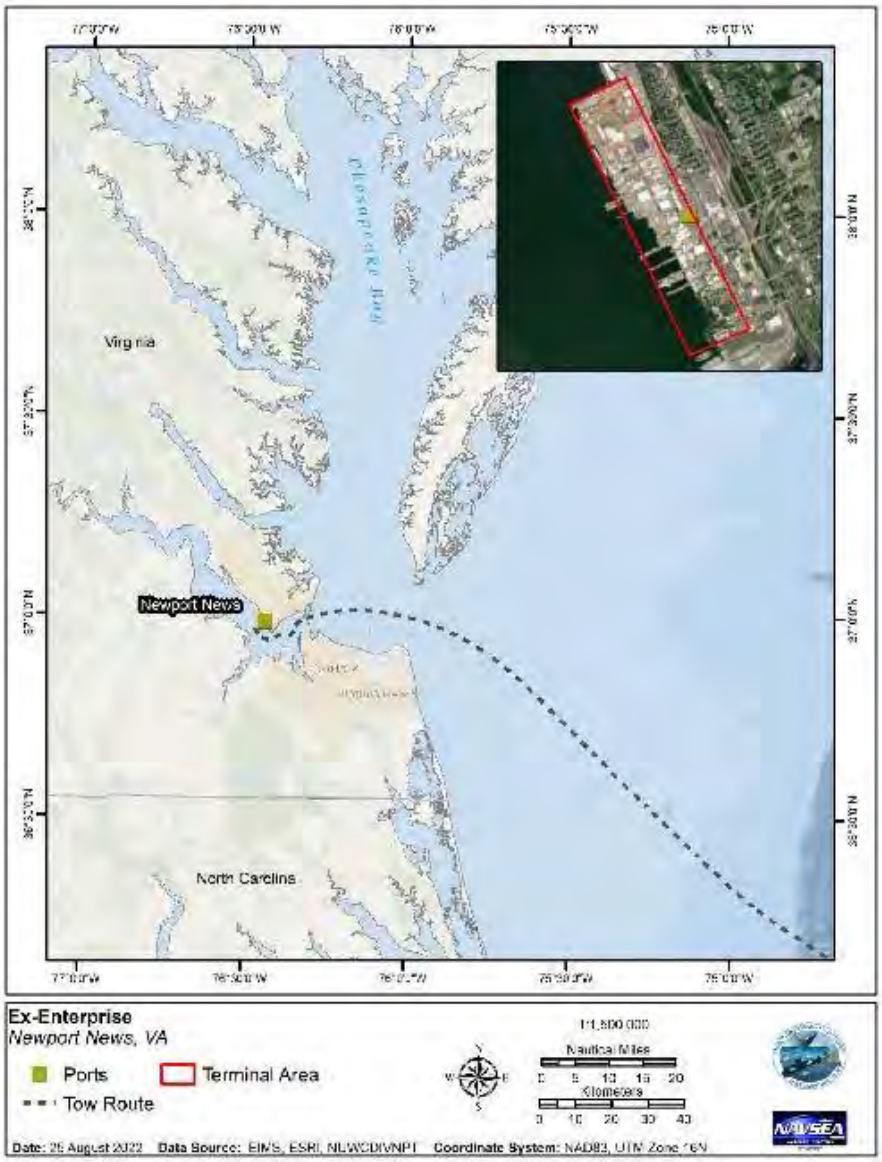


Figure 1. Origination Port of Newport News, Virginia (Navy 2022)

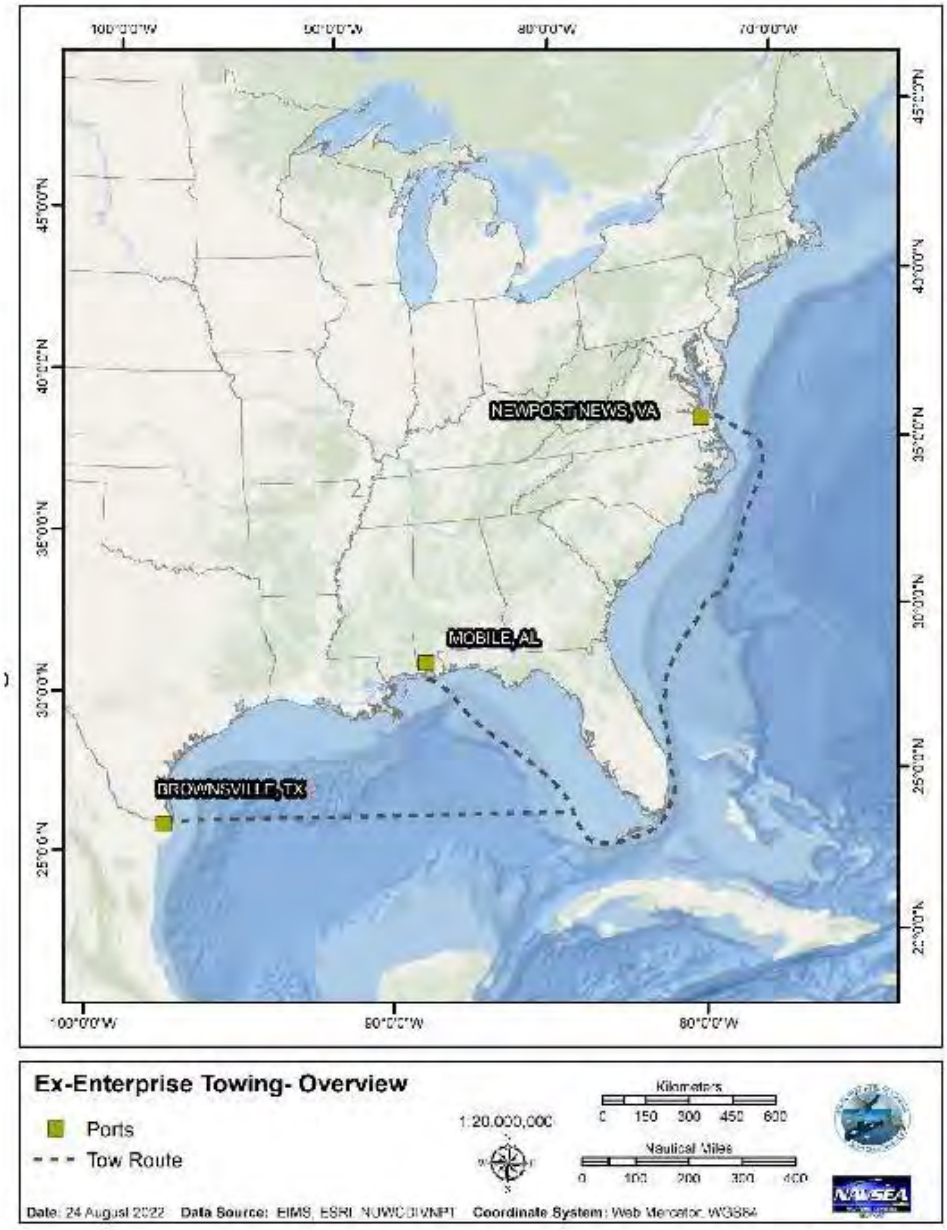


Figure 2. Proposed Tow Route from Newport News, Virginia to Brownsville, Texas or Mobile, Alabama (Navy 2022)

ESA-listed Species and Designated Critical Habitat that May Be Affected

The ESA-listed species and designated critical habitat within the action area that may be affected by the proposed action are shown in Table 1 below.

Table 1. ESA-listed Species and Designated Critical Habitat that May Be Affected by the Navy's Proposed Action

Species	ESA Status	Critical Habitat	Recovery Plan
Marine Mammals – Cetaceans			
Blue Whale (*Balaenoptera musculus*)	E – 35 FR 18319	-- --	11/2020
Fin Whale (*Balaenoptera physalus*)	E – 35 FR 18319	-- --	75 FR 47538 07/2010
Rice's Whale (*Balaenoptera ricei*, previously called Gulf of Mexico Bryde's whale)	E – 84 FR 15446 E – 86 FR 47022	-- --	-- --
North Atlantic Right Whale (*Eubalaena glacialis*)	E – 73 FR 12024	81 FR 4837*	70 FR 32293 08/2004
Sei Whale (*Balaenoptera borealis*)	E – 35 FR 18319	-- --	12/2011
Sperm Whale (*Physeter macrocephalus*)	E – 35 FR 18319	-- --	75 FR 81584 12/2010
Sea Turtles			
Green Turtle (*Chelonia mydas*) – North Atlantic DPS	T – 81 FR 20057	63 FR 46693*	10/1991 – U.S. Atlantic
Hawksbill Turtle (*Eretmochelys imbricata*)	E – 35 FR 8491	63 FR 46693*	57 FR 38818 08/1992 – U.S. Caribbean, Atlantic, and Gulf of Mexico
Kemp's Ridley Turtle (*Lepidochelys kempii*)	E – 35 FR 18319	-- --	03/2010 - U.S. Caribbean, Atlantic, and Gulf of Mexico 09/2011
Leatherback Turtle (*Dermochelys coriacea*)	E – 35 FR 8491	44 FR 17710 and 77 FR 4170*	10/1991 – U.S. Caribbean, Atlantic, and Gulf of Mexico
Loggerhead Turtle (*Caretta caretta*) – Northwest Atlantic Ocean DPS	T – 76 FR 58868	79 FR 39855	74 FR 2995 10/1991 – U.S. Caribbean, Atlantic, and Gulf of Mexico 01/2009 – Northwest Atlantic
Fishes			
Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) – Carolina DPS	E – 77 FR 5913	82 FR 39160*	3/2018- Outline

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Species	ESA Status	Critical Habitat	Recovery Plan
Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) – Chesapeake DPS	E – 77 FR 5879	82 FR 39160	3/2018- Outline
Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) – Gulf of Maine DPS	T – 77 FR 5879	82 FR 39160*	3/2018- Outline
Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) – New York Bight DPS	E – 77 FR 5879	82 FR 39160*	3/2018- Outline
Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) – South Atlantic DPS	E – 77 FR 5913	82 FR 39160*	3/2018- Outline
Giant Manta Ray (*Mobula birostris*)	T – 83 FR 2916	-- --	-- --
Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)	T – 56 FR 49653	68 FR 13370*	09/1995
Oceanic Whitetip Shark (*Carcharhinus longimanus*)	T – 83 FR 4153	-- --	9/2018- Outline
Scalloped Hammerhead Shark (*Sphyrna lewini*) – Central and Southwest Atlantic DPS	T – 79 FR 38213	-- --	-- --
Shortnose Sturgeon (*Acipenser brevirostrum*)	E – 32 FR 4001	-- --	63 FR 69613 12/1998

E=endangered; T=threatened; FR=*Federal Register*
* indicates that designated critical habitat does not overlap with the action area

Effects of the Action

Under the ESA, "effects of the action" are defined as all consequences to ESA-listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (Sec § 402.17).

An action warrants a "may affect, not likely to adversely affect" finding when its effects are wholly beneficial, insignificant or discountable. Beneficial effects have an immediate positive effect without any adverse effects to the species or habitat. Insignificant effects relate to the size or severity of the impact and include those effects that are undetectable, not measurable, or so minor that they cannot be meaningfully evaluated. Insignificant is the appropriate effect conclusion when plausible effects are going to happen, but because of the timing, location, duration, intensity, or frequency of the exposure, a response would not be detectable. Discountable effects related to the likelihood of exposure to a stressor, where that likelihood is so minimal as to be extremely unlikely to occur.

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Potential Stressors to ESA-listed Species

The proposed action involves multiple activities, each of which can create stressors. Stressors are any physical, chemical, or biological entity that may directly or indirectly induce an adverse response either in an ESA-listed (or proposed) species or their designated (or proposed) critical habitat. We deconstructed the proposed action to identify potential stressors that could result from the proposed activities. The effects of these potential stressors on ESA-listed species and designated critical habitat in the action area are discussed below.

The potential stressors that may result from the proposed action are:

1. Stressors associated with ships (tug and inactive ship) in transit from the origination port in Newport News, Virginia to the selected destination port including:
    - ship strike or physical disturbance; and
    - ship sound and behavioral disturbance.
2. Water and sediment quality and sound related stressors associated with shipbreaking/dismantling inactive ships at the destination port by ship dismantling contractors, including:
    - release of heavy metals associated with hull coatings, paints and other ship parts;
    - release of hazardous materials and other pollutants (e.g., polychlorinated biphenyls [PCBs], petroleum products, asbestos, waste water/sludge, and ozone depleting substances) commonly found in Navy ships;
    - increased turbidity; and
    - sound produced by shipbreaking/dismantling activities.
3. Water and sediment quality and sound related stressors associated with in-water hull cleaning mitigation conducted at the origination port, including:
    - release of copper, zinc and other contaminants associated with hull antifouling paints;
    - depression of dissolved oxygen (DO) from the decay of organic matter removed from the hull;
    - increased turbidity;
    - release of nutrients (nitrates, nitrites, and ammonia) which are precursors to reduction in DO and algal blooms;
    - resuspension of contaminants (e.g., PCBs and mercury) in bottom sediments where inactive Navy ship are docked;
    - changes in organic matter load, dissolved organic carbon (DOC), and biochemical oxygen demand (BOD); and
    - sound produced by in-water hull cleaning activities.
4. Stressors associated with the introduction of non-native species via ballast water exchange or hull fouling, including:
    - increased competition for food or available habitat;
    - increased predation;

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- altered prey availability due to ecosystem level trophic effects;
- changes in biological and physical environmental features including habitat structure and water quality; and
- increased exposure to harmful pathogens and parasites.

Effects on ESA-Listed Species Occurring in Deepwater, Pelagic Areas

Several of the ESA-listed species that may be present within the action area occur exclusively (or nearly so) in offshore or deepwater marine environments. These include the following: blue whale; fin whale; North Atlantic right whale; Rice's whale; sei whale; sperm whale; giant manta ray; oceanic whitetip shark; and scalloped hammerhead shark – Central and Southwest Atlantic DPS. It is extremely unlikely that any of these species would be exposed to stressors associated with the introduction of invasive species from inactive Navy ships. The Navy's proposed mitigation to clean the hull of the ex-Enterprise prior to towing in offshore areas (i.e., from Newport News, Virginia to either Brownsville, Texas or Mobile, Alabama) would effectively reduce the risk of invasive species transfer to a discountable level (NMFS 2019). In addition, given the slow tow speeds, it is highly unlikely that any hull-fouling species remaining on the hull after cleaning would release from the hull in offshore environments while the ship is in-tow, or that they would be able to survive and propagate in such a different environment from the origination port. Inshore, estuarine, and freshwater habitats are fundamentally different in ecological terms and we discount the ability of an invasive species to establish in offshore regions. Since none of these offshore species occur in (or in close proximity to) the origination port of Newport News or any of the potential destination ports, there would be no effect to these species or their habitats from in-water hull cleaning or ship dismantling activities.

Ship and tow line strike could potentially affect these offshore and pelagic ESA-listed marine mammals and fish species. Although the tug, tow cable, and towed ship may affect ESA-listed species encountered along the proposed tow route, the chance of such an encounter is extremely remote because of the low probability that an ESA-listed species would overlap with the ex-Enterprise tow path. The relatively low speed (less than ten knots) of the tug and tow further reduces the chance of a ship striking a large whale (Conn and Silber 2013; Jensen and Silber 2004; Laist et al. 2001; Vanderlaan and Taggart 2007). The majority of ship strikes of large whales occur when ships are traveling at speeds greater than approximately ten knots, with faster ships, especially of large ships (80 meters or greater), being more likely to cause serious injury or death (Conn and Silber 2013; Jensen and Silber 2004; Laist et al. 2001; Vanderlaan and Taggart 2007). In addition, both the commercial tow vessel and a Navy escort vessel would have a lookout aboard monitoring for ship collision risks at all times (Navy 2023), which further decreases the likelihood of the tow, tug or tow line striking a large whale. Ship strikes of elasmobranchs (i.e., giant manta rays, oceanic whitetip sharks or scalloped hammerhead sharks) are very rare in general, and their distribution in the water column further reduces the chance of a strike from the proposed action.

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The temporary disturbance of ESA-listed marine mammals and fish species associated with the anticipated ship interactions as part of the proposed action is not expected to result in injury or reduced fitness, as we do not anticipate any significant disruption of breeding, feeding, or sheltering to occur. Therefore, any potential effects from ship sound or ship avoidance behavior resulting from the proposed action would be undetectable, not measurable, or so minor that they cannot be meaningfully evaluated, and thus would be insignificant.

In summary, for the following offshore (or predominantly offshore) and pelagic species, we discount (i.e., extremely unlikely to occur) the exposure to invasive species and to ship strike, and find the potential effects from ship sound or ship avoidance behavior to be insignificant (i.e., undetectable, not measurable, or so minor that they cannot be meaningfully evaluated). As such, we determine that the proposed action may affect but is not likely to adversely affect the following ESA-listed species: blue whale; fin whale; North Atlantic right whale; Rice's whale; sei whale; sperm whale; giant manta ray; oceanic whitetip shark; and scalloped hammerhead shark – Central and Southwest Atlantic DPS. As such, these species are not discussed further in our effects analysis. Below, we address the effects of the proposed action on the ESA-listed sea turtles and sturgeon species (or DPSs) from Table 1.

Ship and Tow Line Strike and Physical Disturbance Effects Analysis

Ship and tow line strike could potentially affect ESA-listed sea turtles and sturgeon occurring within the action area. Turtles may use auditory cues to react to approaching ships rather than visual cues, making them more susceptible to strike as ship speed increases (Hazel et al. 2007). However, the chance of such an encounter is extremely remote because of the low probability that an ESA-listed species would overlap with the tow path. In addition, both the commercial tow vessel and a Navy escort vessel would have a lookout aboard monitoring for ship collision risks at all times (Navy 2023), which further decreases the likelihood of the tow, tug or tow line striking a sea turtle. The low tow speeds, especially while moving through port areas, would provide more opportunity for turtles to detect and avoid the ship. In the rare event that a sea turtle was within range to hear or see the tugboat towing the ex-Enterprise, we would expect the animal would exhibit avoidance behavior. Therefore, ship strike associated with the proposed action may affect, but is not likely to adversely affect, ESA-listed sea turtles in the action area.

Large ships that transit through shipping channels typically draft close to the bottom of the channel, which increases the likelihood of interactions with bottom-dwelling fish such as the ESA-listed sturgeon. The tow route originating in Newport News may overlap with sturgeon migratory routes to and from the James River. The Atlantic Sturgeon Status Review Team (ASSRT) determined that sturgeon in the James River are at a moderate risk from ship strikes (ASSRT 2007). Brown and Murphy (2010) examined 28 dead Atlantic sturgeon from the Delaware River from 2005 through 2008 and found that fifty percent of the mortalities resulted from apparent ship strikes, and 71% of these (10 out of 14) had injuries consistent with being

struck by a large ship. Shortnose sturgeon may not be as susceptible due to their smaller size in comparison to the larger Atlantic sturgeon, for which ship strikes have been documented more frequently. There has been only one confirmed incidence of a ship strike on a shortnose sturgeon in the Kennebec River, and two suspected ship strike mortalities in the Delaware River (SSSRT 2010). Gulf sturgeon may occur year-round within Mobile Bay and the surrounding marine waters, although they are considered rare in this region. We have no information indicating that ship strikes of Gulf sturgeon have occurred within the action area.

While ship strike remains a general threat to sturgeon within portions of the action area, the likelihood that the proposed action would result in a ship strike remains extremely low given the low tow speeds and the minimal time that the tug towing the ex-Enterprise would be in areas where an ESA-listed sturgeon strike may occur. The 50ft deep Port of Virginia, which includes three marine terminals (Norfolk International, Portsmouth Marine and Newport News Marine), is one of the major commercial shipping areas along the U.S. Atlantic coast. In 2017, total import/export throughput at the Port of Virginia was 2.84 million TEUs (twenty-foot equivalent unit) (POV 2018). In addition to commercial traffic, Norfolk's naval facility is one of the largest shipyards in the world. Therefore, a single tow event of an inactive ship represents an extremely small fraction of the total large ship activity at this port in any given year. Given the relatively small number of ESA-listed sturgeon that are struck by ships each year in the action area, a ship strike resulting from towing a single inactive ship, moving at a relatively slow speed, is extremely unlikely to occur, and thus would be discountable.

In summary, we have no information to indicate that ESA-listed sturgeon or sea turtles have been struck by towed inactive Navy ships in the past. Although the tug, tow cable, and towed ship may affect animals encountered along the proposed tow route, the chance that such an encounter would result in an adverse effect due to a strike is extremely remote due to the following: the slow speed of towing; the requirement to have lookouts on board; the expected low density of ESA-listed species along the tow route, and the low probability that an ESA-listed sturgeon or sea turtle would overlap with the tow path. Thus, we find that the effects of a ship or tow line strike to ESA-listed sturgeon or sea turtles are extremely unlikely to occur, and thus are considered discountable.

If the destination port is in the Gulf of Mexico (i.e., Brownsville or Mobile), the most likely towing route would track offshore to remain outside the main axis of the Gulf Stream, nearing the coast approaching Cape Hatteras, and passing through the Florida Strait before entering the Gulf of Mexico (Navy 2022). This tow route could overlap with loggerhead sea turtle Northwest Atlantic DPS designated critical habitat: breeding habitat unit off south Florida, and *Sargassum* habitat unit off south Florida and in the Gulf of Mexico (Figure 3).

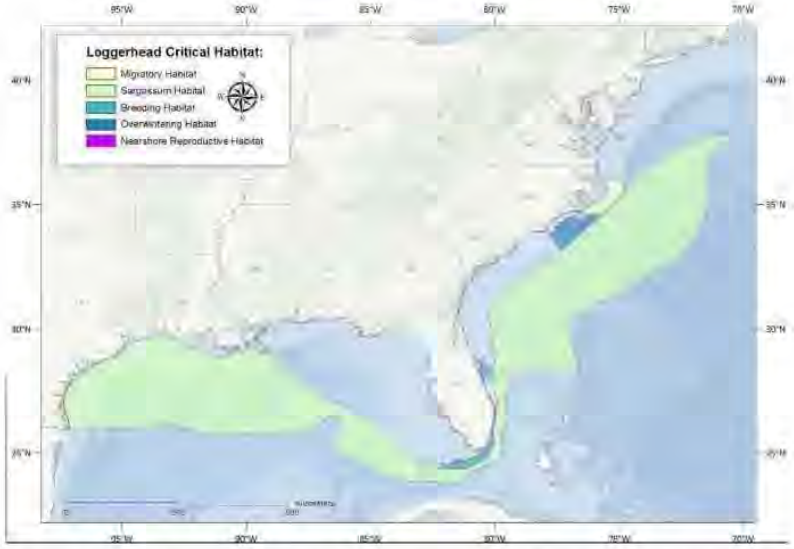


Figure 3. Northwest Atlantic DPS Loggerhead Sea Turtle Designated Critical Habitat

NMFS describes the essential physical and biological feature (PBF) of loggerhead breeding habitat as sites that support meaningful aggregations of both male and female adult individuals during the breeding season (NMFS 2013). The towing of a single ship through breeding critical habitat would either result in no effect to this PBF, if towing did not coincide with loggerhead breeding season, or a very minor short-term effect. Although the transit route may go through nearshore reproductive habitat and may present temporary obstructions, any potential effects to essential habitat features are expected to be temporary and localized with no lasting effects over extended periods. Therefore, any effects of vessel activity on loggerhead breeding critical habitat as part of the proposed action are likely to be insignificant.

Sargassum habitat occurs in both the neritic and oceanic environment. NMFS describes the PBF of loggerhead *Sargassum* habitat as developmental and foraging habitat for young loggerheads where surface waters form accumulations of floating material, especially *Sargassum* (NMFS 2013). The ex-Enterprise ship tow route could also potentially overlap with loggerhead *Sargassum* designated critical habitat in the Gulf of Mexico and off Florida. We anticipate that vessel operators would actively avoid *Sargassum* patches within the action area, as coming near or in contact with *Sargassum* may have detrimental impacts on vessel operation (e.g. slow or jam propellers or tow lines, or clog engine cooling water intakes). It is possible, though, that the tug, tow cable, and towed ship may still come in direct contact with *Sargassum,* temporarily disturbing the biotic community (including available prey for juvenile loggerheads) and other

materials associated with this habitat. However, such disturbances are likely to be very short in duration, cover a relatively small area, and result in no lasting detrimental effect on the affected *Sargassum* community. Any effects of vessel activity on loggerhead *Sargassum* designated critical habitat as part of the proposed action are likely to be insignificant. Therefore, we determine that vessel operation as part of the proposed action may affect but are not likely to adversely affect Northwest Atlantic Ocean DPS of loggerhead designated critical habitat.

Ship Sound and Behavioral Disturbance Effects Analysis

Sound from contracted tug ships and towed Navy ships may be detectable to ESA-listed species along the tow route. While the density of ESA-listed species in the open ocean is so low that they are unlikely to be encountered during this single towing event, nearshore species are more likely to be encountered in transit in the estuaries where origination and destination ports occur. However, these areas are already heavily trafficked by ships and the additional noise from the towed ex-Enterprise is not expected to substantially increase noise levels above background or ambient conditions. Any response elicited from ESA-listed species due to ship noise is expected to be in the form of behavioral avoidance or interruption in behavior. We believe any behavioral response of ESA-listed species to ship noise will be of limited duration and magnitude. The temporary disturbance of ESA-listed species associated with the potential ship interactions as part of the proposed action is not expected to result in injury or reduced fitness, as we do not anticipate any significant disruption of breeding, feeding, or sheltering to occur. Therefore, any potential effects to ESA-listed species from ship sound or ship avoidance behavior resulting from the proposed action would be undetectable, not measurable, or so minor that they cannot be meaningfully evaluated, and thus would be insignificant.

Ship Breaking/Dismantling Activities Effects Analysis

For this consultation, ship breaking (or dismantling) is considered a consequence caused by the Navy's proposed action since the Navy transfers custody of the ship to the dismantlement contractor upon arrival at its facility. Ship breaking could occur in any of the three proposed destination ports: Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama. In this subsection, we evaluate the effects of ship breaking on the ESA-listed species, including water and sediment quality degradation related stressors and sound-related stressors associated with the shipbreaking process.

If not contained and disposed of properly during the shipbreaking process, hazardous materials (e.g., PCBs, petroleum products, asbestos) commonly found in ships have the potential to affect ESA-listed species and designated critical habitats. Ship dismantling companies that are awarded contracts to tow and dismantle inactive ships are responsible for all work associated with the removal and proper disposal of hazardous materials (Navy 2022). Contractors must comply with all applicable federal, state, and local environmental laws and regulations during the processing, use, or disposal of any material under an awarded contract. Shipbreaking companies must submit

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an Environmental Compliance Plan as part of the bid process (Navy 2022). Bidders must demonstrate how the shipbreaking facility will ensure safe and environmentally sound management of all hazardous materials and wastes removed from a ship recycled at the facility, including information for asbestos, PCBs, fuels and oils, bilge/ballast water, heavy metals, paints and coatings, waste water/sludge, ozone depleting substances and other potential hazardous materials (Navy 2022). In addition, bidders must certify and/or verify that the dismantling facility has developed, implemented, and maintains a Spill Prevention, Control and Countermeasures Plan and a Stormwater Pollution Prevention Plan. The bidder must also reveal any Notices of Violations, fines or proposed fines, convictions or citations associated with environmental compliance, and whether the bidder has been the subject of any judicial or administrative proceeding related to the violation of any applicable law related to environmental compliance (Navy 2022).

While ESA-listed sea turtles could occur in any of the three proposed ex-Enterprise towing destination ports, we anticipate that the number of turtles in the immediate vicinity of where shipbreaking would occur at these ports to be low, further reducing the likelihood of exposure to this activity. ESA-listed Atlantic and shortnose sturgeon in the Hampton Roads port area and Gulf sturgeon in the Mobile port area could also potentially be exposed to stressors resulting from shipbreaking activities. However, similar to turtles, we anticipate that the number of sturgeon in the immediate vicinity of where shipbreaking would occur at these ports to be low. Based on the requirements for environmental compliance related to the shipbreaking process described above, and the low anticipated density of ESA-listed species in the immediate vicinity of this activity, we have determined that the potential effects to ESA-listed species associated with exposure to contaminant or hazardous material discharged from the shipbreaking process is extremely unlikely to occur, and thus would be discountable.

Noise from shipbreaking activities would likely be detectable to ESA-listed sea turtles and sturgeon if they were in close proximity to the ship breaking facility. However, we expect ESA-listed species to be rare in the industrialized portions of ports where shipbreaking facilities are located due to the number of ships, amount of noise, and possible reduced water quality from the general industrialization of the immediate area and development of surrounding areas. Further, it is unlikely that shipbreaking activities associated with the proposed action would significantly increase underwater noise levels above the baseline level at these high traffic, industrialized ports. Therefore, we determine that the potential for effects to ESA-listed species and critical habitat associated with underwater noise from shipbreaking activities is extremely unlikely to occur, and thus would be discountable.

In-Water Hull Cleaning Effects Analysis

In this subsection, we evaluate the effects to ESA-listed species and critical habitat from in-water hull cleaning of the ex-Enterprise at its origination ports in Newport News, Virginia. As

discussed in the Proposed Action above, if the selected destination port is Brownsville or Mobile, the Navy will clean the hull of the ex-Enterprise prior to towing as a mitigation measure to reduce the potential risk of invasive species introductions along the tow route or at the destination port. In scenarios where hull cleaning mitigation is required, the Navy would give first consideration to one of the dry dock methods for cleaning the hull of the ex-Enterprise (Navy 2018d). Dry-dock hull cleaning would have no effect on the ESA-listed species or critical habitats in the action area. In scenarios where dry dock hull cleaning is not feasible, the Navy would conduct in-water hull cleaning of the ex-Enterprise at the current mooring location in Newport News, Virginia. As a mitigation measure to reduce potential effects of in-water hull cleaning to adult Atlantic sturgeon (present during spawning migrations and summer foraging) and sea turtles (seasonally present in Chesapeake Bay), the Navy would, to the maximum extent practicable, schedule any in-water hull cleaning of the ex-Enterprise during months when these ESA-listed species are less abundant in the Newport News port vicinity (i.e., November 1 through February 28).

While the Navy's proposed mitigation prioritizes dry dock hull cleaning over in-water hull cleaning, and in-water cleaning during a specified seasonal work window over in-water cleaning outside of that window, these measures are contingent on the feasible (or practicality) of the situation, which can be affected by numerous factors. Since there is no guarantee that either of these measures would be implemented, for our effects analysis we must assume the worst-case ex-Enterprise hull cleaning scenario: in-water hull cleaning conducted anytime from March through October. We start with an evaluation of the potential effects of water and sediment quality degradation related stressors associated with in-water hull cleaning. We then address the potential effects of sound-related stressors associated with in-water hull cleaning.

Potential Environmental Effects from In-water Hull Cleaning

In-water hull cleaning involves the active removal of biofouling organisms and varying amounts of antifouling paint, which can increase localized environmental loading of copper, and possibly other metals such as zinc or lead (Forbes 1996; NUWC 2017). Copper is toxic to aquatic organisms (mainly dissolved copper due to its bioavailability), which makes it a good biocide, but its use as an antifouling agent can cause unintended consequences when paint containing copper is discharged as particulates into the water column (USDOT 2012). The main environmental concerns regarding contamination from copper-based antifoulants include: (1) bioaccumulation, (2) ecotoxicological effects and subsequent changes to local ecology and biodiversity, and (3) effects on ecosystem function (i.e. microbial and geochemical processes that regulate the cycling, bioavailability, and fate of micro- and macronutrients) (Macleod and Eriksen 2009). Marine organisms vary in their relative accumulation and tolerance of trace metals, due in part to differences in uptake pathways and metals changing bioavailability and speciation (Clement et al. 2010). Prolonged exposure to high concentrations of copper can impact fish in various ways, ranging from impacting sensory organs to causing mortality (Woody

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2007). Common sub-lethal effects of copper and zinc in marine organisms include inhibited growth and settlement of larvae, interference with respiration, metabolism, reproduction and/or abnormal behaviors (Clement et al. 2010). Benthic community dynamics (e.g. species composition, abundance and diversity) and functions (e.g. microbial mineralization processes) are known to be highly dependent on the physical, geological, chemical and biological conditions of the local environment (Clement et al. 2010). When metal concentrations in sediments reach extremely high levels, benthic assemblages can be adversely affected to the point that the regular functioning of such communities is comprised (Macleod and Eriksen 2009).

There are several pathways by which metals in antifoulants can become environmentally available: (1) dissolution from the active paint surface, (2) ablation or physical damage of the painted surface, and (3) release from accumulated paint in the sediments (Macleod and Eriksen 2009). Water toxicity associated with heavy metal loading is mediated by the biological, physicochemical and hydrographic conditions of the surrounding environment. Once released from a coating, dissolved copper may take a number of chemical forms in natural seawater environments, including the hydrated free copper ion (Cu2+), dissolved organic copper (labile and inert), inorganic copper complexes, and colloidal and particulate copper (Morel 1983). In general, only the free copper ion represents the bioavailable fraction of copper in the marine environment (Morel 1983). Biofilms such as organic copper-binding ligands in coastal estuaries have been shown to effectively buffer copper toxicity even at relatively high copper loadings (Buck and Bruland 2005; Rivera-Duarte et al. 2005). Hydrographic conditions, such as currents, wind turbulence, tidal exchange, and naturally occurring organic matter, can also play a role in diminishing toxicity from antifouling paint in bays or bodies of water with more open geography. Copper concentrations that exceed the binding capacity of natural ligands can lead to potentially toxic copper conditions (Rivera-Duarte et al. 2005), which can be an issue in harbors and marinas, where there are large concentrations of active ships and where water circulation may be limited.

While in-water hull cleaning may actively release copper, zinc and other metal particles over a short time frame, continuous passive leaching from ship hull paint is the primary contributor to ambient toxicity (NUWC 2017). For example, Valkirs et al. (1994) found that 99% of the dissolved copper loading in San Diego Bay was contributed by antifouling paints on pleasure craft (65%) and active Naval ships (34%), compared to less than one percent contributed from biofouling removal. The "life span" of antifouling paints is highly variable based on the thickness and type of paint on the hull. Any cuprous-oxide bearing antifouling coating that remains on an inactive ship can release some copper into seawater, but the levels of copper released decrease over time (i.e., with a concurrent decrease in efficacy at preventing marine fouling). While the effective life span of the hull coating's anti-fouling ability is about thirteen years, the active ingredients in the hull coating will continue to degrade over time to the point at which no active ingredients remain. Valkirs et al. (1994) found that low copper release rates

from anti-fouling paint was likely the result of the age of the paints. This was consistent with the hulls being heavily fouled, as the copper release rate was not high enough to prevent biofouling. Thus, the older the antifouling paint is the less of the active ingredient will be present to potentially enter the water column during hull cleaning.

In addition to heavy metals, the active removal of biofouling organisms from a ship releases organic matter to the immediate aquatic environment. Water bodies can be adversely impacted by elevated concentrations of organic matter. The decay of excess organic matter could result in increases of nutrients, primary productivity (e.g. plankton blooms), and associated decreases in DO, which can lead to hypoxic or anoxic conditions. Hypoxia is a condition where the amount of DO in the water is not adequate for aerobic organisms, while anoxia is a complete lack of DO. Any biofouling (e.g., algal growth, shellfish) removed from the ship during in-water hull cleaning would be expected to settle quickly to the seafloor. Some biofouling organisms would be expected to survive and reattach to bottom substrates, whereas some may not survive and undergo biochemical decomposition that could potentially drive increases in nutrients and decreases in DO (Valkirs et al. 1994). A portion of the released organic material is also consumed by other organisms, thus buffering the effect of organic material release. In addition, similar to metal loadings, the effect from organic matter loading is diminished by hydrographic conditions. Currents, tidal effects, and wind-induced water turbulence add oxygen to the water, buffering the impacts from organic matter loading. In-water hull cleaning can also increase turbidity and decrease water clarity, although we would anticipate these effects to be temporary and localized.

Naval Ocean Systems Center (1981) evaluated water column copper concentrations near in-water hull cleaning operations in San Diego Bay. They found that during hull cleaning operations, water column copper concentrations rapidly decreased with distance from the ship, reaching ambient levels within 50 m to 100 m of the ship. Residence time of the dissolved copper near the cleaning operation was short; ambient levels were reached within one to three hours, dependent on the tidal cycle. This study also found that much of the copper released during the hull cleaning operation was in particulate form, and quickly incorporated into bottom sediments. Slight increases in dissolved and particulate concentrations of lead and zinc were found in the immediate vicinity of the hull cleaning operations, but the concentrations were not considered environmentally significant (Naval Ocean Systems Center 1981). BOD, a measure of the degree of pollution, is the amount of DO that must be present in water in order for microorganisms to decompose the organic matter in the water. BOD increased slightly in some samples taken in the vicinity of in-water hull cleaning operations, but decreased rapidly to ambient concentrations both with distance from the cleaning and after cessation of the cleaning activity (Naval Ocean Systems Center 1981).

The decommissioned ship ex-Independence had been moored in Bremerton (Puget Sound, Washington) from September 1998, until March 2017, when its hull was cleaned in preparation for towing to Brownsville, Texas. The ship's hull was last painted in December 1986. Water

quality monitoring was conducted over four sampling events, which included before removal (Event 1, Baseline, November 9 to 10, 2016), during removal (Event 2, During-removal, January 10, 2017), at the end of removal (Event 3, Week-post-removal, January 31, 2017), and 40 days after removal was completed (Event 4, Month-post-removal, March 7, 2017). Water samples were analyzed for dissolved and total copper and zinc, nutrients, DOC, BOD, and turbidity. In addition, in-situ sensors were utilized during the study to provide continuous monitoring of temperature, salinity, pH, DO, and turbidity within the water column at each sampling site. In summary, there was no evidence of any parameter exceeding regulatory thresholds and no evidence of persistent water quality impacts from the ex-Independence biofouling removal operation (NUWC 2017). The water quality report on the effects of cleaning the hull found statistically significant increases of total and dissolved copper, turbidity and nitrate. No negative impacts to water quality were found from total and dissolved zinc, DO, nitrite, ammonia, DOC or BOD (NUWC 2017). All parameters returned to baseline levels and were similar to reference conditions within 40 days after biofouling removal was completed (NUWC 2017). Dissolved copper and zinc, DO, and turbidity did not exceed the Environmental Protection Agency water quality standards for aquatic life and were less than or equal to 25% of the threshold range for exceedance. As noted above, since the antifouling paint of this ship's hull was over 30 years old, much of the copper and other metal contaminants had likely already leached out into the port prior to the in-water hull cleaning operation. Inactive Navy ships that have been painted more recently may have higher copper release rates as a result of in-water hull cleaning than those found for the ex-Independence.

Since the ex-Enterprise was last painted only about 6 years ago, we would expect the amount of biofouling on the hull (which could affect DO when released into the water column) to be less as compared to the ex-Independence which had not been painted in over 30 years. It should be noted that hull cleaning of the ex-Independence occurred in Puget Sound in the middle of winter, a time of year when the effects on DO would be less of a concern. The effects on DO from in-water hull cleaning in the proposed origination port of Newport News, Virginia would be of greater concern if conducted in the summer months. Effects on DO could be further exacerbated if in-water hull cleaning co-occurs with algal blooms at the origination ports. However, even if this were to happen, we would still anticipate that the change in DO would be isolated to the small area within the vicinity of the ex-Enterprise, and that DO would return to baseline shortly after hull cleaning was completed. Sturgeon in the affected area could easily move to nearby areas with more favorable conditions, and, therefore, are not likely to be adversely affected by changes in DO levels. The effects of in-water hull cleaning in the Newport News area would likely be further minimized if the Navy conducts this activity during colder months of the year, when water quality impacts may be lower and ESA-listed species are less abundant.

In-water hull cleaning of inactive Navy ships can also result in bottom sediment contamination from copper or zinc found in paint particles dislodged from the hull during cleaning. Sediment monitoring was conducted in Sinclair Inlet, Puget Sound to assess potential impacts to sediment

quality from in-water hull cleaning of the Navy ex-Independence (Johnston et al. 2018). Sediment chemistry sampling was performed at six locations within the zone of influence near the ship prior to the start of cleaning operations (pre-removal) and another sampling event conducted approximately one month after the ship was moved from Sinclair Inlet and about two months after biofouling removal was completed (post-removal). Data from the 0 to 10 cm grab samples taken before and after the project showed that there were no statistically significant (at the $p \leq 0.05$ level) differences in concentrations of total copper and zinc, grain size, and TOC at the site after biofouling removal was completed compared to before removal (Johnston et al. 2018). However, the lack of statistical significance between the two sampling periods was due to the high variability for both sampling periods, and post-removal sediment zinc concentrations were statistically different (about twice as high) from pre-removal concentrations at the $p \leq 0.10$ level (Johnston et al. 2018). While concentrations of total copper did not exceed the Washington State Sediment Management Standards Maximum Chemical Criteria (MCC) of 390 micrograms per gram dry weight in any of the pre-removal 0 to 10 cm grabs, three (50%) of the post-removal 0 to 10 cm grabs exceeded this benchmark. These results suggest copper and zinc from the ship's hull were deposited in the sediment below as a result of in-water hull cleaning. However, since high levels of copper were also found in post-removal sediment core samples (i.e., 17% of samples exceeded the MCC benchmark), disturbance of the seafloor during hull cleaning may have also contributed to the higher copper levels found in some of the 0 to 10 cm post-removal grabs (Johnston et al. 2018).

Metal bioavailability and the potential for metal exposure to cause adverse effects to benthic organisms were evaluated by collecting sediment cores from the site and conducting Acid Volatile Sulfide and Simultaneously Extracted Metals measurements of core sections in the top 0 to 25 cm (0 to 10 in) of sediment located under the former location of ship's hull. The findings from this study showed that the potential impact of biofouling removal performed on the ex-Independence to the benthic community from the release of copper and zinc was low and that the benthic community in the area of the vessel was not adversely degraded (Johnston et al. 2018). However, as noted in the report, there is uncertainty about this finding due to the variability and interferences associated with the method, including analytical inaccuracy, seasonal variation of Acid Volatile Sulfide, sample inhomogeneity, and other sources of variation.

Another potential effect on water and sediment quality from in-water hull cleaning is the resuspension of contaminants (e.g., PCBs and mercury) in bottom sediments where inactive Navy ships are docked. Resuspension could possibly occur from disturbance of the seafloor caused by hull cleaning divers or from the large volume and weight of organic materials scrapped from the ship's hull when it falls to the seafloor. In soft bottom ports, material falling from the ship would not necessarily remain on the surface but would "splash" on the bottom sinking into the muck and disturbing the bottom conditions (Johnston et al. 2018). However, we have no information to determine whether sediment resuspension occurs during in-water hull

cleaning, or (if it occurs) whether it would have more than a minor, short-term effect on water and sediment quality within the origination port of Newport News, Virginia.

Effects of In-Water Hull Cleaning on ESA-listed Species

The information presented above suggests potential impacts from in-water hull cleaning would be highly localized. Therefore, the only ESA-listed species that could potentially be exposed to decreased water or sediment quality would be those occurring in the immediate vicinity of where in-water hull cleaning would take place in the port of Newport News, Virginia. All five of the ESA-listed sea turtle species in the action area have been reported in Virginia waters of the Chesapeake Bay. The majority of sea turtles that enter the Chesapeake Bay in late spring are either juvenile loggerheads or Kemp's Ridley's. While green and leatherback sea turtles are less common, both species are seasonally present during warmer months in the lower Chesapeake Bay, including the Newport News area. The hawksbill is the least common sea turtle in Chesapeake Bay, with only two strandings reported in Virginia, both of which were considered "strays" from the more tropical waters they normally inhabit (VIMS 2023). We find it extremely unlikely that hawksbill turtles would occur in the Newport News port area within the short time frame during which in-water hull cleaning may occur. As such, any effects from in-water hull cleaning of the ex-Enterprise to hawksbill sea turtles are discountable.

The two fish species that may be exposed to stressors resulting from in-water hull cleaning in Newport News are Atlantic sturgeon and shortnose sturgeon. Atlantic sturgeon from the Chesapeake Bay DPS have a much higher probability of exposure to the effects of in-water hull cleaning in Newport News as compared to other DPSs, particularly during certain times of year (e.g., adult spawning migrations). Given the migratory and foraging behaviors of Atlantic sturgeon, individuals from the other four ESA-listed DPSs could also occur in the Newport News port vicinity and, therefore, potentially be exposed to the effects of in-water hull cleaning. While shortnose sturgeon are found within Chesapeake Bay, they are primarily distributed within the Upper Bay (Welsh et al. 2002). Based on fishery dependent data collected during a reward program to determine the distribution of shortnose sturgeon in the Chesapeake Bay, Welsh et al. (2002) found that the large majority of captures occurred north of the Chesapeake Bay bridge. Out of 40 captures, one shortnose sturgeon was captured at the mouth of the Rappahannock River, Virginia but none were captured south of this location. In March 2016, Balazik (2017) reported capture of a 75 cm (likely mature) shortnose sturgeon in the freshwater portion of the James River (river kilometer 48). While the occurrence of shortnose sturgeon has been documented in the James River, given the species' rarity in the lower bay, we find it extremely unlikely that a shortnose sturgeon would occur in the Newport News port area within the short time frame during which in-water hull cleaning may occur. As such, any effects from in-water hull cleaning of the ex-Enterprise to shortnose sturgeon are discountable.

Although in-water hull cleaning can affect levels of DO, turbidity, nitrate, organic debris and dissolved metals in the water column, monitoring studies have shown these conditions to be very temporary, decreasing rapidly to ambient concentrations after cessation of the cleaning activity.

With a large Navy ship such as the ex-Enterprise, in-water cleaning would likely be conducted over a relatively long period (i.e., weeks to months) such that biofouling material would be released slowly over time, allowing it to disperse within the environment. Due to the age of the antifouling paint on many inactive ships, a large percentage of the copper applied to inactive ships' hulls has likely already been released into the environment over the long period of time since most inactive ships have been painted (e.g., Valkirs et al. 1994). Since the ex-Enterprise was last painted only about 6 years ago (April 2017), we would expect that the antifouling hull paint still contains relatively high levels of copper. However, given the recent hull painting, we would also expect less biofouling of the hull as compared to ships that had not been painted in decades. With less biofouling material to clean, it is likely that less scraping of the hull would be needed, which could result is less paint removed from the hull.

As discussed above, as a mitigation measure the Navy would, to the maximum extent practicable, schedule any in-water hull cleaning of the ex-Enterprise from November 1 through February 28. In addition to benefits of lower densities of ESA-listed species that could potentially be exposed during these months, the effects on water quality, including DO, turbidity, and the possibility of synergistic effects with co-occurring algal blooms, would also likely be minimized if in-water hull cleaning were conducted during colder, winter months. Sturgeon and sea turtles, in general, would be expected to avoid areas where in-water hull cleaning is being conducted due to the noise, debris and general disturbance such activities produce. Given the extremely small area where in-water hull cleaning would be conducted in relation to the total available habitat within origination ports, any effects of avoiding these areas during active hull cleaning would be undetectable, not measurable, or so minor that they cannot be meaningfully evaluated, and thus would be insignificant.

Given the relatively short time duration of this stressor, small area affected, expected low densities of ESA-listed species in the affected areas, and mitigation to prioritize in-water hull cleaning of the ex-Enterprise during winter months, we find direct exposure of Atlantic sturgeon or sea turtles to the effects of water quality degradation is extremely unlikely to occur, and thus would be discountable. As discussed above, while some ESA-listed sturgeon and sea turtles would be expected to avoid areas where in-water hull cleaning in actively being conducted, any effects associated with avoidance of these areas would be undetectable, not measurable, or so minor that they cannot be meaningfully evaluated, and thus would be insignificant.

ESA-listed species that feed in the water column could be exposed to contaminants indirectly through bioaccumulation up the food chain. However, given the highly localized nature of this stressor, any indirect effects would be undetectable, not measurable, or so minor that they cannot be meaningfully evaluated, and thus would be insignificant. As discussed above, resuspension of contaminated sediments could represent another potential stressor caused by in-water hull cleaning. However, at present we have no information to determine whether sediment resuspension would occur during in-water hull cleaning, nor to evaluate the magnitude of the impact this stressor may have on ESA-listed species, if it does occur.

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A potentially longer term (but still highly localized) stressor from in-water hull cleaning is from copper and possibly other metals (i.e., zinc or lead) that settle onto the seafloor and mix with the benthic environment. Solid phase exposure can occur when metals become available to benthic fauna through ingestion and filtering of contaminated organic matter and any associated sediments (Clement et al. 2010). Metals can accumulate over time in sediments, particularly organically enriched sediments which have a higher capacity to bind and accumulate copper (Macleod and Eriksen 2009). If benthic fish normally feed in the port areas where in-water hull cleaning would occur, the risk of exposure to contaminated sediments can last for years or decades, as copper is highly conservative once introduced into bottom sediments (Petersen et al. 1997; Ranke 2002). The only way to reduce sediment copper levels in a local area is by dispersal or removal in the form of either biological bioturbation or hydrological resuspension (Smith and Williamson 1986). Macleod and Eriksen (2009) analyzed the ecological impacts of copper-based antifoulants used in the salmon farming industry in Tasmania. They found no major acute effects of antifoulant release in the water-column. Instead, they concluded that the greatest risk appears to be the potential for build-up of copper and zinc in the sediments around the farms.

During, and for some period after, in-water hull cleaning benthic fish species may be attracted to hull fouling prey organisms that have been removed from the hull and settled onto the seafloor. Shells and other calcareous material scrapped from the hull also provide attachment substrate for organisms to colonize. In-water hull cleaning of the ex-Independence in Puget Sound resulted in increased structure and diversity of the benthic community, the effects of which lasted for at least two months after hull cleaning was completed (Johnston et al. 2018). Benthic associated species, such as sturgeon, that occupy port areas where in-water hull cleaning may occur are more likely to be exposed to elevated levels of sediments contaminated with copper and other metals as a result of hull cleaning.

Exposure to contaminated sediments could contribute to the bioaccumulation of heavy metals in sturgeon located in origination port environments. Heavy metals and organochlorine compounds accumulate in sturgeon tissue, but their long-term effects are not known (Ruelle and Keenlyne 1993). Life histories of sturgeon species (i.e., long lifespan, extended residence in estuarine habitats, benthic foraging) predispose them to long-term, repeated exposure to environmental contamination and potential bioaccumulation of heavy metals and other toxicants (Dadswell 1979). Sublethal effects may include impacts to sensory organs or reproductive impairments, although there has been little work on the effects of contaminants on sturgeon to date. High levels of contaminants in several other fish species are associated with reproductive impairment (Billsson 1998; Cameron et al. 1992; Giesy et al. 1986; Hammerschmidt et al. 2002), reduced survival of larval fish (McCauley et al. 2015; Willford et al. 1981), delayed maturity and posterior malformations (Billsson 1998).

As discussed above, sediment monitoring conducted to assess potential impacts to sediment quality from in-water hull cleaning of the Navy ex-Independence found no statistically significantly ($p \leq 0.05$) differences in concentrations of total copper or zinc between pre-removal

and post-removal samples, and that the potential impact on the benthic community from metal exposure associated with biofouling removal was low (Johnston et al. 2018). As noted by the authors, the non-significant results may have been due to small sample sizes and high variability in the monitoring data. Metal contaminant levels in post-removal samples were generally higher compared to pre-removal samples, and copper levels exceeded the state of Washington MCC benchmark for one-half of the post-removal samples taken. Since copper and zinc from antifouling paint particles can accumulate and persist in sediments over time, we expect the likelihood of exposure to contaminated sediments at a particular origination port would be influenced by the relative frequency of in-water hull cleanings conducted at each port. As the total load of copper and zinc within the sediment increases, so does the likelihood of exposure through ingestion of sediment or benthic prey. The accumulation of copper and zinc in sediments over time also increase the likelihood of exposure to contaminant levels that could result in adverse effects on benthic feeding fish. However, whereas our 2019 programmatic biological opinion evaluated the cumulative risk from multiple in-water hull cleanings at a particular origination port, for this consultation we are evaluating the risk from in-water hull of a single vessel. Newport News was not included as an origination port in the proposed action for the programmatic consultation, and the Navy has not indicated that they would conduct in-water hull cleanings of other inactive vessels (i.e., besides the ex-Enterprise) at this port in the future. The cumulative risk from in-water hull cleaning multiple ships at a given port over the course of the Navy's inactive ship towing program was a factor for our programmatic evaluation. However, the risk of an Atlantic sturgeon exposure to contaminated sediment at levels that would result in adverse effects from in-water hull cleaning of a single inactive ship is considerably lower. In addition, as part of the James River Navigation Project, we expect the Newport News port area would be dredged at regular intervals to maintain navigation channels (USACE 2023). Thus, it is possible that contaminated sediment resulting from in water hull cleaning could be removed through maintenance dredging activities.

Based on the anticipated low risk from a single in-water hull cleaning, in combination with the anticipated small amount of time sturgeon would likely spend foraging in the busy, industrialized Newport News port area where in-water hull cleaning would occur, and the relatively low densities of Atlantic sturgeon in this portion of this James River, we find the exposure of Atlantic sturgeon to copper or other metals in bottom sediments resulting from in-water hull cleaning of the ex-Enterprise is extremely unlikely to occur, and thus would be discountable.

In-water hull cleaning would also introduce noise into the aquatic environment. We do not have specific information on sound levels emitted from underwater hull cleaning equipment. However, given that the origination port of Newport News is an industrialized area with heavy ship traffic and other anthropogenic sounds sources, ambient noise levels are expected to be relatively high in general. In addition, because the equipment would be operated by divers underwater (i.e., operated at sound levels within Occupational Safety and Health Administration Permissible Exposure Limits that would not harm human hearing), we would not expect that

sound levels would be high enough to adversely affect any ESA-listed sturgeon or sea turtle species that could occur sporadically in proximity to the ship cleaning operation. Therefore, we find that the potential effects of exposure to noise from in-water hull cleaning would be undetectable, not measurable, or so minor that they cannot be meaningfully evaluated, and thus would be insignificant.

Effects of In-Water Hull Cleaning on Critical Habitat

Critical habitat for the Chesapeake Bay DPS of Atlantic sturgeon occurs within the James River, including the portion of the river where in-water hull cleaning of the ex-Enterprise may occur. The specific critical habitat unit that may be affected by the proposed action is Chesapeake Bay Unit 5 James River (NMFS 2017). The James River unit include the river sections from Boshers Dam downstream for 160 river kms to where the main stem river discharges at its mouth into the Chesapeake Bay at Hampton Roads (Figure 4)**Error! Reference source not found.**. For our critical habitat effects analysis we evaluate the effects of in-water hull cleaning on the essential PBFs of designated critical habitat for the Chesapeake Bay DPS of Atlantic sturgeon. PBFs determined to be essential for Atlantic sturgeon reproduction and recruitment include (1) suitable hard bottom substrate in low salinity waters for settlement of fertilized eggs, refuge, growth, and development of early life stages, (2) transitional salinity zones for juvenile foraging and physiological development, (3) water of appropriate depth and absent physical barriers to passage, (4) unimpeded movement of adults to and from spawning sites, and (5) water quality conditions that support spawning, survival, growth, development, and recruitment. In-water hull cleaning activities in the port Newport News would have no effect on the first four of these PBFs.

Water quality impacts of in-water hull cleaning could affect the Atlantic sturgeon essential PBF related to oxygen levels. Sturgeon are more sensitive to low level DO conditions than other fishes, possessing limited behavioral and physiological capacity to respond to hypoxia. In experiments on Atlantic sturgeon, the effect of oxygen level on routine metabolism, consumption, feeding metabolism, growth, and survival has been shown to be conditional on temperature (Secor and Niklitschek 2001). To avoid lethal and sublethal effects, sturgeon must avoid temperatures above 33.7 degrees Celsius with complete oxygen saturation (Ziegeweid et al. 2008) or hypoxic conditions, particularly as water exceeds about 15 degrees Celsius (Secor and Gunderson 1998). Increased nutrients released from the hull of the ex-Enterprise during hull cleaning could result in algal blooms and subsequent die-offs, which may lead to decreased levels of DO. However, based on the post-hull cleaning water quality reports discussed above, we would expect increased nutrient loading to be a short-term effect with levels returning to baseline within a few hours from cleaning. If DO levels were impacted, the impact would likely be short-term, and limited to a small area below and immediately adjacent to the ship. Sturgeon in the area would be expected to swim to an unaffected area to avoid stress. In addition, if in-water hull cleaning of the ex-Enterprise is conducted during the preferred time frame (i.e., November through February), any adverse effects on sturgeon related to DO levels would likely

be further minimized. Based on the factors above, we find that any effects on designated critical habitat of the Chesapeake Bay DPS of Atlantic sturgeon from in-water hull cleaning would be either not measurable or so minor that they cannot be meaningfully evaluated, and thus would be insignificant.

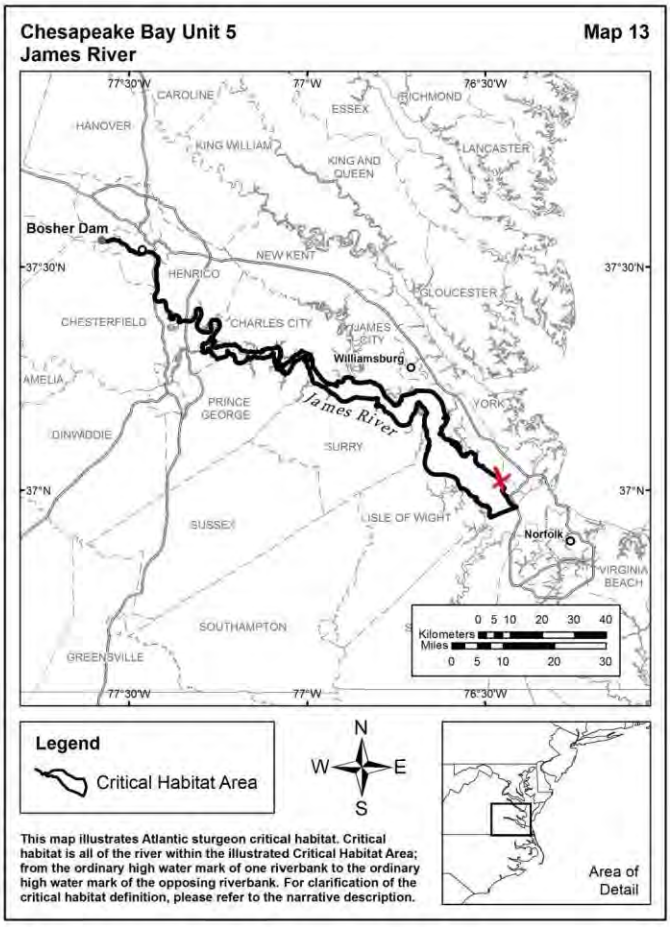


Figure 4. James River Unit of Critical Habitat for the Chesapeake Bay DPS of Atlantic Sturgeon, Including Areas of Overlap with the Propose Action Area. Approximate location of the origination port of Newport News denoted by X. (NMFS 2017)

Introduction of Nonindigenous Species Effects Analysis

Nonindigenous aquatic species (NAS) are defined as species that enter a body of water or aquatic ecosystem outside of their historic or native range (USGS 2018). The successful establishment and spread of a NAS in a new environment depends upon multiple factors, including climate, food resources, its reproductive strategy, competition, predation, and parasitism (Carlton 1996). NAS are introduced by ships through ballast water exchange and hull fouling.

When non-native plants and animals are introduced into habitats where they do not naturally occur, they can have significant impacts on ecosystems and native fauna and flora. The effects that NAS can have on the existing community of native species in the areas where they become established range from adverse to no effect to beneficial effects (Schlaepfer et al. 2011). Non-native species can reduce native species abundance and distribution, and reduce local biodiversity by out-competing native species for food and habitat. They may also displace food items preferred by native predators, disrupting the natural food web.

Below we assess the risk of a NAS introduction via ballast water exchange and hull fouling for two of the ex-Enterprise ship tow routes proposed by the Navy: Newport News to Mobile, Alabama and Newport News to Brownsville, Texas. The third possible tow route proposed by the Navy is from Newport News to a commercial shipyard facility in the Hampton Roads Metropolitan Area. Although biofouling organisms are more likely to survive trips with shorter tow durations, origination and destination ports that are very close to one another, and that have nearly identical salinities, would be expected to have the same (or nearly identical) species (both native and nonnative) compositions. Given the very close proximity of Newport News to another commercial shipyard facility in the Hampton Roads Metropolitan Area, we would expect the species compositions to be identical (or nearly so), such that the risk of a new NAS (i.e., one that is not already present at the destination port in the Hampton Roads Metropolitan Area) becoming established is likely extremely small. Therefore, we find it extremely unlikely (to the point of being discountable) that a NAS would be introduced from towing the ex-Enterprise to a destination port in the Hampton Roads Metropolitan Area for dismantling.

NAS Introduction via Ballast Water

Ballast water is required for towing inactive ships for list, trim, and stability purposes (Navy 2018a). When inactive ships are towed for transfer purposes to ports consisting of inactive fleet sites, ballast water will not be removed when the ship arrives at the destination port. Prior to towing the ship in the future, ballast water may be added, transferred between tanks, or removed. If any ballast water is removed, it will be sent offsite for treatment and disposal in accordance with all federal, state, and local laws and regulations (Navy 2018a). For inactive ships being towed for dismantlement, ballast water will be removed as part of the dismantlement process and is under the cognizance of the Navy contractor. As part of the dismantling process, the contractor will pump the ballast water ashore and send it for treatment and disposal in accordance with all federal, state, and local laws and regulations (Navy 2018a). The privately owned and operated

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tugboat will operate under all U.S. Coast Guard laws and regulations, thus reducing the risk of introducing a NAS through ballast water contained in the tugboat. Therefore, we find it extremely unlikely (to the point of being discountable) that a NAS would be introduced via ballast water as part of the proposed action.

NAS Introduced Via Hull Fouling

Hull fouling (or biofouling) involves the attachment of generally bottom-associated sessile and sedentary organisms to a ship's surface in contact with water over time. In general, inactive naval ship are particularly susceptible to hull biofouling given their large hull and niche surface areas, long lay-up times, general lack of hull maintenance, and slow tow speeds. These ships tend to have dense and extensive biofouling assemblages in both hull and non-hull areas that greatly exceed fouling levels of most operational military and commercial ships (Davidson et al. 2008). All submerged areas of the hull, including appendages and niche areas are subject to the accumulation of biofouling (McClay et al. 2015). Niche areas are problematic because they are difficult to access and clean. Most hull cleaning systems are designed to clean open, flat or broadly curved hull plates, rather than the partially closed or shielded niche areas (McClay et al. 2015). Cleaning the smooth sides and bottom of a hull through the process of physical scrubbing, heating or water jet blasting is a straightforward process, but niche areas that are not reachable by area cleaning machines require individual human attention and specialized tools (McClay et al. 2015).

If a NAS were introduced due to hull fouling, we would expect this to occur at some time after the vessel has reached its destination port, rather than while the vessel is in transit. Due to the slow tow speeds, it is unlikely that hull-fouling species would release, either involuntarily or voluntarily, from the hull while the ship is being towed. If a NAS should release during towing, successful establishment would require: (1) settlement on suitable substrate in an area with favorable environmental conditions (i.e., flow, available food, water temperature, and salinity range) in order to survive, and (2) a sufficient number of propagules and environmental conditions suited for reproduction. Hull fouling organisms on inactive ships originate in the relatively shallow, nearshore, estuarine waters of the Navy's proposed origination ports. Environmental conditions at an origination port such as Newport News, Virginia are very different from conditions found in the offshore, deepwater habitats that make up the majority of the tow route to either Mobile or Brownsville. Considering the hydrodynamics and other environmental conditions of the open ocean or major shipping channel environments where hull fouling organisms could potentially release from an inactive ship, successful establishment of a NAS in these environments is extremely unlikely (Floerl and Inglis 2003). In summary, we find it extremely unlikely (to the point of being discountable) that a hull fouling NAS would be introduced in transit along the ship tow route as part of the proposed action.

The Navy has proposed hull cleaning of the ex-Enterprise as a mitigation measure if the destination port selected is either Mobile, Alabama or Brownsville, Texas. Hull cleaning has

been shown to be an effective mitigation measure for minimizing the risk of NAS by appreciably reducing the number, biomass, and diversity of hull fouling organisms. Pre-tow hull cleaning should have the added benefit of reducing the number of organisms that can attach to the hull while the ship is in transit (i.e., fewer surface areas for attaching, cementing, burrowing, embedding etc.), further reducing the potential for species transfer to result from the proposed action (Llansó and Sillett 2008). Diver surveys conducted after in-water biofouling removal was conducted on the ex-Independence reported that 99% of the hull was free from biofouling organisms post-cleaning (NUWC 2017). Davidson et al. (2008) reported a significant reduction in organism cover on the underwater surfaces (i.e., propeller, rudder, propeller shafts, struts, transverse hull transects and sea chests) of the Orion, a MARAD ship that was inactive for 13 years, post-cleaning using the self-propelled, diver driven SCAMP® cleaning machine. The mean percent area of exposed hull surface increased from 10.9% per sample prior to scrubbing to 62.7% after scrubbing. A large increase in bare space (a combination of 'hull surface' and 'organism scars' categories) was consistent across all depths of the hull and on the surfaces of the ship's running gear. This increase in bare space coincided clearly with reductions in encrusting species, barnacles, and filamentous biofouling (Davidson et al. 2008). These studies, comparing biofouling levels pre and post hull cleaning, indicate that this mitigation method is highly effective at reducing propagule pressure, and therefore, the likelihood of an NAS being introduced or becoming established. In addition, the relatively long tow duration from Newport News to either Mobile or Brownsville would likely further reduce the risk of a NAS introduction. Hull fouling species that may be capable of becoming established in these estuarine destination port locations are likely less adapted to survive in the open ocean environment of the transit route. Although we did not find any studies that specifically address the effects of tow time on a biofouling community, it is reasonable to assume that longer tow times would result in a lower number, biomass and diversity of surviving hull fouling organisms at the destination port (assuming all other factors are constant).

In addition, the ex-Enterprise has been moored in Newport News, Virginia since June 2013, and the hull of this ship was last painted in April 2017. Therefore, the ex-Enterprise would be expected to have less hull biofouling compared to other inactive ships with longer lay-up times that have not been painted in decades.

Therefore, we find that, due to the proposed hull cleaning mitigation (either in-water or dry dock) of the ex-Enterprise, long tow duration, and relatively recent hull painting of this ship, it is extremely unlikely (to the point of being discountable) that a NAS would be introduced via hull biofouling in the destination port of Mobile, Alabama or Brownsville, Texas. This effects determination is consistent with our effects determination in the 2019 ship tow programmatic biological opinion for similar ship tow routes and with hull cleaning mitigation measures (e.g., Norfolk, Virginia to Brownsville, Texas).

Conclusion

Based on this analysis, we concur with the Navy that the proposed action may affect, but is not likely to adversely affect the following ESA-listed species in the action area: Atlantic sturgeon – Gulf of Maine DPS; Atlantic sturgeon – New York Bight DPS; Atlantic sturgeon – Chesapeake DPS; Atlantic sturgeon – Carolina DPS; Atlantic sturgeon – South Atlantic DPS; shortnose sturgeon; Gulf sturgeon; giant manta ray; oceanic whitetip shark; scalloped hammerhead shark – Central and Southwest Atlantic DPS; green sea turtle - North Atlantic DPS; hawksbill sea turtle; Kemp's ridley sea turtle; leatherback sea turtle; loggerhead sea turtle –Northwest Atlantic Ocean DPS; blue whale; fin whale; North Atlantic right whale; Rice's whale; sei whale; and sperm whale.

Based on this analysis, we also concur with the Navy that the proposed action may affect, but is not likely to adversely affect designated critical habitat in the action area for the following species: loggerhead sea turtle –Northwest Atlantic Ocean DPS critical habitat; and Atlantic sturgeon – Chesapeake DPS critical habitat.

Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on ESA-listed species or critical habitat, to help implement recovery plans or develop information (50 C.F.R. §402.02). We recommend the following discretionary measures that we believe are consistent with this obligation and therefore may be considered by the Navy in relation to their 7(a)(1) responsibilities.

1. If in-water hull cleaning of the ex-Enterprise is conducted, we recommend the Navy conduct a biological survey of the hull to document the extent of biofouling on all underwater components (i.e., hull and niche areas listed above to the maximum extent practicable) of the inactive ship. This recommendation would support evaluation of assumptions made in our analysis regarding the effectiveness of in-water hull cleaning as a mitigation measure for reducing the risk of a NAS introduction. Biological surveys to determine species composition, density, and abundance of fouling organisms could be conducted at different stages including before hull cleaning mitigation, after hull cleaning but prior to departure, and sometime after arrival at the destination port. If biological surveys of the hull are conducted, we request the Navy provide NMFS with a brief report summarizing the results of those surveys.
2. If in-water hull cleaning of the ex-Enterprise is conducted, we recommend the Navy monitor water and sediment quality in the area of influence where the potential impacts of this activity may occur. Such monitoring would allow NMFS to validate some of the assumptions above regarding the effects of in-water hull cleaning on ESA-listed species and critical habitat. Water and sediment quality monitoring can be conducted at different stages including before in-water hull cleaning to establish a baseline, during in-water hull

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cleaning, and after in-water hull cleaning. Details regarding recommended water and sediment quality monitoring protocols can be found in the Incidental Take Statement issued with the 2019 ship tow programmatic opinion (see Section 14.4 *Terms and Conditions*; (NMFS 2019)). If this conservation recommendation is implemented, we request that the Navy provide NMFS with a brief report summarizing the results of water and sediment quality monitoring.

3. For the inactive ship tow scenarios involving hull cleaning mitigation (either in-water or in dry dock), we recommend the Navy require its contractor to commence towing of the ex-Enterprise as soon as practicable, but no later than four weeks, upon completion of mitigation to minimize the attachment of additional hull-fouling organisms to the hull in the period between hull cleaning and ship departure.
4. For the ex-Enterprise ship tow scenarios involving towing in the Atlantic Ocean, we recommend the Navy ensure that the towing contractor is familiar with the Right Whale Ship Strike Reduction Rule (50 CFR 224.105) and associated compliance measures. Refer to the NMFS website for details: https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-ship-strikes-north-atlantic-right-whales
5. We recommend that the Navy continue its research on in-water hull cleaning methods that minimize impacts to surrounding water bodies by collecting organisms, paint particles and other materials dislodged by the cleaning process for upland disposal (McClay et al. 2015).
6. We recommend that the Navy monitor the effects of shipbreaking activities on water quality, and report any potential exposure of ESA-listed resources to contaminants or hazardous materials discharged from the shipbreaking process to the NMFS Office of Protected Resources.

In order for NMFS' Office of Protected Resources ESA Interagency Cooperation Division to be kept informed of actions minimizing or avoiding adverse effects on, or benefiting, ESA-listed species or their critical habitat, the Navy should notify us of any conservation recommendations implemented as part of this proposed action.

Reinitiation of Consultation

Reinitiation of consultation is required and shall be requested by the federal agency, or by NMFS, where discretionary federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect an ESA-listed species or designated critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the ESA-listed species or designated critical habitat that was not considered in this concurrence letter; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR §402.16).

Please direct questions regarding this letter to Ron Salz, Consulting Biologist, 301-427-8487 and ron.salz@noaa.gov, or me at (301) 427-8464, or by email at jason.kahn@noaa.gov.

Sincerely,

KAHN.JASON.E.1365850379 Digitally signed by KAHN.JASON.E.1365850379 Date: 2023.03.15 09:21:10 -04'00'

Jason Kahn, Ph.D.
Acting Chief, ESA Interagency Cooperation
Division Office of Protected Resources

cc: Rose Johnson, Naval Sea Systems Command HQ, NAVSEA 09SE

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37

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D.1.2 U.S. Fish and Wildlife Service

D.1.2.1 Navy Request Letter for Informal Consultation

DEPARTMENT OF THE NAVY
PROGRAM EXECUTIVE OFFICER
AIRCRAFT CARRIERS
614 SICARD STREET SE
WASHINGTON NAVY YARD, DC 20376-7007

IN REPLY REFER TO
4560
312/159
13 Oct 2022

Mr. Ronald King
U.S. Fish & Wildlife Service
Alabama Ecological Services Field Office
1208 Main Street
Daphne, AL 36526

Dear Mr. King:

SUBJECT: ENDANGERED SPECIES ACT SECTION 7 INFORMAL CONSULTATION FOR THE TOWING OF THE DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65)

The United States (U.S.) Department of the Navy (Navy) has developed the enclosed Endangered Species Act (ESA) Section 7 informal consultation document for the proposed towing of the decommissioned, defueled U.S. Ship Enterprise aircraft carrier (CVN 65) from its current location at Newport News, Virginia to a commercial dismantling facility in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama. The purpose of the Proposed Action is to reduce the Navy inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy.

This informal consultation addresses the potential effects of the Proposed Action on species listed as endangered or threatened under ESA under the purview of the U.S. Fish and Wildlife Service (USFWS). The Proposed Action has the potential to affect the ESA-listed West Indian manatee (*Trichechus manatus*) in the destination port of Mobile. No ESA-listed species under the purview of the USFWS would be expected to occur at Newport News, Hampton Roads, or Brownsville. The Navy requests your concurrence that the towing of ex-Enterprise may affect, but is not likely to adversely affect, the ESA-listed West Indian manatee (*Trichechus manatus*) in the port of Mobile.

The Navy has completed prior consultations with USFWS for towing activities similar to the towing activities in the Proposed Action. On May 15, 2018, USFWS provided concurrence with the Navy's determination that a similar proposed action involving

Subj: MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION FOR THE TOWING OF THE DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65)

towing inactive ships from Mayport, Florida was not likely to adversely affect the West Indian manatee and its critical habitat.

I am requesting that you review the enclosed information and provide us with your comments and/or concurrence with our determinations in accordance with Section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*). If you have any technical questions, please feel free to contact [redacted]

Sincerely,

DUFF.HERBERT.RAYMOND.1120066281 Digitally signed by DUFF.HERBERT.RAYMOND.1120066281 Date: 2022.10.12 16:01:07 -04'00'

H.R. DUFF
APM, Inactivation
By Direction

Enclosure. 1. Endangered Species Act Section 7 Informal Consultation for the Towing of the Decommissioned, Defueled Ex-Enterprise (CVN 65)

2

D.1.2.2 U.S. Fish and Wildlife Concurrence Response

From: Lamont, Scott W <scott_lamont@fws.gov>
Sent: Monday, November 21, 2022 9:42 AM
To: Johnson, Rose M [redacted]; King, Ronald S <ronald_king@fws.gov>
Cc: [redacted]
Subject: [Non-DoD Source] Re: [EXTERNAL] For Submittal: ESA Section 7 Informal Consultation Package for Towing of the Ex-Enterprise

Good morning Rose,

As discussed this morning. The stamp reply on the bottom of the first page is the FWS response to this consultation. Our office often uses stamp replies in lieu of a formal letter on projects that aren't complicated, that don't require us to provide additional information, and that we determine can be completed using the verbiage in our "stamps." If you require a formal letter, please let me know? Otherwise, FWS consultation for this project (Mobile, AL) is completed at this time.

Thank you,

Scott

Scott Lamont
Fish and Wildlife Biologist

U.S. Fish and Wildlife Service
Alabama Ecological Services Field Office
1208-B Main Street
Daphne, AL 36526

251-441-5857 (phone)
251-441-6222 (fax)
scott_lamont@fws.gov

Working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

2022-0083920 SL

RECEIVED
OCT 14 2022
BY:

ENDANGERED SPECIES ACT SECTION 7
INFORMAL CONSULTATION

TOWING OF THE DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65)

Submitted to:
The United States Fish and Wildlife Service
646 Cajundome Blvd. Suite 400
Lafayette, Louisiana 70506

Submitted by:
Naval Sea Systems Command

Prepared By:
Naval Undersea Warfare Center Division, Newport RI
Environmental Branch, Mission Environmental Planning Program

U.S. Fish and Wildlife Service
1208-B – Daphne, Alabama 36526
Phone: 251-441-5181 Fax: 251-441-6222

No endangered or threatened species or critical habitat are known to occur in the project area. As described, the project will have no significant impact on fish and wildlife resources. IF PROJECT DESIGN CHANGES ARE MADE, PLEASE SUBMIT NEW PLANS FOR REVIEW.

William J. Pearson

OCT 25 2022

William J. Pearson, Field Supervisor Date #2
Alabama Ecological Services Field Office

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D.2 Magnuson-Stevens Fishery Conservation and Management Act

D.2.1 Navy Request Letter for Consultation

DEPARTMENT OF THE NAVY
PROGRAM EXECUTIVE OFFICER
AIRCRAFT CARRIERS
614 SICARD STREET SE
WASHINGTON NAVY YARD, DC 20376-7007

IN REPLY REFER TO
4560
312/160
13 Oct 2022

Karen Green
Regional Essential Fish Habitat Coordinator
National Oceanic and Atmospheric Administration Fisheries Service
Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930

Dear Ms. Green:

SUBJECT: MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION FOR THE TOWING OF THE DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65)

The United States (U.S.) Department of the Navy (Navy) has developed the enclosed Essential Fish Habitat (EFH) Assessment in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976, as amended (16 United States Code [U.S.C.] §§ 1801 *et seq.*) for the proposed towing of the decommissioned, defueled U.S. Ship Enterprise aircraft carrier (CVN 65) from its current location at Newport News, Virginia to a commercial dismantling facility in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama. The purpose of the Proposed Action is to reduce the Navy inactive ship inventory, eliminate costs associated with maintaining the ship in a safe stowage condition, and dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy.

The Navy has completed prior EFH consultations with the National Marine Fisheries Service (NMFS) for similar towing activities to the Proposed Action. In 2018, the Navy initiated consultation with NMFS on a programmatic plan to tow inactive Navy ships from common origination ports to common destination ports, including Norfolk, Virginia (near Newport News) and Brownsville. That consultation did not include Newport News Shipbuilding, which is the focus of this consultation.

During the EFH consultation, the only potential for towing of inactive ships to reduce the quality or quantity of EFH identified was from invasive species transfer, and NMFS recommended that the Navy implement hull cleaning methods as a conservation measure to reduce this risk. The Navy agreed to hull cleaning for certain tow

Subj: MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION FOR THE TOWING OF THE DECOMMISSIONED, DEFUELED EX-ENTERPRISE (CVN 65)

scenarios (i.e., like-to-like environments). In consideration of this prior agreement, hull cleaning would occur at Newport News Shipbuilding prior to towing to the ports of Mobile or Brownsville. Because hull cleaning would eliminate any potential negative effects on EFH at destination ports, only EFH designated at Newport News Shipbuilding will be considered within this consultation for the effects of the mitigation measure of hull cleaning.

The Navy has developed the enclosed Essential Fish Habitat Assessment to address the potential impact of the Proposed Action on EFH designated by NMFS, the Mid-Atlantic Fishery Management Council (MAFMC), and the New England Fishery Management Council (NEFMC). The Navy has determined that in-water hull cleaning at Newport News Shipbuilding, implemented as mitigation for the towing of the ex-Enterprise to Mobile or Brownsville, may adversely affect the quality of water column, benthic substrates, and biogenic habitats designated as EFH for the Bluefish; Summer Flounder, Scup, and Black Sea Bass; Atlantic Mackerel, Squid, and Butterfish; Atlantic Herring; Northeast Skate Complex; Northeast Multispecies; and Large Coastal Sharks Management Units. In-water hull cleaning as a mitigation measure for the Proposed Action also may adversely affect the quantity of biogenic habitats EFH for the Summer Flounder, Scup, and Black Sea Bass; Atlantic Herring; and Northeast Multispecies Management Units. However, these impacts are expected to be very minor in severity, short term in duration, and limited in spatial extent to the area immediately under and adjacent to the footprint of the vessel.

The Navy is requesting initiation of the MSA's EFH consultation process. If you have any technical questions please feel free to contact [redacted]

Sincerely,

DUFF.HERBERT.RAYMOND.1120066281 Digitally signed by DUFF.HERBERT.RAYMOND.1120066281 Date: 2022.10.12 16:00:28 -04'00'

H.R. DUFF
APM, Inactivation
By Direction

Enclosure. 1. Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Assessment for the Towing of the Decommissioned, Defueled Ex-Enterprise (CVN 65)

2

D.2.2 National Marine Fisheries Service Concurrence Letter

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930

November 28, 2022

Mr. H.A. Duff
APM, Inactivation
[redacted]

Re: Essential Fish Habitat Consultation, Towing of Ex-Enterprise (CVN 65)

Dear Mr. Duff:

We have reviewed the essential fish habitat (EFH) assessment submitted for the proposed towing of the decommissioned, defueled U.S. Ship Enterprise aircraft carrier (CVN 65) from its current location at Newport News Shipbuilding, Newport News, Virginia to a commercial dismantling facility in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama.

Project Background

As outlined in the EFH assessment the purpose of the Proposed Action is to reduce the Navy's inventory of inactive ships, thereby eliminating costs associated with maintaining the ship in a safe stowage condition, and dispose of legacy radiological and hazardous wastes in an environmentally responsible manner, while meeting the operational needs of the Navy. The Navy has completed previous EFH consultations for similar towing activities to the Proposed Action. In 2018, the Navy initiated programmatic consultation with NOAA Fisheries to tow inactive Navy ships from common origination ports to common destination ports, including Norfolk, Virginia and Brownsville, Texas. The programmatic consultation did not include Newport News Shipbuilding, Newport News, Virginia, located across Hampton Roads from Norfolk. Therefore, the focus of this EFH consultation is to include Newport News, Virginia as a common origination port for the purpose of the Navy's programmatic consultation. The potential to adversely affect EFH from the transfer of invasive species was identified during previous consultation for the towing of inactive ships. We recommended that the Navy implement hull-cleaning methods as a conservation measure to reduce risk under certain scenarios (i.e. towing ships from like-to-unlike environments).

Magnuson Stevens Fishery Conservation and Management Act (MSA)

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies such as the Navy to consult with us on any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect EFH identified under the MSA. The EFH regulations, 50 CFR Section 600.920, outline that consultation procedure.

EFH is defined by the MSA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The waters of lower James River/Hampton Roads at the site of the Proposed Action are designated as EFH for the various life stages of ten (10) federally managed species including: Atlantic butterfish (Peprilus triacanthus), Atlantic herring (Clupea harengus), black sea bass (Centopristis striata) bluefish, (Pomatomus saltatrix), clearnose skate (Raja eglanteria), red hake (Urophycis chuss), summer flounder (Paralichthys dentatus), windowpane flounder (Scopthalmus aquosus), sandbar shark (Carcharhinus plumbeus) and sand tiger shark (Carcharias taurus).

Newport News Shipbuilding is located on the lower James River at the confluence of Hampton Roads. The Navy has determined that in-water hull cleaning at Newport News Shipbuilding, implemented as a mitigation measure for the towing of the ex-Enterprise to Mobile, AL or Brownsville, TX may adversely affect EFH. Impacts to the water column, benthic substrates and biogenic habitats designated as EFH may occur. However, these impacts are expected to be very minor in severity, short term in duration, and limited in spatial extent to the area immediately under and adjacent the footprint of the vessel.

Hampton Roads is designated a habitat area of particular concern (HAPC) for sandbar shark and summer flounder and an anadromous fish use area by the Virginia Department of Game and Inland Fisheries (VDGIF). A HAPC is a designation that encompasses discrete subsets of EFH that provide extremely important ecological functions, are rare or located in an environmentally stressed area, or are particularly susceptible to human-induced degradation. Although noted in Table 3-1 of the EFH assessment, HAPC for sandbar shark does not exist in the vicinity of Newport News Shipbuilding. Likewise, HAPC for summer flounder is also not present as submerged aquatic vegetation and/or macrophytic algae beds do not exist in or adjacent the general project area.

As recommended in previous EFH consultations with NOAA Fisheries for the towing of decommissioned Navy ships, the proposed in-water hull cleaning at Newport News Shipbuilding shall be implemented as a mitigation measure for the towing of the ex-Enterprise to Mobile or Brownsville. Provided the hull cleaning is conducted as described in the EFH assessment, we concur with your determination that the Proposed Action will not substantially adversely affect EFH and have no additional conservation recommendations to provide.

Please also note that further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(j) if new information becomes available, or if the project is revised in such a manner that affects the basis for the above determination.

Other NOAA Trust Resources

Please note this EFH determination does not address threatened and endangered species under the purview of NOAA Fisheries Service. Please contacted Mr. Brian Hopper, NOAA Protected Resources Division (brian.d.hopper@noaa.gov, 410-573-4592) to discuss potential impacts to our trust resources protected under the Endangered Species Act.

Thank you for the opportunity to review the EFH assessment prepared for the proposed towing of the ex-Enterprise to a commercial dismantling facility. Please contact Mr. David O'Brien in our Virginia field office (david.l.obrien@noaa.gov, 804-684-7828) if you have any questions.

Sincerely,

GREENE.KAREN.M.1365830785 Digitally signed by GREENE.KAREN.M.1365830785 Date: 2022.11.28 16:18:50 -05'00'

Karen M. Greene
Mid-Atlantic Branch Chief
Habitat and Ecosystem Services Division

Cc: Rose Johnson, Navy
Nicole Woodward, NAO Corps
Brian Hopper, PRD
Ian Lundgren, OHC
David Dale, SERO

D.3 Coastal Zone Management Act

D.3.1 Alabama

D.3.1.1 Navy Transmittal Letter for General Negative Determination Review

DEPARTMENT OF THE NAVY
PROGRAM EXECUTIVE OFFICER
AIRCRAFT CARRIERS
614 SICARD STREET SE
WASHINGTON NAVY YARD, DC 20376-7007

IN REPLY REFER TO
4560
312/163
13 Oct 2022

Mr. J. Scott Brown
Alabama Department of Environmental Management
3664 Dauphin Street, Suite B
Mobile, AL 36608

Dear Mr. Brown:

SUBJECT: COASTAL ZONE MANAGEMENT ACT GENERAL NEGATIVE DETERMINATION FOR THE TOWING OF INACTIVE NAVY SHIPS

The United States (U.S.) Department of the Navy (Navy) has developed the enclosed General Negative Determination (GND) for your review. The proposed action entails the towing of inactive Navy ships to dismantling facilities and between inactive ship facilities. The purpose of the Proposed Action is for the Navy to tow inactive ships from berthing ports to dismantling facilities, or between Navy facilities, to manage inventory while meeting Navy operational needs. For the purposes of this GND, the Proposed Action would be limited to the towing of inactive ships to and from Alabama ports.

In accordance with the Coastal Zone Management Act (CZMA) of 1972 (16 United States Code [U.S.C.] § 1456(c) and 15 Code of Federal Regulations [CFR] part 930 Subpart C), the Navy has conducted a review of the Proposed Action for consistency with the Alabama Department of Environmental Management's enforceable policies under the Alabama Coastal Area Management Program. The enclosed GND concludes that the Proposed Action would have no effect on any coastal use or resource in the Alabama coastal zone.

I am requesting that you review the enclosed information and provide us with your comments and/or concurrence with our determinations in accordance with the CZMA (16 U.S.C. §§ 1451 et seq.) Section 307(c)(1) and 15 CFR Part 930, Subpart C 16 U.S.C. 1801 et seq.). If you have any technical questions, please feel

Subj: COASTAL ZONE MANAGEMENT ACT GENERAL NEGATIVE DETERMINATION FOR THE TOWING OF INACTIVE NAVY SHIPS

free to contact [redacted]

Sincerely,

DUFF.HERBERT.RAYMOND.1120066281 Digitally signed by DUFF.HERBERT.RAYMOND.1120066281 Date: 2022.10.13 08:59:30 -04'00'

H.R. DUFF
APM, Inactivation
By Direction

Enclosure. 1. Coastal Zone Management Act General Negative Determination for Alabama, Towing of Inactive Navy Ships

2

D.3.1.2 Alabama Department of Environmental Management Concurrence Email

From: Brown, Scott <jsb@adem.alabama.gov>
Sent: Thursday, October 20, 2022 7:21 AM
To: Bausher, Anna W CIV USN NAVFAC NW SVD WA (USA) [redacted]
Cc: McNeill, Catherine <CMcNeill@adem.alabama.gov>
Subject: [Non-DoD Source] ACAMP-2023-005-FAA • 4560 | 312-163 | 13 Oct 2022 | CZMA GND for Towing of Inactive Navy Ships

Good morning Anna and Rose:

RE: 4560
312-163
13 Oct 2022

This response is to confirm the Alabama Department of Environmental Management, the State of Alabama's implementing agency of the enforceable policies of the Alabama Coastal Area Management Program, received and reviewed the U. S. Navy's negative determination for the towing of inactive Navy ships into the coastal waters of Alabama as described in the attachment. Pursuant to Title 15CFR930 §930.35(c), Alabama concurs with the U.S. Navy's negative determination.

Call or email anytime with questions.

v/r,

J. Scott Brown, Chief
Mobile Field Office| ADEM
3664 Dauphin Street, Suite B | Mobile, Alabama 36608
Telephones: 251.304.1176 Office| 334.850.4641 Cell
eMail: jsb@adem.alabama.gov
www.adem.alabama.gov

Email sent from or received by this sender - including any attachments therewith - is subject to the Alabama Open Records Act and may be disclosed to third parties.

D.3.2 Virginia

D.3.2.1 Navy Transmittal Letter for General Negative Determination Review

DEPARTMENT OF THE NAVY
PROGRAM EXECUTIVE OFFICER
AIRCRAFT CARRIERS
614 SICARD STREET SE
WASHINGTON NAVY YARD, DC 20376-7007

IN REPLY REFER TO
4560
312/162
13 Oct 2022

Ms. Bettina Rayfield
Virginia Department of Environmental Quality
Office of Environmental Impact Review
1111 East Main St, Suite 1400
Richmond, VA 23219

Dear Ms. Rayfield:

SUBJECT: COASTAL ZONE MANAGEMENT ACT GENERAL NEGATIVE DETERMINATION FOR THE TOWING OF INACTIVE NAVY SHIPS

The United States (U.S.) Department of the Navy (Navy) has developed the enclosed General Negative Determination (GND) for your review. The proposed action entails the towing of inactive Navy ships to dismantling facilities and between inactive ship facilities. The purpose of the Proposed Action is for the Navy to tow inactive ships from berthing ports to dismantling facilities, or between Navy facilities, to manage inventory while meeting Navy operational needs. For the purposes of this GND, the Proposed Action would be limited to the towing of inactive ships to and from Virginia ports.

In accordance with the Coastal Zone Management Act (CZMA) of 1972 (16 United States Code [U.S.C.] § 1456(c) and 15 Code of Federal Regulations [CFR] part 930 Subpart C), the Navy has conducted a review of the Proposed Action for consistency with the Virginia Department of Environmental Quality's enforceable policies under the Virginia Coastal Zone Management Program. The enclosed GND concludes that the Proposed Action would have no effect on any coastal use or resource in the Virginia coastal zone.

I am requesting that you review the enclosed information and provide us with your comments and/or concurrence with our determinations in accordance with the CZMA (16 U.S.C. §§ 1451 et seq.) Section 307(c)(1) and 15 CFR Part 930, Subpart C 16 U.S.C. 1801 et seq.). If you have any technical questions, please feel

Subj: COASTAL ZONE MANAGEMENT ACT GENERAL NEGATIVE DETERMINATION FOR THE TOWING OF INACTIVE NAVY SHIPS

free to contact [redacted]

Sincerely,

DUFF.HERBERT.RAYMOND.1120066281 Digitally signed by DUFF.HERBERT.RAYMOND.1120066281 Date: 2022.10.13 09:00:13 -04'00'

H.R. DUFF
APM, Inactivation
By Direction

Enclosure. 1. Coastal Zone Management Act General Negative Determination for Virginia, Towing of Inactive Navy Ships

2

D.3.2.2 Virginia Department of Environmental Quality Concurrence Letter

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219
P.O. Box 1105, Richmond, Virginia 23218
(800) 592-5482 FAX (804) 698-4178
www.deq.virginia.gov

Travis A. Voyles
Acting Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
(804) 698-4020

November 22, 2022

Ms. Anna Bausher, AICP
Environmental Planner (EV23)
Naval Facilities Engineering Systems Command (NAVFAC) Northwest
[redacted]

RE: General Negative Determination for the Towing of Inactive Navy Ships, U.S. Navy, Hampton Roads, DEQ 22-162F

Dear Ms. Bausher:

The Commonwealth of Virginia has completed its review of the General Negative Determination (GND) for the above-referenced project. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of GNDs submitted under the Coastal Zone Management Act and responding to appropriate officials on behalf of the Commonwealth. This letter is in response to the GND dated October 2022 (received October 13, 2022), submitted the U.S. Navy. The following agencies participated in this review:

Department of Environmental Quality
Virginia Marine Resources Commission
Virginia Institute of Marine Science

In addition, the Department of Wildlife Resources was invited to comment on the proposal.

PROJECT DESCRIPTION

The U.S. Navy proposes the towing of inactive ships from origination ports within the Hampton Roads Metropolitan Area (e.g. Newport News, Norfolk) to destination ports within or outside of Virginia's waters. Additionally, the Navy may tow inactive ships from origination ports outside of Virginia into the Hampton Roads Metropolitan Area. During

transit, the tug and tow would typically travel at speeds less than 10 knots in the open ocean. Speed would be reduced while in port areas to below 10 knots and consistent with local conditions and restrictions. The use of one or more assist tug boats would be required depending on the size of the inactive Navy ship being towed. Towing would be performed by a qualified contractor in accordance with requirements of the *U.S. Navy Towing Manual* (Department of the Navy 2002), as well as any specific guidelines for individual ships (e.g., Naval Sea Systems Command Instruction 4740.12, *Towing and Preparation for Storage Specification for Inactivated Defueled Nuclear Powered Aircraft Carriers* for towing of nuclear vessels). The contractor would adhere to all applicable safety requirements. Commercial maritime pilots would be used for departures from and entries into ports. The towing contractor would prepare a towing plan and outline the procedures and guidelines for towing the unmanned ship. The Navy arranges for dismantlement of inactive vessels, including towing to the dismantlement location, via Navy contract. Dismantling and towing would be conducted by private contractors in accordance with all federal, state, and local laws and regulations.

PUBLIC PARTICIPATION

In accordance with Title 15, Code of Federal Regulations (CFR), §930.42, the public was invited to participate in the review of the GND. Public notice of this proposed action was published in the OEIR Program Newsletter and on the DEQ website from October 24, 2022 through November 14, 2022. No public comments were received in response to the notice.

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

Pursuant to the Coastal Zone Management Act of 1972 (CZMA), as amended, and the federal consistency regulations implementing the CZMA (15 CFR, Part 930, Subpart C, Section 930.30 *et seq.*), federal activities located inside or outside of Virginia's designated coastal management area that can have reasonably foreseeable effects on coastal resources or coastal uses must be implemented in a manner consistent, to the maximum extent practicable, with the Virginia Coastal Zone Management (CZM) Program. The Virginia CZM Program consists of a network of programs administered by several agencies. DEQ coordinates the review of General Negative Determinations with agencies administering the enforceable policies and advisory policies of the Virginia CZM Program.

FEDERAL CONSISTENCY CONCURRENCE

Based on our review of the General Negative Determination and the comments submitted by agencies administering the applicable enforceable policies of the Virginia CZM Program, DEQ concurs that the proposed activity is consistent to the maximum extent practicable with the Program. If, prior to implementation, the proposed activities should change significantly and any of the enforceable policies of the Virginia CZM Program would be affected, pursuant to 15 CFR, Part 930, Subpart C, §930.46(a), the Navy must submit supplemental information to DEQ for review and approval. However,

other state approvals that may apply to this project are not included in this consistency concurrence. Therefore, the applicant must ensure that this project is constructed and operated in accordance with all applicable federal, state and local laws and regulations.

FEDERAL CONSISTENCY ANALYSIS

According to information in the GND, the proposed project would have no effect on the enforceable policies of the Virginia CZM Program. The agencies responsible for the administration of the applicable enforceable policies of the Virginia CZM Program agree with the determination. The Navy must ensure that the proposed action is consistent with the aforementioned policies. In addition, DEQ encourages the Navy to consider the effects of the proposal on the advisory policies of the Virginia CZM Program in accordance with 15 CFR §930.39(c). The analysis that follows responds to the discussion of the enforceable policies of the Virginia CZM Program that apply to this project and review comments submitted by agencies that administer the enforceable policies.

1. Tidal and Nontidal Wetlands. According to the GND (page 3-2), the Proposed Action would involve passage of towed ships through navigable channels and into and out of established industrial ports. No development would occur, and the Proposed Action would not disturb or alter tidal or non-tidal wetlands.

1(a) Agency Jurisdiction. The purpose of the policy is to preserve and protect wetlands and non-tidal surface waters, to prevent their despoliation and destruction, and accommodate necessary economic development in a manner consistent with wetlands preservation. Impacts to wetlands and streams shall be avoided or minimized to the maximum extent practicable. Tidal Wetlands are administered by the Virginia Marine Resources Commission (VMRC) under the authority of the Tidal Wetlands Act of 1972 (*Virginia Code § 28.2-1301 and -1308; 4 VAC § 20-390-20*). Tidal and Nontidal Wetlands are administered by the Department of Environmental Quality (DEQ) through the Virginia Water Protection Permit program and includes Water Quality Certification pursuant to Section 401 of the Clean Water Act (*Virginia Code §§ 62.1-44.15:20 and -44.15:21; and 9 VAC §§ 25-210-10, -210-45, 210-80, 260-10, -380, -390*).

1(b) Agency Findings.

(i) Virginia Marine Resources Commission

VMRC finds that the Proposed Action has no foreseeable impact on tidal and nontidal wetlands enforceable policy under its jurisdiction. As proposed, VMRC has no objection to the consistency finding provided by the Navy.

Towing of Inactive Navy Ships
Navy GND, DEQ 22-162F

(ii) Department of Environmental Quality

The Virginia Water Protection (VWP) Permit program at the DEQ Tidewater Regional Office (TRO) finds that the proposed activity does not propose impacts to surface waters or wetlands; therefore, VWPP authorization is not required.

1(c) Conclusion. The proposed project is consistent to the maximum extent practicable with the tidal and nontidal wetlands management enforceable policy of the Virginia CZM Program.

For additional information regarding VWP Permit program comments contact DEQ-TRO, Jeff Hannah at (757) 407-2510 or jeff.hannah@deq.virginia.gov or for VMRC comments, contact Ben Nettleton at (757) 247-8027 or ben.nettleton@mrc.virginia.gov.

2. Subaqueous Lands. According to the GND (page 3-2), the Proposed Action would be limited to the passage of towed ships, which would not impact the seafloor. Therefore, state-owned subaqueous lands would be unaffected.

2(a) Agency Jurisdiction. All decisions affecting subaqueous lands shall be guided by the Commonwealth's General Policy to conserve, develop, and utilize its natural resources, its public lands, and its historical sites and buildings and to protect its atmosphere, lands, and waters from pollution, impairment, or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth. The General Assembly has authorized VMRC to grant or deny any use of state-owned bottomlands, including dredging, aquaculture, the taking and use of material from the bottomland, and the placement of wharves, bulkheads, and fill. (*Virginia Code §§ 28.2-1200, -1203, -1204 and -1205*).

2(b) Agency Findings. VMRC finds that the Proposed Action would not impact state-owned submerged lands. As proposed, VMRC has no objection to the consistency finding provided by the Navy.

2(c) Conclusion. The proposed project is consistent to the maximum extent practicable with the subaqueous lands enforceable policy of the Virginia CZM Program.

For additional information regarding VMRC comments, contact Ben Nettleton at (757) 247-8027 or ben.nettleton@mrc.virginia.gov.

3. Dunes and Beaches. The GND (page 3-2) states that the Proposed Action would not involve development or any activity upon coastal sand dunes or beaches.

3(a) Agency Jurisdiction. The policy promotes the preservation and protection of coastal primary sand dunes and beaches, to prevent their despoliation and destruction, and whenever practical, to accommodate necessary economic development in a manner consistent with the protection of such features. Dune and beach protection is carried out

pursuant to the Coastal Primary Sand Dune Protection Act as administered by VMRC (*Virginia Code §§ 28.2-1401 and -1408*).

3(b) Agency Findings. VMRC confirms that the Proposed Action has no foreseeable impact on the dunes and beaches enforceable policy. As proposed, VMRC has no objection to the consistency finding provided by the Navy.

3(c) Conclusion. The proposed action is consistent to the maximum extent practicable with the dunes and beaches enforceable policy of the Virginia CZM Program.

For additional information regarding VMRC comments, contact Ben Nettleton at (757) 247-8027 or ben.nettleton@mrc.virginia.gov.

4. Marine Fisheries. According to the GND (page 4), the Proposed Action would involve towing of inactive ships through identified navigation channels. There would be no impact on marine fisheries or engagement in fishing activities.

4(a) Agency Jurisdiction. The policy stresses the conservation and promotion of seafood and marine resources of the Commonwealth, including fish, shellfish and marine organisms, and the management of the fisheries to maximize food production and recreational opportunities within the Commonwealth's territorial waters. The policy is administered by VMRC (*Virginia Code §§ 28.2-101, -201, -203, -203.1, -225, -551, -600, -601, -603 -618, and -1103, -1203 and the Constitution of Virginia, Article XI, Section 3*).

4(b) Agency Findings.

(i) Virginia Marine Resources Commission

VMRC confirms that the Proposed Action has no foreseeable impact on the marine fisheries enforceable policy. As proposed, VMRC has no objection to the consistency finding provided by the Navy.

(ii) Virginia Institute of Marine Science

The Virginia Institute of Marine Science (VIMS) does not expect adverse impacts to the coastal and marine environment from the described activities provided they proceed as planned and with all precautions in place such that any vessel under tow is under control at all times and remains within dredged navigation channels.

4(c) Conclusion. The proposed action is consistent to the maximum extent practicable with the marine fisheries enforceable policy of the Virginia CZM Program.

For additional information, contact VMRC, Ben Nettleton at (757) 247-8027 or ben.nettleton@mrc.virginia.gov and/or VIMS, Emily Hein at (804) 684-7482 or eahein@vims.edu.

Towing of Inactive Navy Ships
Navy GND, DEQ 22-162F

5. Point Source Air Pollution. According to the GND (page 3-3), the Proposed Action would involve only the towing of inactive Navy ships to and from established industrial ports within the coastal zone. Occasional towing of vessels, while contributing to overall levels of pollutants, would not appreciably alter the air pollution levels in these industrial ports or within Virginia's coastal zone. The Proposed Action would not involve asphalt paving operations, open burning, or operation of a stationary source of air pollution.

5(a) Agency Jurisdiction. The policy is administered by DEQ through the federal Clean Air Act and Virginia's legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards. It is the policy of the Commonwealth to abate, control, and prohibit air pollution throughout the Commonwealth (*Virginia Code § 10.1-1308*), to include: asphalt paving operations in volatile organic compound emission control areas (*Virginia Code §§ 10.1-1308 and -1322; 9 VAC §§ 5-20-206 and -45-780*), open burning (*Virginia Code §§ 10.1-1308 and -1322; 9 VAC §§ 5-80-1105, -130-10, -130-30 to -50, 20-60-30, and 5-60-200*), fugitive dust emissions (*Virginia Code §§ 10.1-1308 and -1322; 9 VAC §§ 5-50-90 and -40-90*), state operation permits (*Virginia Code §§ 10.1-1308 and -1322; 9 VAC § 5-80-800*), and new source review (*Virginia Code §§ 10.1-1308 and -1322; 9 VAC §§ 5-80-1100, -1400, -1605, and -2000*).

5(b) Agency Findings. The DEQ Air Division finds that Hampton Roads is an ozone (O_3) attainment area and emission control area for volatile organic compounds (VOCs) and oxides of nitrogen (NO_x).

5(c) Recommendation. All precautions should be taken to restrict the emissions of VOCs and NO_x principally by controlling or limiting the burning of fossil fuels.

5(d) Conclusion. The proposed action is consistent to the maximum extent practicable with the point source air pollution enforceable policy of the Virginia CZM Program.

For additional information regarding air comments, contact the DEQ Air Division, Tom Ballou at (804) 664-3515 or thomas.ballou@deq.virginia.gov.

6. Point Source Water Pollution. According to the GND (page 3-3), the Proposed Action includes towing of inactive Navy ships. No discharge of pollutants into the waters of Virginia would occur during the towing process.

6(a) Agency Jurisdiction The policy is administered by DEQ to protect existing high quality state waters and restore all other state waters to permit all reasonable public uses and support the propagation and growth of all aquatic life. Legal authority is granted by the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to Section 402 of the federal Clean Water Act and administered by DEQ as the Virginia Pollutant Discharge Elimination System (VPDES) permit program (*Virginia Code § 62.1-44.2; 9 VAC § 25-31-20*).

Towing of Inactive Navy Ships
Navy GND, DEQ 22-162F

6(b) Agency Findings. The VPDES program at DEQ-TRO finds that the proposed action does not appear to result in any point source discharges of process water or wastewater that would necessitate a VPDES permit.

6(c) Conclusion. The proposed action is consistent to the maximum extent practicable with the point source water pollution enforceable policy of the Virginia CZM Program.

For additional information, contact DEQ-TRO, Janet Weyland at (757) 518-2151 or janet.weyland@deq.virginia.gov.

Thank you for the opportunity to review and respond to the General Negative Determination for the Towing of Inactive Navy Ships in Hampton Roads, Virginia. The detailed comments submitted by reviewing agencies are attached. Please contact me at (804) 659-1915 or John Fisher at (804) 659-1919 for clarification of these comments.

Sincerely,

Bettina Rayfield, Program Manager
Environmental Impact Review and Long-Range Priorities

Enclosures

Ec: Amy Martin, DWR
Claire Gorman, VMRC
Emily Hein, VIMS

7

DEPARTMENT OF ENVIRONMENTAL QUALITY
TIDEWATER REGIONAL OFFICE

Environmental Impact Review
Coordination Review

To: Office of Environmental Impact Review

From: Jeff Hannah, Regional VWPP Program Manager

Date: November 4, 2022

Project: Towing of Inactive Navy Ships, DEQ #22-162F

As requested, the DEQ Tidewater Regional Office has reviewed the supplied information and offers the following comments:

Air Compliance Program :
The following air regulations may be applicable: Virginia Administrative Code 9 VAC 5-50-60 *et seq*. which addresses the abatement of visible emissions and fugitive dust emissions, and Virginia Administrative Code 9 VAC 5-130-10 et *seq*. which addresses open burning. For additional information, contact John Brandt, DEQ-TRO at (757)407-2341.

Land Program (Solid and Hazardous Waste):
All construction and demolition waste, including any excess soil, must be characterized in accordance with the Virginia Hazardous Waste Management Regulations and disposed of at an appropriate facility as applicable.
For additional information, contact Melinda Woodruff, DEQ-TRO at melinda.woodruff@deq.virginia.gov .

Stormwater:
No comment as proposed action does not include land disturbance.

Virginia Water Protection Permit Program (VWPP):
The proposed activity does not propose impacts to surface waters or wetlands; therefore, VWPP authorization is not required. However, if impacts to surface waters or wetlands are identified, the proposed activity may require VWPP authorization under §401 of the Clean Water Act, Virginia Code §62.1-44.15:20, and Virginia Administrative Code 9 VAC 25-210-10 *et seq*. Provided that any and all necessary permits are obtained and complied with, the project will be consistent with DEQ program requirements. For additional information, contact Jeff Hannah, DEQ-TRO at (757)407-2510.

Water Permit Program (VPDES):

No comments as there does not appear to be any point source discharges of process water or wastewater associated with this project that would necessitate a VPDES permit.

1 of 1

Commonwealth of Virginia

Fisher, John <john.fisher@deq.virginia.gov>

DEQ #22-162F Inactive Navy Ships

1 message

Emily A. Hein <eahein@vims.edu> Fri, Nov 11, 2022 at 1:41 PM
To: "John.Fisher@deq.virginia.gov" <John.Fisher@deq.virginia.gov>
Cc: Advisory <advisory@vims.edu>

Good afternoon, John,

We have reviewed the materials for the Negative Determination for the Navy Towing of Inactive Navy Ships (DEQ #22-162F). We have no comments on the determination and expect no adverse impacts to the coastal and marine environment from the described activities provided they proceed as planned and with all precautions in place such that any vessel under tow is under control at all times and remains within dredged navigation channels.

Please let me know if you have any additional questions.

Best,

Emily

Emily Hein

Pronouns: she/her
Assistant Director for Advisory Services

VIMS Research and Advisory Services

eahein@vims.edu, 804-684-7482

VIMS | William & Mary
Virginia Institute of Marine Science

COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Bldg 96
Fort Monroe, VA 23651-1064

Travis A. Voyles
Acting Secretary of Natural and Historic Resources

Jamie L. Green
Commissioner

November 17, 2022

Department of Environmental Quality
Attn: John Fisher
1111 East Main Street
Richmond, VA 23219

Re: Towing of Inactive Navy Ships DEQ #22-162F

Dear Mr. Fisher,

This will respond to the request for comments regarding the Negative Determination for the Towing of Inactive Navy Ships project (DEQ #22-162F), prepared by the U.S. Department of the Navy. Specifically, the U.S. Department of the Navy has proposed to tow inactive Navy ships to dismantling facilities and between inactive ship facilities in the cities of Norfolk and Newport News, Virginia.

We reviewed the provided documents and found the proposed project is outside the jurisdictional areas of the Virginia Marine Resources Commission (VMRC) and will not require a permit from this agency.

Please be advised that the Virginia Marine Resources Commission (VMRC) pursuant to Chapters 12, 13, and 14 of Title 28.2 of the Code of Virginia administers permits required for submerged lands, tidal wetlands, and beaches and dunes. The VMRC administers the enforceable policies of fisheries management, subaqueous lands, tidal wetlands, and coastal primary sand dunes and beaches, which comprise some of Virginia's Coastal Zone Management Program. VMRC staff has reviewed the submittal and offers the following comments:

Fisheries and Shellfish: No proposed impacts to fisheries or shellfish harvesting grounds.

Submerged Lands: No proposed impacts to state-owned submerged lands.

Tidal Wetlands: None in close proximity to the project area.

Beaches and Coastal Primary Sand Dunes: None in close proximity to the project area.

As such, this project has no foreseeable impact on the VMRC's enforceable policies. As proposed, we have no objection to the consistency findings provided by the applicant. Should the proposed project change, a new review by this agency may be required relative to these jurisdictional areas.

An Agency of the Natural Resources Secretariat
www.mrc.virginia.gov
Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD

Please contact me at (757) 247-8027 or by email at ben.nettleton@mrc.virginia.gov if you have questions. Thank you for the opportunity to comment.

Sincerely,

Ben Nettleton
Environmental Engineer, Habitat Management

BN/cg
HM

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: John Fisher

We thank **OEIR** for providing DEQ-AIR an opportunity to review the following project:
Accordingly, I am providing following comments for consideration.

Document Type: Negative Determination
Project Sponsor: U.S. Department of the Navy
Project Title: Towing of Inactive Navy Ships
Project Number: DEQ #22-162F

PROJECT LOCATION: X OZONE ATTAINMENT
AND EMISSION CONTROL AREA FOR NOX & VOC

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO: X CONSTRUCTION
☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-45-760 et seq. – Asphalt Paving operations
3. 9 VAC 5-130 et seq. – Open Burning
4. 9 VAC 5-50-60 et seq. Fugitive Dust Emissions
5. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
6. ☐ 9 VAC 5-60-300 et seq. – Standards of Performance for Toxic Pollutants
7. ☐ 9 VAC 5-50-400 Subpart____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
8. ☐ 9 VAC 5-80-1100 et seq. of the regulations – Permits for Stationary Sources
9. ☐ 9 VAC 5-80-1605 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
10. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
11. ☐ 9 VAC 5-80-800 et seq. Of the regulations – State Operating Permits. This rule may be applicable to _____

COMMENTS SPECIFIC TO THE PROJECT:

All precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_x).

K. S. Narasimhan

(Kotur S. Narasimhan)
Office of Air Data Analysis **DATE: October 21, 2022**

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Environmental Impact Statement/ Overseas Environmental Impact Statement

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants

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Appendix E Radiological Evaluation of Reactor Plant Disposal Alternatives

E.1 Introduction

The Naval Nuclear Propulsion Program (NNPP) has a history of safe operations involving reactor plant dismantlement, packaging, and shipment for disposal. This history of safe operations includes the disposition of 140 shipboard reactor packages and 3 land-based prototype reactor plants (DOE, 1997a, 1997b, 1998a, 1998b). The consequences of radiation exposure and contamination are of interest to the general public. Therefore, this Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) addresses the potential radiological impacts on workers, the public, and the environment from reactor plant disposal.

Section E.2 provides information about the nature of radiation, explains the basic concepts used to evaluate radiation health effects, and provides perspective on the calculation of cancer and risk. Section E.3 describes the uncertainties associated with the radiation exposure analysis.

Some of the data in this Appendix is presented using scientific notation. Scientific notation is commonly used to represent very large or small numbers. It consists of a number multiplied by the appropriate power of 10. For example, 0.0000035 would be represented as 3.5×10^{-6} and 3,500,000 would be represented as 3.5×10^{6}. Significant digits are the number of digits needed to express the precision of the calculation. Each calculated result is rounded to two significant digits in this Appendix.

E.2 Radiation and Human Health

Since the inception of nuclear power, scientists have cautioned that exposure to ionizing radiation in addition to that from natural background may involve some risk. The National Committee on Radiation Protection and Measurements (NCRP) in 1954 (NCRP, 1958) and the International Commission on Radiological Protection (ICRP) in 1958 (ICRP, 1959) both recommended that exposures should be kept as low as practicable and that unnecessary exposure should be avoided to minimize this risk. The International Commission on Radiological Protection in 1962 (ICRP, 1962) explained the assumed risk as follows:

> "The basis of the Commission's recommendations is that any exposure to radiation may carry some risk. The assumption has been made that, down to the lowest levels of dose, the risk of inducing disease or disability in an individual increases with the dose accumulated by the individual, but is small even at the maximum permissible levels recommended for occupational exposure."

The National Academy of Sciences-National Research Council Advisory Committee (NAS-NRC) on the Biological Effects of Ionizing Radiation included similar statements in its reports in the 1956–1961 period and most recently in 1990 (NAS-NRC, 1990) and 2006 (NAS-NRC, 2006). In 1960, the Federal Radiation Council (also referred to as the FRC) stated (FRC, 1960) that its radiation protection guidance did not differ substantially from recommendations of the National Committee on Radiation Protection and Measurements, the International Commission on Radiological Protection, and the National Academy of Sciences. This statement was again reaffirmed in 1987 (EPA, 1987).

One conclusion from these reports is that radiation exposures to personnel should be minimized, but this is not a new conclusion. Minimizing radiation exposure to personnel has been a major driving force of the NNPP since its inception in 1948.

This section provides information about the nature of radiation, explains basic concepts used to evaluate radiation health effects, and provides perspective on the calculation of cancer and risk.

E.2.1 Nature of Radiation

Radiation is the emission and propagation of energy through matter or space as waves or particles. Radiation generally results from processes that occur naturally. The most commonly recognized form of radiation is electromagnetic radiation emitted over a specific range of wavelengths and energies. Visible light is part of the spectrum of electromagnetic radiation. Radiation of longer wavelengths and lower energy includes infrared radiation (known for heating material when the material and the radiation interact) and radio waves. Electromagnetic radiation of shorter wavelengths and higher energy (which are more penetrating) includes ultraviolet radiation (which causes sunburn) and forms of ionizing radiation such as x-rays and gamma radiation.

Ionizing radiation is radiation that has sufficient energy to displace electrons from atoms or molecules to produce ions. The ions have the ability to interact with other atoms or molecules; in biological systems, this interaction can cause damage in tissue or to an organism.

Radioactivity is the property or characteristic of an unstable atom to undergo spontaneous transformation (to disintegrate or decay) with the emission of energy as radiation to reach a more stable state. The result of the process, called radioactive decay, is the spontaneous transformation of an unstable atom (a radionuclide) into a different nuclide, accompanied by the release of energy (as radiation) as the atom reaches a more stable, lower energy configuration.

Radiation that originates outside of an individual's body is called external or direct radiation. Such radiation can come from an x-ray machine or from radioactive materials (materials or substances that contain radionuclides), such as radioactive waste or radionuclides in soil. When radioactive materials are deposited on a surface that surface is said to be contaminated. Contamination is material that contains radiation emitting nuclides.

Internal radiation can get inside a person's body following intake of radioactive material or radionuclides through ingestion or inhalation. Once in the body, the fate of a radioactive nuclide is determined by its chemical structure and how it is metabolized. The residence time of a radionuclide in the body is commonly called the biological half-life. If the material is soluble, it might be dissolved in bodily fluids and transported to and deposited in various body organs; if it is insoluble, it might move through the gastrointestinal tract or into the lungs.

E.2.2 Source of Radiation

The radiation discussed in this report originates from pressurized water reactors. In this type of reactor, water circulates through a closed piping system to transfer heat from the reactor core to a secondary steam system isolated from the reactor cooling water. Trace amounts of corrosion and wear products are carried by reactor coolant from reactor plant metal surfaces. Some of these corrosion and wear products are deposited on the reactor core and become radioactive from exposure to neutrons. Reactor coolant carries some of these radioactive products through the piping systems where a portion of the radioactivity is removed by a purification system. Most of the remaining radionuclides transported from the reactor core deposit in the piping systems.

The reactor core is installed in a heavy-walled pressure vessel within a primary shield. The primary shield limits radiation exposure from the gammas and neutrons produced when the reactor is operating. The reactor vessel and non-fuel components within the reactor vessel become radioactive by exposure to neutron radiation produced by the operating reactor. Reactor plant piping systems are installed primarily inside a reactor compartment that is itself surrounded by a secondary shield. Access to the reactor compartment is permitted only after the reactor is shut down. Most radiation exposure to personnel comes from inspection, maintenance, and repair inside the reactor compartment. The major source of this radiation is cobalt-60 deposited inside the piping systems. Cobalt-60 emits two high-energy gammas and a low-energy beta for every radioactive decay. Its half-life is 5.3 years.

Neutrons (produced when reactor fuel fissions) are also shielded by the primary and secondary shields. Radiation exposure to personnel from these neutrons during reactor operation is much less than from gammas. After reactor shutdown, when shipyard and other support facility work is executed, no neutron exposure is detectable. Therefore, the radiation exposures discussed in this EIS/OEIS are nearly all from gamma radiation.

E.2.3 Radiation Measuring Units

A variety of units are used to measure radiation. These units determine the amount, type, and intensity of radiation. Amounts of radiation or its effects can be measured in units of Curies, radiation absorbed dose (rad), or dose equivalent (roentgen equivalent man, or rem). The Curie describes the rate at which a material is emitting nuclear radiation (i.e., activity). The Curie is defined as exactly 3.7×10^{10} disintegrations (decays) per second. The rad is the unit that measures the amount of energy imparted to matter per unit mass. The total energy absorbed per unit quantity of matter is referred to as absorbed dose (or simply dose). One rad is equal to the amount of radiation that leads to the deposition of 0.01 joule of energy per kilogram of absorbing material. The rem is the unit that measures the absorbed dose and the relative effectiveness of the type of ionizing radiation in damaging biological systems. One rem of one type of radiation has the same biological effects as 1 rem of any other kind of radiation. This allows comparison of the biological effects of radionuclides that emit different types of radiation. The term used for reporting the collective dose (i.e., the sum of individual doses received in a given time period) by a specified population from radiation exposure to a radiation source is person-rem. For example, if 100 workers received 0.1 rem each, the collective dose would be 10 person-rem (100 people x 0.1 rem).

The average American receives a total of approximately 620 millirem (mrem) per year from natural and man-made radiation sources. Approximately 310 mrem per year are from radiation exposure to natural sources (background). The largest natural sources are radon-222 and its radioactive decay products in homes and buildings, which contribute about 230 mrem per year. Additional natural sources include radioactive material in the earth (primarily the uranium and thorium decay series, and potassium-40) and cosmic rays from space filtered through the atmosphere. Approximately 310 mrem per year are from man-made radiation sources. Man-made radiation exposure is mostly from medical procedures such as computed tomography (CT) scans and nuclear medicine which contribute approximately 300 mrem per year to the dose of an average American (NCRP, 2009).

E.2.4 Radiation Dose Definitions

In quantifying the effects of radiation on humans, other terms are used to describe the dose from exposure to radiation. For consistency, this Appendix uses terminology consistent with International Commission on Radiological Protection (ICRP) Publication 60 (ICRP, 1991). A list of the terminology used

in ICRP Publication 60 (ICRP, 1991) and the terminology used in earlier guidance is shown in Table E-1. Although the terminology has changed, the usage is unchanged.

Table E-1: Radiation Dose Terminology

ICRP 60 Terminology	*Previous Terminology*
Tissue Weighting Factor	Weighting Factor
Effective Dose Effective	Dose Equivalent
Committed Effective Dose	Committed Effective Dose Equivalent
Total Effective Dose	Total Effective Dose Equivalent

Tissue weighting factors are used for various body organs and tissues to account for that individual organ's or tissue's proportion of risk versus the total risk when the whole body is irradiated uniformly. Organ doses are calculated for individual organs such as the lungs, stomach, small intestine, upper large intestine, lower large intestine, bone surface, red bone marrow, testes, ovaries, muscle, thyroid, bladder, kidneys, and liver. The summation of each specific organ dose, weighted by the relative risk to that organ compared to an equivalent whole-body radiation exposure, is a whole body dose. To determine the overall effect from reactor plant disposal, whole body doses are presented in this Appendix.

A whole body dose from external radiation is called the effective dose (ED). The ED occurs instantaneously during the period when the body is exposed to direct radiation from an external radiation field. The estimated whole body dose over a lifetime from a single uptake of radioactive material is called the committed effective dose (CED). The CED is calculated over 50 years for adults and up to age 70 for children and accounts for radionuclides that have long half-lives and long residence times in the body. Total effective dose (TED) is the sum of the ED and CED. All estimates of dose presented in this Appendix, unless specifically noted otherwise, are TEDs quantified in terms of rem or mrem. A mrem is one one-thousandth of a rem.

The factors used to convert estimates of radionuclide intake (by inhalation or ingestion) or external radiation exposure to dose estimates are called dose conversion factors. The ICRP and federal agencies such as EPA publish these factors. The internal dose conversion factors used in this Appendix are based on recommendations made by the ICRP in 1990, published in 1991 (ICRP Publication 60 (ICRP, 1991)), and subsequent reports based on the 1990 recommendations (ICRP Publication 68 (ICRP, 1994)), ICRP Publication 71 (ICRP, 1995), and ICRP Publication 72 (ICRP, 1996)). The external dose conversion factors for dose from external, direct radiation are based on earlier ICRP and EPA Guidance (ICRP Publication 26 (ICRP, 1977), (EPA, 1993)).

E.2.5 Radiation Exposure Limits

As discussed above, the body can be exposed to radioactivity through external exposure to radiation. Radioactivity can also get inside the body through air, water, or food and through surface contamination via the mouth, skin, or a wound. The Federal limit for radiation exposure is 5 rem per year. The EPA annual dose limit for airborne radioactivity is 10 mrem (40 Code of Federal Regulations Part 61.102). The EPA Drinking water limits (40 Code of Federal Regulations Parts 8, 141, and 142) are combined radium

226/228 of 5 picoCuries per liter of water; a gross alpha standard for all alphas of 15 picoCuries per liter of water (not including radon and uranium); 4 mrem/year for beta emitters; and 30 micrograms per liter for uranium. NNPP, DOE, and Nuclear Regulatory Commission (NRC) radiation exposure limits meet or exceed applicable Federal and EPA external and internal radiation exposure limits.

E.2.6 Evaluation of Health Effects From Radiation Exposure

Radiation interacts directly and indirectly with the atoms that form cells. In a direct action, the radiation interacts directly with the atoms of the deoxyribonucleic acid (DNA) molecule or some other component critical to the survival of the cell. Since the DNA molecules make up a small part of the cell, the probability of direct action is small. Because most of the cell is made up of water, there is a much higher probability that radiation would interact with water. In an indirect action, radiation interacts with water and breaks the bonds that hold water molecules together, producing reactive free radicals that are chemically toxic and destroy the cell. The body has mechanisms to repair damage caused by radiation.

Consequently, the biological effects of radiation on living cells may result in one of three outcomes: (1) injured or damaged cells repair themselves, resulting in no residual damage; (2) cells die, much like millions of body cells do every day, being replaced through normal biological processes and causing no health effects; or (3) cells incorrectly repair themselves, which results in damaging or changing the DNA of the irradiated cell. Stochastic effects, that is, effects that may or may not occur based on chance, may occur when an irradiated cell is incorrectly repaired rather than killed. The most significant stochastic effect of radiation exposure is that an incorrectly repaired cell may, after a prolonged delay, develop into a cancer cell (NRC, 2011).

Detrimental health effects are calculated based on the radiation exposure dose results to an individual or population group. The dose-to-health effect conversion factors used for calculations of health effects are taken from ICRP Publication 103 (ICRP, 2007). Health effects from radiation exposure are used to summarize and compare results in this Appendix. Cancer is reported because cancer is the principal potential health detriment which may result from low-level radiation exposure.

In determining a means of assessing health effects from radiation exposure, the ICRP has developed detriment-adjusted factors which include both fatal and non-fatal cancers. The ICRP adjusts the incidence of non-fatal cancers upward to account for the total harm experienced as a consequence of developing the cancer. The cancer factors overstate the expected incidence of fatal cancer in the population and the use of these factors to estimate the incidence of fatal cancer is conservative for comparison.

E.2.7 Studies of the Effects of Radiation on Human Beings

Observations on the biological effects of ionizing radiation began soon after the discovery of x-rays in 1895 (NAS-NRC, 2006). Numerous references are made in the early literature to the potential biological effects of exposure to ionizing radiation. These effects have been intensely investigated for many years (Upton, 1982). Although there still exists some uncertainty about the exact level of risk, the National Academy of Sciences has stated in NAS-NRC (1980):

> "It is fair to say that we have more scientific evidence on the hazards of ionizing radiation than on most, if not all, other environmental agents that affect the general public."

A large amount of experimental evidence of radiation effects on living systems has come from laboratory studies on cell systems and on animals. However, what sets our extensive knowledge of radiation effects on human beings apart from other hazards is the evidence that has been obtained from studies of human populations that have been exposed to radiation in various ways (NAS-NRC, 1980). The health effects demonstrated from studies of people exposed to high doses of radiation (that is, significantly higher than current occupational limits) include cancer, cataracts, sterility, and developmental abnormalities (from prenatal exposure). Results from animal studies indicate the potential for genetic effects, although none have been observed in human beings (NAS-NRC, 2006).

E.2.7.1 High Dose Studies

The human study populations that have contributed a large amount of information about the biological effects of radiation exposure include the survivors of the atomic bombings of Hiroshima and Nagasaki, Japan, x-rayed tuberculosis patients, victims of various radiation accidents, patients who have received radiation treatment for a variety of diseases, radium dial painters, and inhabitants of South Pacific islands that received unexpected doses from fallout due to early nuclear weapons tests. All of these populations received high or very high exposures.

The studies of atomic bomb survivors have provided the single most important source of information on the immediate and delayed effects of whole body exposure to ionizing radiation. The studies have been supported for over 50 years by the U.S. and Japanese governments and include analysis of the health of approximately 105,000 survivors of the bombings. Continued follow-up of the Japanese survivors has changed the emphasis of concern from genetic effects to the induction of cancer (NAS-NRC, 2006; UNSCEAR, 2006).

The induction of cancer has been the major latent effect of radiation exposure in the atomic bomb survivors. The tissues most sensitive to the induction of cancer appear to be the blood-forming organs, the thyroid, and the female breast. Other cancers linked to radiation, but with a lower induction rate, include cancers of the lung, stomach, colon, bladder, liver, and ovary. A wave-like pattern of leukemia induction was seen over time beginning about 2 years after exposure, peaking within 10 years of exposure, and generally diminishing to near baseline levels over the next 40 years. For other cancers, a statistically significant excess was observed 5 years or more after exposure, and the excess risk continues to rise slowly with time (United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR, 2006).

While it is often stated that radiation causes all forms of cancer, many forms of cancer actually show no statistically significant increase among atomic bomb survivors. These cancers include chronic lymphocytic leukemia, multiple myeloma, Hodgkin lymphoma, and cancers of the rectum, pancreas, uterus, prostate, cervix, and kidney (Hsu et al., 2013; NAS-NRC, 2006; Ozasa et al., 2009; UNSCEAR, 2006).

To understand the impact of cancer induction from the atomic bombings in 1945, it is necessary to compare the number of radiation-related cancers to the total number of cancers expected in the exposed group. As of 1998, studies of approximately 105,000 survivors identified 17,448 cases (i.e., incidences) of solid cancer (cancers other than malignancies of the blood or blood-forming organs), of which an estimated 853 were in excess of expectation (Preston et al., 2007). As of December 2003, studies of over 86,000 survivors from the same population find that there have been 10,929 solid cancer deaths and of these, an estimated 527 solid cancer deaths are in excess of expectation (Ozasa et al., 2009). An updated analysis of the same population of approximately 105,000 survivors through 2009

found 22,538 cases of solid cancers, of which an estimated 992 were in excess of expectation (Grant et al., 2017). In that same population, as of December 2000 there were 310 leukemia deaths of which an estimated 103 deaths are in excess of expectation (Richardson et al., 2009). These studies did not reveal a statistically significant excess of cancer below doses of 6 Rem (UNSCEAR, 2000). The cancer mortality experience of the other human study populations exposed to high doses (referenced above) is generally consistent with the experience of the Japanese atomic bomb survivors (NAS-NRC, 2006; UNSCEAR, 2006).

About 40 years ago, the major concern of the effects from radiation exposure centered on possible genetic changes (i.e., possible effects from radiation exposure to reproductive cells prior to conception of a child). Ionizing radiation was known to cause such changes in many species of plants and animals. However, intense study of nearly 70,000 offspring of atomic bomb survivors has failed to identify any increase in genetic effects. Based on a recent analysis, human beings now appear less sensitive to the genetic effects from radiation exposure than previously thought, and at low doses the genetic risks are small compared to the baseline risks of genetic disease (NAS-NRC, 2006).

Radiation-induced cataracts have been observed in atomic bomb survivors and persons receiving high radiation doses to the eye. In 1990, the National Academy of Sciences stated the threshold for a vision-impairing cataract under conditions of protracted exposure was thought to be no less than 800 rem, which greatly exceeds the amount of radiation that can be accumulated by the lens through occupational exposure to radiation under normal working conditions (NAS-NRC, 1990). Additional epidemiological evidence evaluated by the International Commission on Radiological Protection and the National Council on Radiation Protection and Measurements since the publication of NAS-NRC (1990) suggests that the threshold dose for formation of vision-impairing cataracts may be lower than previously considered (ICRP, 2012; NCRP, 2018). The International Commission on Radiological Protection has stated that unless the exposure to the eye exceeds 50 Rem, vision-impairing cataracts should not form (ICRP, 2012). The National Council on Radiation Protection and Measurements has stated that the limitations and uncertainties of available data make it difficult to estimate the threshold dose for radiation-induced effects on the lens of the eye, but the preponderance of the evidence indicates the threshold is in the range of 100-200 Rem (NCRP, 2016). These estimates of the threshold dose for cataract formation exceed the amount of radiation that should be accumulated by the lens of the eye for occupational exposure to radiation under normal working conditions for all alternatives evaluated in this EIS/OEIS.

Radiation damage to the reproductive cells at very high doses can result in sterility. Impairment of fertility requires a dose large enough to damage or deplete most of the reproductive cells and is close to a lethal dose if exposure is to the whole body. The National Academy of Sciences estimates the threshold dose necessary to induce permanent sterility is approximately 350 Rem in a single dose (NAS-NRC, 1990). This dose far exceeds that which can be received from occupational exposure under normal working conditions.

Among the atomic bomb survivors' children who received high prenatal exposure (that is, their mothers were pregnant at the time of the exposure), developmental abnormalities were observed. These abnormalities included stunted growth, small head size, and mental retardation. Additionally, analysis suggests that during a certain stage of development (the 8th to 15th week of pregnancy), the developing brain appears to be especially sensitive to radiation. A slight lowering of intelligence quotient (IQ) might follow even relatively low doses of 10 Rem or more (NAS-NRC, 1990).

From this discussion of the health effects observed in studies of human populations exposed to high doses of radiation, it can be seen that the most important of the effects from the standpoint of occupationally exposed workers is the potential for induction of cancer (NAS-NRC, 2006).

E.2.7.2 Low Dose Studies

The cancer-causing effects of radiation on the bone marrow, female breast, thyroid, lung, stomach, and other organs reported for the atomic bomb survivors are similar to findings reported for other irradiated human populations. With few exceptions, however, the effects have been observed only at high doses and high dose rates. Studies of populations chronically exposed to low-level radiation have not shown consistent or conclusive evidence upon which to determine the risk of cancer (NAS-NRC, 2006). Attempts to observe increased cancer in human populations exposed to low doses of radiation have been difficult.

One problem in such studies is the number of people needed to provide sufficient statistics. As the dose to the exposed group decreases, the number of people needed to detect an increase in cancer goes up. For example, for a group exposed to 1 Rem (equivalent to the average lifetime accumulated dose in the NNPP), it would take more than 500,000 people in order to detect an excess in lung cancers (based on current estimates of the risk (Shore, 1990)). This is almost two times the number of people who have performed radiological work in all the naval shipyards over the last 65 years. Another limiting factor is the relatively short time since low-dose occupational exposure started being received by large groups of people. As discussed previously, data from the atomic bomb survivors indicate a long latency period between the time of exposure and expression of the disease.

There is also the compounding factor that cancer is a generalization for a group of approximately 300 separate diseases, many of which are relatively rare and have different apparent causes. With low-dose study data, it is difficult to eliminate the possibility that some factor other than radiation may be causing an apparent increase in cancer induction. This difficulty is particularly apparent in studies of lung cancer, for example, where smoking is (a) such a common exposure, (b) poorly documented as to individual habits, and (c) by far the primary cause of lung cancer. Because cancer induction is statistical in nature, low-dose studies are limited by the fact that an apparent observed small increase in a cancer may be due to chance alone.

Despite the above-mentioned problems and the lack of consistent or conclusive evidence from such studies to date, low-dose studies fulfill an important function. They are the only means available for eventually testing the validity of current risk estimates derived from data accumulated at higher doses and higher dose rates.

Low-dose groups that have been, and are currently being, studied include groups exposed as a result of medical procedures; exposed to fallout from nuclear weapons testing; living near U.S. commercial nuclear installations; living in areas of high natural background radiation; and occupational exposure to low doses of radiation. The National Academy of Sciences has reviewed a number of the low-dose studies in NAS-NRC (1990) and NAS-NRC (1980). Their overall conclusion from reviewing these studies was:

> "Studies of populations chronically exposed to low-level radiation, such as those residing in regions of elevated natural background radiation, have not shown consistent or conclusive evidence of an associated increase in the risk of cancer (NAS-NRC, 1990)."

This conclusion has been supported by studies that have been completed since NAS-NRC (1990) was published and reviewed by the National Academy of Sciences (NAS-NRC, 2006). For example, in 1990 the National Cancer Institute completed a study of cancer in U.S. populations living near 62 nuclear facilities that had been in operation prior to 1982. This study included commercial nuclear power plants and Department of Energy facilities that handle radioactive materials. The National Cancer Institute study concluded that there was no evidence that leukemia or any other form of cancer was generally higher in the counties near the nuclear facilities than in the counties remote from nuclear facilities (National Cancer Institute, 1990). At the request of the Three Mile Island Public Health Fund, independent researchers investigated whether the pattern of cancer in the 10-mile area surrounding the Three Mile Island nuclear plant had changed after the TMI-2 accident in March 1979 and, if so, whether the change was related to radiation releases from the plant. A conclusion of this study was:

> "For accident emissions, the authors failed to find definite effects of exposure on the cancer types and population subgroups thought to be most susceptible to radiation. No associations were seen for leukemia in adults or for childhood cancers as a group." (Hatch et al., 1990)

Of particular interest to workers in the NNPP are studies of groups occupationally exposed to radiation. As of 2018, there were about 800,000 radiation workers under study in the United States (Boice Jr. et al., 2019). For several decades, NNPP personnel, including those at shipyards and in the Fleet, have been included among populations being studied. These studies are discussed below.

In 1978, Congress directed the National Institute for Occupational Safety and Health (NIOSH) to perform a study of workers at Portsmouth Naval Shipyard (PNSY). Congress also chartered an independent oversight committee of nine national experts to oversee the performance of the NIOSH study in order to ensure technical adequacy and independence of the results. The following is a NIOSH summary of the study and their results. This summary was prepared by NIOSH at the conclusion of their study phase in February 1986.

> In December 1980, NIOSH researchers completed the first report on a detailed study of the mortality among employees of the shipyard. Included in the study were all those who had been employed at Portsmouth Naval Shipyard since January 1, 1952 (the earliest date that records existed that could identify former employees). In this report it was concluded that "Excesses of deaths due to malignant neoplasms and specifically due to neoplasms of the blood and blood-forming tissue, were not evident in civilian workers at Portsmouth Naval Shipyard..." in contrast to the results of the original study conducted by the physician. Later, in an investigation to determine why the physician's study results differed so greatly from the NIOSH study, a number of shortcomings in his original study were found that resulted in incorrect conclusions.
>
> To make more certain that workers who had died from leukemia did not die because of radiation exposures received at the shipyard, a second study was conducted. That study compared the work and radiation histories of persons who died of leukemia, with persons who did not. In this analysis, again, no relationship was found between leukemia and radiation, although the NIOSH researchers were unable to rule out the possibility of other occupational exposures having a role.

> In this current and third NIOSH paper, we investigated the role that radiation and other occupational exposures at the shipyard may have had in the development of lung cancer. This study is an outgrowth of an observation made in the 1980 NIOSH study referred to above. The observation was that persons with greater than 1 Rem cumulative exposure to radiation had an increase in lung cancer.
>
> In this report entitled, "Case Control Study of Lung Cancer in Civilian Employees at the Portsmouth Naval Shipyard," we compared the work and radiation histories of persons who died of lung cancer with persons who did not. We found that persons with radiation exposures in excess of 1 Rem had an excess risk of dying of lung cancer, but the radiation was in all likelihood not the cause. This was due to the fact that persons with radiation exposure tended also to have exposure to asbestos (a known lung carcinogen) and to welding by-products (suspected to contain lung carcinogens).

The NIOSH studies were published in the scientific literature in (Greenberg et al., 1985; Rinsky et al., 1988; Rinsky et al., 1981; Stern et al., 1986).

NIOSH published the results of an update to the 1980 study in the July 2004 edition of the Journal of Occupational and Environmental Medicine (Silver et al., 2004). The cohort was expanded by including all PNSY workers employed through 1992 and included worker vital statistics up to December 31, 1996. The NIOSH study found nothing to conclude that the health of shipyard workers has been adversely affected by low levels of occupational radiation exposure incidental to work on nuclear-powered ships. These findings are generally consistent with previous studies.

The study showed no statistically significant cancer risks linked to radiation exposure, when compared to the general U.S. population. Further, the overall death rate among PNSY occupational radiation workers was less than the death rate for the general U.S. population. Other key conclusions reached in the study include the following:

> The study found a slightly higher death rate for all types of cancer in personnel who were never radiation workers, when compared to the general U.S. population. Although not statistically significant, the study also found an equivalent slightly higher death rate for all types of cancer for those who received occupational radiation exposure when compared to the general U.S. population. Fewer deaths than expected were observed for tuberculosis, diseases of the heart, circulatory system, and digestive system, as well as for accidents and violence.
>
> Consistent with the 1981 NIOSH study, the current study did not find a statistically significant difference in the death rates from leukemia for shipyard personnel and the general U.S. population. Although NIOSH concludes that the result is not statistically significant, the data suggest the potential for a small increase in the low risk of leukemia for workers receiving occupational radiation exposure. The small number of leukemia cases (34 out of 11,791 workers receiving occupational radiation exposure) reflects the low risk of this disease. The researchers considered this potential relationship of radiation exposure and leukemia to be considerably uncertain and to require additional study before any conclusions can be made.

The study found a slightly higher death rate for lung cancer for workers that were never radiation workers, when compared to the general U.S. population. The study found a slightly higher death rate for lung cancer for workers receiving occupational radiation exposure, when compared to the general U.S. population. The researchers concluded that the slightly higher rates were accounted for by factors other than radiation exposure; the other factors were smoking, exposure to welding fumes, and asbestos work during the early years covered by the study when the hazards associated with asbestos were not so well understood as they are today.

Several additional analyses using the PNSY data have been performed by NIOSH and reports of the results published.

In the December 2005 issue of Radiation Research (Kubale et al., 2005) NIOSH published the results of a case-control study of leukemia mortality and ionizing radiation. The study found that although the overall risk of leukemia mortality for radiation workers was the same as the general population, a small increase in risk was noted with increasing radiation dose. NIOSH estimated that the lifetime risk for leukemia mortality would increase from 0.33% to 0.36% for workers receiving the average lifetime radiation dose for shipyard workers (1 Rem). The study also found a small increase in leukemia mortality associated with potential solvent exposure (benzene or carbon tetrachloride). NIOSH cautioned that the relatively small number of leukemia cases among radiation workers (34 cases in a population of 11,791 workers) makes it difficult to be certain of the findings. However, the risk estimate is consistent with other radiation epidemiologic study results.

The results of a much larger case-control study of leukemia mortality (excluding chronic lymphocytic leukemia [CLL]) and ionizing radiation were published in the February 2007 issue of Radiation Research (Schubauer-Berigan et al., 2007b) by NIOSH. The study included workers at four Department of Energy (DOE) facilities and PNSY. NIOSH did not find a statistically significant risk associated with occupational radiation exposure, although the results suggest the potential for a small increase in the low risk of leukemia (approximately five times less risk than the smaller 2005 case-control study of only PNSY workers discussed above). NIOSH stated that the risk estimates are consistent with the results of other studies of nuclear workers and high dose populations.

NIOSH reported the results of a lung cancer case-control study of PNSY workers in the September 2007 issue of Radiation Research (Yiin et al., 2007). In addition to occupational radiation exposure, the data analysis considered the effects of asbestos and welding fumes (confounders) on the lung cancer risk. The study found a slight non-statistically significant increase in lung cancer risk with increasing radiation exposure but the risk diminished when all confounders were considered.

In the December 2007 issue of the British Journal of Haematology (Schubauer-Berigan et al., 2007a) NIOSH published the results of a case-control study of CLL mortality and ionizing radiation. Workers at four Department of Energy (DOE) facilities and PNSY were included in the study. The results of the study, which is one

the largest studies to specifically evaluate the risk of CLL among nuclear workers, did not find a consistent association between radiation and CLL.

In the June 2015 issue of Radiation Research (Schubauer-Berigan et al., 2015), NIOSH reported the results of a pooled cohort study of PNSY and four DOE facilities. The study found a slight non-statistically significant increase in solid cancer risk and leukemia risk. The study also found a small statistically significant increase in multiple myeloma risk; the lifetime risk for multiple myeloma mortality (Howlader, 2019) would increase from 0.42% to 0.44% for workers receiving the average lifetime radiation dose for shipyard workers (1 Rem). However, the finding was based on a relatively small number of cases, included a high degree of statistical uncertainty, and is not consistent with studies of other populations exposed to ionizing radiation (e.g., Japanese atomic bomb survivors). Overall, the risk of death from multiple myeloma in the study population was less than that of the United States population in general. Data from PNSY was also included in a similar study of radiation workers from three nations (the United States, United Kingdom, and France)—the International Nuclear Workers, or INWORKS, study. The INWORKS study group found no evidence of a statistically significant increase in solid cancer risk among occupationally exposed workers (D. B. Richardson, 2015) and a small, statistically significant increase in the risk of leukemia (excluding CLL) consistent with leukemia risk estimates from studies of Japanese atomic bomb survivors (K. Leuraud, 2015).

In 1991, researchers from Johns Hopkins University, Baltimore, Maryland, completed a more comprehensive epidemiological study of the health of workers at the six naval shipyards (including PNSY, discussed above) and two private shipyards that serviced U.S. naval nuclear-powered ships (Matanoski, 1991; Matanoski et al., 2008). This independent study evaluated a population of 70,730 civilian workers over a period from 1957 (beginning with the first overhaul of the first nuclear-powered submarine, ex-Nautilus) through 1981, to determine whether there was an excess risk of leukemia or other cancers associated with exposure to low levels of gamma radiation.

This study did not show any cancer risks linked to radiation exposure. Furthermore, the overall death rate among radiation-exposed shipyard workers was actually less than the death rate for the general U.S. population. It is well recognized that many worker populations have lower mortality rates than the general population: the workers have to be healthy to do their jobs. This study shows that the radiation-exposed shipyard population falls into this category.

The death rate for cancer and leukemia among the radiation-exposed workers was slightly lower than that for non-radiation-exposed workers and that for the general U.S. population. However, an increased rate of mesothelioma, a type of respiratory system cancer linked to asbestos exposure, was found in both radiation-exposed and non-radiation-exposed shipyard workers, although the number of cases was small (reflecting the rarity of this disease in the general population). The researchers suspect that shipyard worker exposure to asbestos in the early years of the Program, when the hazards associated with asbestos were not so well understood as they are today, might account for this increase.

The Johns Hopkins study found no evidence to conclude that the health of people involved in work on U.S. naval nuclear-powered ships has been adversely affected by exposure to low levels of radiation incidental to this work.

E.2.8 Transportation of Radioactive Material

Regulations for the transportation of radioactive material apply whether the material is transported from a Naval Shipyard or a commercial dismantling facility. Shipments of radioactive materials must be

made in accordance with applicable NRC, Department of Transportation (DOT) and DOE transportation regulations. The purpose of these regulations is to ensure that shipments of radioactive material are adequately controlled to protect the environment and the health and safety of the general public. These regulations apply to all radioactive material shipments and provide requirements for container design, certification, and identification pertaining to the specific quantity, type, and form of radioactivity being shipped.

In addition to the above, requirements for certain naval shipping container designs incorporate shielding and integrity specifications. These requirements provide for container design analysis, training and qualification of workers who construct containers, and quality control inspections during fabrication to ensure the containers will meet design requirements.

Protective transportation services, such as signature security service or sealed shipping vehicles, are required for radioactive material shipments to ensure point-to-point control and traceability of each shipment from shipper to receiver. A readily accessible log of all shipments in transit is maintained to enable prompt identification and provide the basis for advice on the nature of the shipment. Receivers must make return receipts in writing to ensure that radioactive material has not been lost in shipment. Inspection of containers of radioactive material and accompanying documents is required promptly after receipt. Receivers must report even minor discrepancies from detailed shipping regulations to the shipper, so that correction can be made in future shipments. This is done to ensure compliance with shipping regulations.

Radioactive materials shipped include anticontamination clothing, small sealed sources used for calibrating radiation monitoring instruments, tools and equipment used for radioactive work, low-level radioactive waste, radioactive components, and new and spent naval fuel. Each year, nearly 3 million shipments of radioactive materials are made annually in the United States (American Nuclear Society, 2002).

In the NNPP, most radioactive shipments contain only low-level radioactivity and are classified under DOT regulations as low specific activity, surface contaminated objects, or excepted package shipments. The predominant radionuclide associated with most of these shipments is cobalt-60 in the form of insoluble metallic oxide corrosion products attached to surfaces of materials inside shipping containers.

About two-thirds of the low-level shipments are anticontamination clothing, equipment, tools, and routine waste. The anticontamination clothing is special outer clothing that becomes potentially contaminated with low levels of radioactivity while worn in controlled work areas. About one-fifth of the low-level shipments are environmental and chemistry samples en route to analytical laboratories. Less than one-tenth of the low-level radioactivity shipments are minute quantities in sealed instrument calibration check sources. These sources contain insignificant quantities of radioactivity, comparable to the radioactivity in typical household smoke detectors.

Estimates of annual radiation exposure to transportation crews and the general public from shipments of radioactive materials in the NNPP have been made in a manner consistent with that employed by the NRC in NRC (1977). Based on comparisons of the types and numbers of radioactive shipments made, the total annual radiation exposure to all transportation crews for all shipments is estimated to be approximately 3 person-rem. If one person were to receive all this exposure, that person would not exceed the annual radiation exposure permitted for an individual worker by the NRC. The total estimated radiation exposure accumulated by the public along transportation routes is 10 person-rem. The maximum exposure received by any individual member of the public from transportation of

radioactive material would be far less than the exposure that individual would receive from natural sources of radiation such as rocks, soil, and the sun.

Shipments of radioactive materials associated with naval nuclear propulsion plants have not resulted in any measurable release of radioactivity to the environment.

NNPP, NRC, and DOT requires that the carriers for all radioactive material shipments have accident plans identifying the actions to be taken in case the transportation vehicle is involved in an accident. These plans provide for notification of civil authorities and the originating facility. These plans also provide a 24-hour telephone number for emergency guidance and assistance.

E.2.9 Perspective on Calculations of Cancer and Risk

The topics of human health effects caused by radiation and the risks associated with reactor plant disposal are discussed throughout this EIS/OEIS. It is important to understand these concepts and how they are used to understand the information presented in this document. It is also valuable to have some frame of reference or comparison for understanding how the risks compare to the risks of daily life.

The method used to calculate the risk of any impact is fundamental to all of the evaluations presented and follows standard accepted practices. The first step is to determine the probability that a specific event would occur. For example, the probability that a routine task, such as operating a crane, would be performed sometime during a year of reactor plant disposal at a facility would be 1.0. Which means that the action would certainly occur. The probability that an accident would occur is less than 1.0. Accidents occur only occasionally and some of the more severe accidents, such as a catastrophic earthquake, might occur at any location only once in hundreds, thousands, or millions of years.

Once the probability of an event has been determined, the next step is to predict the consequences of the event being considered. One important measure of consequences chosen for this EIS/OEIS is cancer induced by radiation. The cancer that might be caused by reactor plant disposal can be calculated using a standard technique based on the amount of radiation exposure estimated to occur from all conceivable pathways and the number of people who could be affected.

For example, the lifetime risk of dying in a motor vehicle accident can be calculated from the likelihood of an individual being in an accident and the consequences, or number of fatalities, per accident. There were 474,549 motor vehicle accidents during 2020 in the state of Texas resulting in 3,896 deaths (Texas Department of Transportation, 2020). Assuming only one person is involved in each accident, the probability of a person in Texas being in a motor vehicle accident is 474,549 accidents divided by 29,527,941 persons in Texas (U.S. Census Bureau, 2021), or 0.016 per year. The probability of an accident causing a fatality is 0.0082 (3,896 deaths divided by 474,549 accidents). Multiplying the probability of the accident (0.016 per year) by the consequences of the accident (0.0082 deaths per accident) by the number of years the person is exposed to the risk (78.5 years is considered to be an average lifetime) (CDC, 2012)[1] gives the lifetime risk for any individual of being killed in a motor vehicle accident. From this calculation, the lifetime risk of an individual dying in a motor vehicle accident in Texas is about 0.010 or 1 percent.

Table E-2 presents the risks associated with occupational radiation exposure for the alternatives analyzed in this EIS/OEIS and other commonplace lifetime and occupational risks.

[1] CDC is an acronym for the Center for Disease Control and Prevention

Table E-2: Commonplace Lifetime and Occupational Risks

Occupational or Commonplace Fatality Risk	*Lifetime Risk Percent*
Cancer, All Causes[1]	19
Tobacco[2]	9.7
Accidents (all)[3]	4.0
Agriculture, Forestry, and Fishing[4]	1.0
Transportation and Warehousing[4]	0.6
Cancer: Alternatives 1, 2, and 3 (risk estimate)[5]	<0.3

[1](National Cancer Institute, 2021)
[2](CDC, 2011)
[3](National Center for Health Statistics, 2021)
[4](U.S. Department of Labor & U.S. Bureau of Labor Statistics, 2022)
[5]Alternative 3 (Preferred Alternative) is bounding of all action alternatives, and was conservatively calculated by multiplying a maximum of 2 rem/year typically received by 99% of the NRC occupationally exposed workforce (NRC, 2018) by the 3-year duration of radiological work and the ICRP conversion factor for workers (consistent with NNPP report NT-21-2, May 2021). Lifetime risk percent associated with occupational radiation exposure for the No Action Alternative is negligible.

E.3 Analysis of Uncertainties

The analyses of the impacts of reactor plant disposal presented in this EIS/OEIS are based on conservative calculations. This is necessary as a release of radioactivity to the environment has a low probability of occurrence and most of the impacts of reactor plant disposal operations are so small that they cannot be measured.

E.3.1 Conversion of Radiation Exposure to Health Effects

The conversion of amounts of radiation or radioactive material transmitted to an individual or to population groups into health effects requires the calculation of the radiation exposure or dose received by humans caused by exposure to a radiation field. Such calculations are based on a number of factors. The factors include the type of radiation involved, the sensitivity of various organs, and the age of the individuals involved. The energies, half-lives, and similar properties of radioactive material or radiation have been measured extensively and introduce little uncertainty into the calculations in this EIS/OEIS.

The numerical estimates of fatal cancer and other health effects are obtained by the practice of modeling a linear-non-threshold (LNT) dose-response relationship for the induction of fatal cancer. The LNT model assumes that the health effects from radiation increase proportionally with dose, that the effects from high doses can be extrapolated to determine the effects at low doses, and that a threshold does not exist below which no health effects occur.

However, the number of detrimental health effects which might result from exposure of a large group of people to low levels of radiation has been the subject of debate for many years and no scientific knowledge exists to confirm a quantitative model. The ICRP stated the following in its 2007 recommendations (ICRP, 2007):

> "Although there are recognised [sic] exceptions, for the purposes of radiological protection the Commission judges that the weight of evidence on fundamental cellular processes coupled with dose-response data supports the view that, in the low dose range, below about 100 mSv [10 rem], it is scientifically plausible to assume that the incidence of cancer or heritable effects will rise in direct proportion to an increase in the equivalent dose in the relevant organs and tissues…However, the Commission emphasises [sic] that whilst the LNT model remains a scientifically plausible element in its practical system of radiological protection, biological/epidemiological information that would unambiguously verify the hypothesis that underpins the model is unlikely to be forthcoming."

There is much uncertainty in the understanding of dose to health effects because the data are inconclusive at small doses, and other methods of extrapolation to the low-dose region could yield higher or lower numerical estimates of cancer. Studies of human populations exposed at low doses have not shown consistent or conclusive evidence upon which to determine the incidence of cancer from radiation exposure. Attempts to observe increased cancer in human populations exposed to low doses of radiation have been difficult. There is scientific uncertainty about cancer incidence in the low-dose region below the range of epidemiologic observation (observations having to do with the branch of medicine that studies events that affect many people throughout an area at the same time), and the possibility of no incidence cannot be excluded. The reason low-dose studies cannot be conclusive is that the incidence rate, if it exists at these low levels, is too small to be seen in the presence of all the other risks of life (NNPP, 2011). However, the NNPP has always assumed that radiation exposure, no matter how small, may involve some consequence (e.g., cancer). For this Appendix, the recommendations from the ICRP (ICRP, 2007) based on the LNT model are used to evaluate health effects.

The calculations of health effects performed in this EIS/OEIS use the relation recommended by the ICRP because it is well documented and kept up to date by the ICRP. It is also consistent with the preferred model identified by the National Academy of Sciences in the BEIR VII report (NAS-NRC, 2006), the United Nations Scientific Committee (UNSCEAR, 2000) and the National Council on Radiation Protection (NCRP, 2001) and is widely accepted by the scientific community as representing a method which produces estimates of health effects which would not be exceeded. However, a number of researchers believe that the ICRP relation overestimates the number of detrimental health effects produced by low levels of radiation and, in fact, the possibility of no effect cannot be excluded. Conversely, there are some who believe that exposure to low levels of radiation can produce more health effects than would be estimated using the ICRP relations.

Clearly, using a relationship developed by one or the other of these groups would produce a larger or smaller estimate of the number of health effects than the values presented in this EIS/OEIS, but a factor of two change in the small risks calculated for all of the alternatives would still leave them as small risks. All of the results of analyses of reactor plant disposal in this EIS/OEIS include the calculated radiation exposure in addition to the number of health effects to enable independent calculations using any relation between radiation exposure and health effects judged appropriate.

The radiation exposures reported in this EIS/OEIS are chronic radiation exposures based on the committed dose (50 or more years of internal dose delivery) from an annual dose from reactor plant disposal.

The increased number of fatal cancers is based on the calculated increase in exposure to radiation that would be seen by the general public. The average annual dose received by a member of the population of the United States from background radiation is approximately 310 mrem. When people are exposed to additional radiation, the number of radiation-induced cancer and other health effects increase. In a typical group of 10,000 persons who do not work with radioactive material, a total of about 2,000 (20 percent) will normally die of cancer. If each of the 10,000 persons received an additional 1 rem of radiation exposure (10,000 person-rem) in their lifetime, then an estimated 5 additional cancer deaths (0.05 percent) might occur. Therefore, the likelihood of a person contracting fatal cancer during their lifetime could be increased nominally from 20 percent to 20.05 percent by receiving a dose of 1 additional rem of radiation. The factor used in this EIS/OEIS to obtain fatal cancers is 0.00041 fatal cancers per person-rem for workers and 0.00055 fatal cancers per person-rem for the general public (ICRP, 2007). The conversion factor for the general public is slightly higher than that for workers because the general public includes infants and children, who are more susceptible to the development of cancer over the course of their life. The cancer health conversion factors overstate the expected incidence of fatal cancer in the population, and the use of these factors to estimate the incidence of fatal cancer is conservative.

E.3.2 Summary of Uncertainties

As discussed in the preceding portions of this section, the calculations in this EIS/OEIS have generally been performed in such a way that the estimates of annual risk provided are unlikely to be exceeded. For reactor plant disposal operations, monitoring of actual operations combined with projections for future operations provide realistic but conservative source terms, which, when combined with conservative estimates of the effects of radiation, produce estimates of risk which are very unlikely to be exceeded. The effects for all alternatives have been calculated using the same source terms and other factors, so this EIS/OEIS provides an appropriate means of comparing potential impacts on human health and the environment.

The use of conservative analyses is not a problem or disadvantage in this EIS/OEIS since all of the alternatives are evaluated using the same methods and data, allowing a fair comparison of all of the alternatives on the same basis. Furthermore, even using these conservative analytical methods, the annual risks for all of the alternatives are small, which greatly reduces the significance of any uncertainty analysis parameters.

E.4 Radiation Exposure Analysis for Alternatives Analyzed in this Environmental Impact Statement/Overseas Environmental Impact Statement

E.4.1 Occupational Radiation Exposure

For Alternatives 1 and 2 (the reactor compartment packaging alternatives), the estimated cumulative Shipyard occupational exposure to prepare the reactor compartment packages for disposal at the DOE Hanford Site (the reactor compartment packaging alternatives) is 300 rem over five years (potential risk of 0.12 additional latent cancer fatalities for workers, or approximately 0.025 additional latent cancer fatalities annually at 60 rem per year for a five-year project duration). For Alternative 3 (Preferred Alternative), the estimated cumulative occupational exposure to entirely dismantle the reactor plants is 540 rem over three years (potential risk of 0.22 additional latent cancer fatalities for workers, or approximately 0.074 additional latent cancer fatalities annually at 180 rem per year for a three-year project duration).

If Alternatives 1, 2, or 3 are not chosen, the No Action Alternative would occur by default. The disadvantage of this option is that it only delays ultimate permanent disposal. At the end of protective storage, the radioactive inventory (primary radionuclides such as nickel-63 and nickel-59) would still require permanent disposal of the reactor compartments as radioactive waste. The potential benefit would be lower radiation exposure to occupational workers. For example, a delay of 15 years would reduce the total radiation dose to shipyard workers such that the estimated cumulative Shipyard occupational exposure to prepare the reactor compartment packages for disposal at the DOE Hanford Site (the reactor compartment packaging alternatives) would be 37.5 rem over five years (potential risk of 0.015 additional latent cancer fatalities for workers, or approximately 0.003 additional latent cancer fatalities annually at 7.5 rem per year for a five-year project duration). With the 15-year delay, the estimated cumulative occupational exposure to entirely dismantle the reactor plants (Alternative 3 [Preferred Alternative]) would be 67.5 rem over three years (potential risk of 0.028 additional latent cancer fatalities for workers, or approximately 0.009 additional latent cancer fatalities annually at 22.5 rem per year for a three-year project duration). Deferral of Alternatives 1, 2, and 3 would not result in any significant reduction in radioactive waste volume. Deferral would require placement of ex-Enterprise in protected waterborne storage as described in the No Action Alternative at a substantial cost for storage and inflated future costs for disposal.

E.4.2 Transportation-Related Radiation Exposure

See Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants) for a detailed discussion of radiation exposure risks from transportation associated with the Preferred Action and alternatives.

E.5 Conclusions

The information presented in this Appendix demonstrates that occupational radiation exposure risk to individuals working within federal radiation limits to perform reactor plant dismantlement activities are small when compared to other hazards and commonplace lifetime risks.

A comparison of the No Action Alternative, the reactor compartment packaging alternatives, and the dismantlement (preferred) alternative is provided in Table ES-1 of the Executive Summary.

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Environmental Impact Statement/ Overseas Environmental Impact Statement

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants

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Appendix F Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants

F.1 Purpose

This appendix describes the analysis used to estimate radiation dose and associated health risks to the public and transportation crews from transportation of low-level radioactive waste associated with the Preferred Action and alternatives. The analysis considers transportation by rail, truck, and barge consistent with expected waste shipments for alternatives described in this Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS). The analysis produced conservative estimates of radiation exposures in normal conditions of transport (incident-free) and accident scenarios for each of the alternatives, as detailed below:

- No Action Alternative: No transportation analysis is necessary for the No Action Alternative. Low-level radioactive waste for the No Action Alternative would be very low volume and consistent with ongoing, routine nuclear shipyard work.
- Alternative 1: Transport of eight single ex-Enterprise naval reactor compartment disposal packages by barge from Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) to the Port of Benton, followed by transport by multiple-wheel, high-capacity transporter to the Department of Energy (DOE) Hanford Site near Richland, Washington.
- Alternative 2: Transport of four dual-reactor ex-Enterprise naval reactor compartment disposal packages by barge from PSNS & IMF to the Port of Benton, followed by transport by multiple-wheel, high-capacity transporter to the DOE Hanford Site near Richland, Washington.
- Alternative 3 (Preferred Alternative): Transport by barge, rail, or truck of 88 larger packages and about 352 container express (CONEX) boxes or similar-sized packages of low-level radioactive waste (e.g., piping, components) to one or more of the following low-level radioactive waste disposal facilities (EnergySolutions in Clive, Utah; the DOE Savannah River Site near Aiken, South Carolina; and Waste Control Specialists, LLC in Andrews, Texas).

F.2 Analysis Model

The computer code used for transportation analysis is Radioactive Material Transportation (RADTRAN). RADTRAN (Weiner et al., 2014) is considered the standard for radiological transportation analysis by DOE and the Nuclear Regulatory Commission. The program Web Transportation Routing Analysis Geographic Information System (WebTRAGIS) was used to perform the routing analysis to determine route length and population density.

The radiological health risks (i.e., increase in potential of cancer fatalities) from transport of radioactive waste generated for the Proposed Action and alternatives were analyzed for the general public, the transport crew, and hypothetical maximum exposed individuals (MEIs). Gamma radiation emanating directly from the shipment during normal transport conditions, as well as accident scenarios, were modeled. The accident scenario also models airborne release of radioactive material from a postulated severely damaged shipment.

The transportation analysis model requires defining the number of shipments and expected radiological dose rate on the exterior of those shipments; types of transportation used (such as barge, rail, and highway); and routes traveled. Normal conditions of transport and accident scenarios are analyzed.

Accident scenarios require estimating total activity for radionuclides included in the shipments. Finally, the locations and exposure durations for both members of the public and transportation crew are used to estimate cumulative exposure and exposure to MEIs. Details of these aspects of the model are presented below.

F.2.1 Number of Shipments and Estimated Radiation Dose Exterior to Packages

The estimated radiation dose rate on the exterior of each package containing low-level radioactive waste is defined as the Transportation Index (TI). TI is the highest radiation dose rate in mrem/hr expected to be measured at any location at 3.3 feet (ft.) from the shipment. TI values assigned are TI-2 (2 mrem/hr) for shipments with lower expected external radiation levels and TI-10 (10 mrem/hr) for shipments with higher expected external radiation levels. 10 mrem/hr is the maximum level allowed by Department of Transportation Regulations in 49 CFR Part 173, and therefore is considered bounding for the purposes of analysis.

- Alternative 1: Eight reactor compartment packages would be shipped to the DOE Hanford Site. Each package would consist of one reactor compartment for a total of eight shipments with transport index TI-2 for each shipment. For Alternatives 1 and 2 (the reactor compartment packaging alternatives), TI-2 is used as a conservative assumption based on measured radiation levels from past reactor compartment package shipments. For perspective, ex-Enterprise reactor compartment packages are expected to be less than 1 mrem/hr (TI-1) due to differences in internal activity and plant/package design as compared to past reactor compartment package shipments.
- Alternative 2: Four reactor compartment packages would be shipped to the DOE Hanford Site. Each package would consist of two reactor compartments, for a total of four shipments with transport index TI-2 for each shipment.
- Alternative 3 (Preferred Alternative): Alternative 3 was estimated to result in 440 packages for the eight ex-Enterprise naval reactor compartments. Of these 440 packages, TI-10 was applied to 96 packages and TI-2 was applied to 344 packages. Each reactor plant was assumed to consist of 55 total packages. These 55 packages would contain the same material as a single reactor compartment package as described for Alternative 1. TI-10 was applied for one CONEX box shipment per reactor plant, and TI-2 was applied for the remaining 43 CONEX box packages. TI-10 was applied to the additional 11 larger packages per reactor plant not suitable for CONEX box package. The TI difference in CONEX boxes was applied to provide a conservative result and provide flexibility in determining how packages are shipped within a bounding analysis.

F.2.2 Types of Shipments

Shipments by rail, ocean barge, river barge, and highway were modeled as appropriate for the alternative analyzed. For the reactor compartment packaging alternatives, the inland waters transit (including Puget Sound and lower Columbia River) was conservatively modeled as river barge transportation. The remaining transport from the Port of Benton to the DOE Hanford site was modeled as highway transportation. For Alternative 3 (Preferred Alternative), combinations of rail, ocean barge, river barge, and highway transportation were modeled to account for all possible transport routes. Land routes utilize interstate highways where possible and avoid secondary routes and tribal lands, and therefore may not represent the shortest drivable distance.

Table F-1 details the number of shipments, transportation index, and types of shipments for the alternatives analyzed.

Table F-1: Shipments

Mode	Shipment Type	MEI Estimate Assumptions	Total Number of Shipments (For Cumulative Estimates)	Package Size[1] (feet)	Transportation Index (mrem/hr)
Alternative 1		**Number of Reactor Compartments per Shipment**			
Reactor Compartment Package to the DOE Hanford Site	Single Reactor Compartment Package	1	8	39.8 W x 46.6 H x 35.5 L	2
Alternative 2		**Number of Reactor Compartments per Shipment**			
Reactor Compartment Package to the DOE Hanford Site	Dual Reactor Compartment Package	2	4	39.8 W x 46.6 H x 71.0 L	2
Alternative 3 (Preferred Alternative)		**55 Total Packages[2]**			
Commercial Dismantlement	Reactor Vessel	1	8	15 D x 21 L	10
Commercial Dismantlement	Other Large Reactor Plant Components	10	80	Max. 10 D x 25 L	10
Commercial Dismantlement	Remainder of Reactor Compartment in CONEX boxes	44	352	8 W x 8 H x 40 L	10 (8 boxes) 2 (344 boxes)

[1]Package sizes are those used for the analysis and are approximate.

[2]For Alternative 3 (Preferred Alternative), 55 packages contain the material for one reactor compartment.

Notes: D = Depth, H = Height, W = Width, L = Length, mrem = millirem (rem = Roentgen equivalent man), DOE = Department of Energy

F.2.3 Transportation Routes

Transportation routes for all waste shipments described in each of the proposed Alternatives are shown in Table F-2. The WebTRAGIS routing code provides population densities for segments along the transportation route and subdivides each of these into rural, suburban, and urban population density segments. WebTRAGIS incorporates population data for all transportation segments using the LandScan™ USA 2012 population distribution data model (Oak Ridge National Laboratory, 2018).

Table F-2: Distance by Route and Transportation Mode (Miles)

Origin	Destination	Rail	Ocean Barge	River Barge	Highway	Total
Brownsville, Texas (TX)	Waste Control Specialists (WCS) via Andrews	0	0	0	729	729
Brownsville, TX	WCS	0	0	0	729	729
Brownsville, TX	WCS	1,010	0	0	0	1,010
Brownsville, TX	DOE Savannah River Site (SRS) via Mobile	0	0	0	1,422	1,422
Brownsville, TX	SRS/Birmingham	0	0	0	1,422	1,422
Brownsville, TX	SRS	1,599	0	0	0	1,599
Brownsville, TX	SRS	0	1,668	187	58	1,913
Brownsville, TX	EnergySolutions (ES) via Midland	0	0	0	2,205	2,205
Brownsville, TX	ES via Lubbock	0	0	0	2,461	2,461
Brownsville, TX	ES	2,120	0	0	0	2,120
Newport News, Virginia (VA)	SRS via Charlotte	0	0	0	492	492
Newport News, VA	SRS via Richmond	0	0	0	545	545
Newport News, VA	SRS	605	0	0	0	605
Newport News, VA	SRS	0	0	599	0	599
Newport News, VA	WCS via Little Rock	0	0	0	1,806	1,806
Newport News, VA	WCS	0	0	0	1,806	1,806
Newport News, VA	WCS	2,271	0	0	0	2,271
Newport News, VA	WCS via Galveston-Houston	0	2,020	0	653	2,673
Newport News, VA	WCS via Beaumont	0	1,980	0	685	2,665
Newport News, VA	ES via Louisville	0	0	0	2,271	2,271
Newport News, VA	ES via Dayton	0	0	0	2,323	2,323
PSNS & IMF	DOE Hanford Site	0	208	502	26	736
Mobile, Alabama (AL)	WCS	0	0	0	819	819
Mobile, AL	WCS	1,259	0	0	0	1,259
Mobile, AL	SRS	0	0	0	490	490
Mobile, AL	SRS	748	0	0	0	748
Mobile, AL	SRS	0	1,263	187	58	1,508
Mobile, AL	ES	0	0	0	2,309	2,309
Mobile, AL	ES	2,034	0	0	0	2,034

Notes: (1) DOE = Department of Energy, PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility. (2) Barge transit from Newport News to SRS applies to Alternative 3 (Preferred Alternative). The barge is assumed to travel close to the shore and is treated as river barge transportation. (3) Some land routes have identical calculated mileages after rounding but are analyzed separately due to the potential for different population densities.

F.3 Normal Conditions of Transport General Public Exposure and Transportation Crew Exposure

F.3.1 Members of the General Public

Exposures received by the general public during normal conditions of transport are attributed to gamma radiation emanating from the shipments. Included in the RADTRAN analysis for normal conditions of transport are models predicting the following:

- exposure to persons within about one-half mile of each side of the transport route,
- exposures to persons (e.g., passengers on passing trains or vehicles) sharing the transport route, and
- exposures to persons at stops (e.g., residents or rail and truck crew not directly involved with the shipment).

F.3.2 Transportation Crew

The transportation crew exposure is associated with exposure directly from the shipment package during transit, including inspection periods. For truck shipments, RADTRAN assumes crew exposure is entirely from exposure during the transit period and no inspections occur. For both waterway and rail shipments, RADTRAN assumes crew exposure is from exposure during periods of package inspections and negligible during the transit time due to relatively long separation distances and shielding of intervening structures.

F.4 Accident Analysis

RADTRAN was used to calculate the radiological health consequences from a postulated and low probability severe accident. The RADTRAN model assumes the package is damaged and corrosion products are released into the atmosphere. The accident was modeled to occur at the location with the largest exposed population. Total activity in the package used in the model was bounding and higher than what would be expected for an actual accident. Worst-case accident severity and probability were applied to present a bounding radiation exposure value.

F.4.1 Individual Definitions, Exposure Pathways, and RADTRAN Formula

Accident doses include the following two exposure groups:

- General Public Exposure: exposure to all individuals within 50 miles for each of the three population densities (i.e., rural, suburban, and urban)
- Accident MEI Exposure: the highest accident dose to a member of the general public; the transportation crew is considered to be part of the General Public under accident conditions

The following four dose pathways are considered for accident analysis:

- Inhalation: inhalation of air containing radiation in gases or particles
- Re-suspension: direct exposure to radiation from resuspension of contamination deposited onto the ground surface
- Cloud Shine: direct exposure to radiation from the material suspended in the plume
- Ground Shine: direct exposure to radiation from contamination deposited on the ground

A specific formula is used to determine an estimate of the radiological exposure from that particular pathway with the total radiation exposure equal to the sum of the exposure for each pathway. The inhalation exposure is based on a committed effective dose to the body over a 50-year period. The dose

conversion factors are based on the International Commission on Radiological Protection (ICRP) 72 methodology for inhalation; external dose conversion factors are based on Federal Guidance Report 12 (FGR 12) using the ICRP 26 methodology.

The accident dose is integrated over the population at isopleths of increasing distance from the package. The basic formula used for accident dose calculations is:

$$DR = \mathrm{A(r)} * ARF * DCF * Pathway\ Factors$$

Where,

DR: Population exposure to receptor

A(r): Activity in the package; activity is calculated for each radionuclide in the package

r: Perpendicular distance of the individual receptor from the shipment path

Note: r is set to the lower limit for the MEI; population doses are integrated over 50 miles

ARF: Airborne Release Fraction; amount of material released into the air from an accident

DCF: Dose Conversion Factor; dependent on the dose pathway and the radionuclide

Pathway factors are specific to each exposure pathway and define the amount of exposure. They include factors such as exposure time, breathing rate, and unit conversions.

The calculated exposure is used to calculate the accident consequences expressed as radiation exposure.

F.4.2 Accident Risk

The radiological risk to the population considers the probability of the accident occurring and the probability of an accident of a particular severity damaging the package. Accident risk is calculated with the following generic formula:

$$Accident\ Risk = \mathrm{DR} * AP * ASF * RL * N$$

Where,

DR: Population exposure to receptor; formula provided in Section F.4.1 (Individual Definitions, Exposure Pathways, and RADTRAN Formula)

AP: Accident Probability; dependent on the transportation mode

ASF: Accident Severity Fraction; probability of damage to the package during an accident; dependent on the transportation mode

RL: Route Length; used to calculate the probability of occurrence of an accident

N: Number of individuals exposed to an accident; based on the population density; dependent on the route and the population density segment (i.e., rural, suburban, urban)

F.4.3 Total Activity

Total activity was calculated per reactor plant applying conservative estimates for radioactive material inventory from plant components. Additionally, total activity from that of the reactor vessel internal structure (used in Section 3.2 [Hazardous and Radioactive Waste Management]) was increased by a factor of 1.05 to conservatively account for activity outside the internal structure, but within the inner

surfaces of the reactor vessel itself and into the body of the vessel. This 5 percent increase is applied for radiation exposure modeling but is not used for waste classification. If this activity were included in a waste classification calculation, the increased volume of the additional material included would lower the curies per cubic meter fractions calculated.

Table F-3 shows estimated ex-Enterprise reactor vessel corrosion product activity for the radionuclides of relevance for the RADTRAN analysis.

Table F-3: Corrosion Product Radionuclide Inventory per Reactor Plant

Radionuclide Inventory	Total Activity (Ci)
C-14	4.44×10^{-1}
Co-58	1.30×10^{-3}
Co-60	2.28×10^{3}
Cs-134	8.48×10^{-3}
Cs-137	3.95×10^{-4}
Fe-55	1.13×10^{3}
H-3	2.24×10^{-1}
I-129	4.04×10^{-10}
Mn-54	6.00×10^{0}
Nb-94	1.64×10^{-1}
Ni-59	8.11×10^{1}
Ni-63	9.23×10^{3}
Pu-240	1.39×10^{-6}
Sr-90	3.27×10^{-4}
Ta-182	3.09×10^{-3}
Tc-99	7.31×10^{-3}
Y-90	3.27×10^{-4}
Zr-93	1.21×10^{-5}

Notes: C = Carbon, Ci = curie, Co = Cobalt, Cs = Cesium,
Fe = Iron, H = Hydrogen, I = Iodine, Mn = Manganese,
Nb = Niobium, Ni = Nickel, Pu = Plutonium,
Sr = Strontium, Ta = Tantalum, Tc = Technetium,
Y = Yttrium, Zr = Zirconium

Since the total activity and its assumed dispersion used in the hypothetical accident analyses are for scenarios which have never occurred, there is a large possibility of uncertainty in the calculated results. The total activity and its dispersion for the hypothetical accident analyses is dependent upon multiple factors. These factors for developing the total activity are chosen to ensure that the release to the environment is calculated to be conservative for the hypothetical accident scenarios. For example, the radiological material the accident scenarios is calculated on is considered to be conservative, and it is assumed that all released material is respirable (in the breathable range). The amount of damage to the package is dependent upon the nature and severity of the accident. This damage is represented by the airborne release fractions. The most conservative airborne release fraction based on historical

operations, 40 percent, was applied. In the hypothetical accident analyzed, the assumptions concerning the extent of damage to the package and airborne release fraction are expected to provide a conservative evaluation whose results would not be exceeded by reasonably foreseeable accidents of a similar type. The source term released to the environment is judged to be conservative for the hypothetical accident scenarios. The actual magnitude of the release from a transportation accident is expected to be between the value assigned in this EIS/OEIS and zero.

A deliberate destruction scenario is not considered reasonably foreseeable. As discussed above, the activity of concern is within metal structures that would resist destruction. The radioactivity is contained within packages containing higher activity components, such as the reactor vessels which contain many inches of durable corrosion resistant metal alloy up to 6 inches thick. Additionally, the radioactivity is contained within internal piping, components, and built-in shielding of the components within each package.

F.5 Calculated Radiation Exposure and Associated Health Risks

The analyses of the impacts from both normal transportation and hypothetical accidents associated with transportation presented in this analysis are based on conservative calculations. This is necessary because the transportation accidents analyzed have a low probability of occurrence and most of the impacts of normal transportation operations are so small that they cannot be measured. Cumulative exposures are from the entire dismantlement (i.e., all radioactive waste shipments considered). MEI exposures are from shipment of one reactor compartment package (Alternatives 1), a dual reactor compartment package (Alternative 2), or total packages associated with a single reactor plant (Alternative 3).

Table F-4 presents a summary of the highest reasonably foreseeable radiation exposure and estimated health risks based on the RADTRAN and WebTRAGIS analyses. Calculated total effective exposure is presented for general public (person-rem), transportation crew (person-rem), and maximum exposed individuals (rem).

The calculated total exposures were converted to hypothetical health effects expressed in terms of latent cancer fatalities (LCF). In determining a means of assessing health effects from radiation exposure, the ICRP has developed a weighting method for lethal and life-impairing cancers. The ICRP health risk conversion factors specify 0.00055 latent cancer fatalities per person-rem of exposure to the public and 0.00041 latent cancer fatalities per person-rem for workers (ICRP, 2007). The conversion factor for the general public is slightly higher than that for workers because the general public includes infants and children, who are more susceptible to the development of cancer over the course of their life. Adults over the age of 65 are also included in the ICRP factors for the general public. The risks associated with population exposure (person-rem) and maximum exposed individual (rem) are equivalent for equal exposure levels. For example, the risk associated with 0.1 rem exposure to a population of 10 persons (1.0 person-rem) is equivalent to the risk from exposure of 1 rem to 1 individual (1 person-rem).

F.5.1 Cumulative Normal Transport

The Cumulative Normal Transport radiation exposure values are the total exposure (as person-rem) for the entire population affected over the entire dismantlement (i.e., all radioactive waste shipments considered).

For Alternative 1, the Cumulative Normal Transport values represent radiation exposure associated with all reactor compartment packages, for a total of eight shipments. For Alternative 2, the Cumulative Normal Transport values represent radiation exposure associated with all dual reactor compartment packages, for a total of four shipments. For Alternative 3 (Preferred Alternative), the Cumulative Normal Transport values represent radiation exposure associated with 55 packages per reactor compartment as shown in Table F-1, for a total of eight reactor compartments (440 packages). Due to restricted access, no general public radiation exposure is accumulated for the transporter route from the Port of Benton to the DOE Hanford Site.

Table F-4: Summary of Radiation Exposure and Cancer Risk

Scenario Analyzed:	Alternative 1: General Public	Alternative 2: General Public	Alternative 3 (Preferred Alternative): General Public	Alternative 1: Transport Crew	Alternative 2: Transport Crew	Alternative 3 (Preferred Alternative): Transport Crew
Cumulative Normal Transport (person-rem, LCF)	5.4×10^{-3}, 2.9×10^{-6}	4.9×10^{-3}, 2.7×10^{-6}	2.5×10^{1}, 1.4×10^{-2}	4.2×10^{0}, 1.7×10^{-3}	3.6×10^{0}, 1.5×10^{-3}	8.7×10^{-1}, 3.6×10^{-4}
MEI (Normal Transport) (rem, LCF)	1.6×10^{-3}, 8.6×10^{-7}	2.8×10^{-3}, 1.5×10^{-6}	1.3×10^{-1}, 7.0×10^{-5}	9.6×10^{-2}, 3.9×10^{-5}	1.4×10^{-1}, 5.7×10^{-5}	5.5×10^{-2}, 2.2×10^{-5}
Cumulative Accident (person-rem, LCF)	1.8×10^{-3}, 9.8×10^{-7}	1.8×10^{-3}, 9.8×10^{-7}	2.8×10^{0}, 1.5×10^{-3}	see general public	see general public	see general public
MEI Accident (rem, LCF)	3.4×10^{-7}, 1.9×10^{-10}	6.8×10^{-7}, 3.7×10^{-10}	1.4×10^{-4}, 7.5×10^{-8}	see general public	see general public	see general public

Notes: (1) Rem to LCF data will not convert exactly due to rounding. (2) For Alternative 3 (Preferred Alternative), long-distance highway routes (such as to Utah) generally produce the largest radiation exposures. For some locations, summing multiple highway routes ensures a bounding estimate. For example, to ensure a bounding estimate for Alternative 3 in the event Mobile, Alabama was selected as a potential site for commercial dismantlement, the transportation route from Brownsville, Texas, to the DOE Savannah River Site near Aiken, South Carolina, that includes Mobile, Alabama, was added to the worst case route from Hampton Roads, Virginia, to Clive, Utah, and is presented as the bounding case in the table. (3) For Alternative 3 (Preferred Alternative), the MEI for highway transport to WCS in Texas is comparable to that for transport to EnergySolutions in Utah. The highway route MEI is provided for Alternative 3 rather than the barge transport MEI because barge transport is unlikely to be used for the majority of the shipments.

F.5.2 Maximum Exposed Individuals Normal Transport

Two types of single individual radiation exposures for MEIs were evaluated, general public MEI Exposure and Transportation Worker MEI Exposure. General Public MEI radiation exposure value is the maximum radiation exposure to a single member of the public from shipment of one reactor compartment package (Alternatives 1), a dual reactor compartment package (Alternative 2), or total packages associated with a single reactor plant (Alternative 3) (i.e., 55 packages as shown in Table F-1). Transportation Worker MEI exposure value is the maximum radiation exposure to a single member of the Transportation Crew, assuming a single crew member travels the entire route and is exposed at all stops. This is a conservative assumption as most shipments will not expose a single individual (the same person) to the highest radiation exposure for the entire shipment duration.

To evaluate the maximum individual exposure for both the general public and the transport crew, the following scenarios were analyzed:

For exposure to the general public during rail shipments, three scenarios were analyzed:

- Railyard Worker: a railyard worker working 33 ft. from the shipment for two-hours
- In-Transit MEI: a resident living 99 ft. from the rail line as the shipment is being transported
- Rail Stop Resident: a resident living 656 ft. from a stop where the shipment is located for 20 hours

The maximum occupational exposure during rail shipments was assumed to be that occurring from inspections of the package as calculated by RADTRAN.

For exposure to the general public for truck shipments via highway, three scenarios were analyzed:

- Motorist in Traffic: a motorist who is caught in traffic and located 3.3 ft. away from the shipment for 30 minutes
- In-Transit MEI: a resident living 99 ft. from the highway while the shipment is being transported
- Service Station Worker: a service station worker working at a distance of 66 ft. from the shipment for two hours

For truck shipments, the maximum exposed transportation worker was assumed to be the driver of the truck as calculated by RADTRAN.

For exposure to the general public for barge shipments via waterway, two scenarios were analyzed:

- Bridge Worker: a bridge workman located 33 ft. above the centerline of the shipment for two hours while the barge is stopped
- Disabled Motorist, Barge In-Transit MEI: a motorist who is disabled on a bridge above the water route during the total time the radiation exposure could be received by the motorist as the shipment is beneath the bridge; the motorist is positioned 33 ft. from the top of the package when the package is directly below

For barge shipments, the maximum exposed transportation worker was assumed to be a barge transportation crew member during transit as calculated by RADTRAN.

F.5.3 Cumulative Accident Dose Risk

The Cumulative Accident dose risk radiation exposure values are the total exposure (as person-rem) for the entire population affected based on the probability of an accident. Cumulative Accident values include radiation exposure to all individuals within 50 miles for each of the three population densities

(i.e., rural, suburban, and urban). For Cumulative Accident data, the transport crew is considered part of the general public in the vicinity of the accident affecting the population. To provide comparison between alternatives, the Cumulative Accident radiation exposure assumes the accident involves releases of radioactivity from all eight reactor compartments over the entire dismantlement (i.e., all radioactive waste shipments considered) for each alternative.

F.5.4 Maximum Exposed Individual Accident Dose Risk

The MEI Accident dose risk radiation exposure values are the radiation exposure (in rem) associated with release of corrosion products hypothetically released from one reactor compartment (for Alternatives 1 and 3) or two reactor compartments (for Alternative 2), based on the probability of an accident. The MEI for accident conditions is assumed to be a member of the public located 108 ft. from the accident. The MEI analysis does not consider dilution of the plume with distance.

F.6 Summary of Results

The results of the evaluation for shipments of low-level radioactive waste associated with Alternatives 1, 2, and 3 are summarized in Table F-4. While the reactor compartment packaging alternatives have lower calculated latent cancer fatalities (LCF) for the General Public than Alternative 3 (Preferred Alternative), the LCF totals for all Alternatives are low. For example, in Table F-4, the LCF results for the cumulative normal transport and accident scenarios combined is a potential risk of 0.016 additional cancer fatalities for the entire population exposed over the full transportation route for disposal of all eight reactor compartments. The calculated doses and probabilities are conservative and there is a low probability of a severe accident for the various transportation modes of interest. The dose risk calculated is considered bounding for normal conditions of transport and accident conditions for all alternatives analyzed and is consistent with the expected result given the low level of exposure to the population within prescribed federal limits for safe transport of radioactive material.

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Final Environmental Impact Statement/ Overseas Environmental Impact Statement

Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants

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Appendix G Socioeconomics Analysis Methodology Comparison

G.1 Purpose

This appendix describes the analysis used to estimate the local economy, low-income populations, housing, and minority populations of the Region of Influence (ROI) for the socioeconomic and environmental justice analysis and describes the differences between the existing analysis and the U.S. Environmental Protection Agency's (EPA) EJScreen tool (U.S. Environmental Protection Agency, 2022). This Final Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) includes an assessment of potential disproportionately high and adverse effects on minority and low-income populations consistent with the guidance published by the Council on Environmental Quality (CEQ). The analysis uses demographic data from the U.S. Census Bureau, similar to the data available through EJScreen, and evaluates potential adverse effects on minority and low-income populations based on the technical analyses prepared for the Proposed Action and alternatives.

G.1.1 Region of Influence

The detailed ROI for socioeconomic and environmental justice analysis is defined and outlined in this EIS/OEIS as the independent cities and counties immediately surrounding the naval and commercial facilities where the transport, dismantlement, and disposal of ex-Enterprise may occur. The ROI includes locations in the states of Washington, Virginia, Texas, and Alabama, encompassing the following areas:

- The ROI for Washington includes the city of Bremerton and Kitsap County, in which Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) is located; the city of Pasco and Franklin County; as well as the city of Richland, city of Kennewick, and Benton County, where the Department of Energy (DOE) Hanford Site is located (Section 3.4 [Socioeconomics and Environmental Justice] of this EIS/OEIS, Figure 3.4-1 and Figure 3.4-2).
- The ROI for Hampton Roads Metropolitan Area, Virginia, includes the independent cities (i.e., not included in a county) of Newport News, Norfolk, Hampton, Virginia Beach, Chesapeake, Portsmouth, Poquoson, Suffolk, and Williamsburg, as well as the counties of Isle of Wight, Surry, York, and James City (Section 3.4 [Socioeconomics and Environmental Justice] of this EIS/OEIS, Figure 3.4-3).
- The ROI for Brownsville, Texas, includes the city of Brownsville and the surrounding Cameron, Hidalgo, and Willacy counties (Section 3.4 [Socioeconomics and Environmental Justice] of this EIS/OEIS, Figure 3.4-4).
- The ROI for Mobile, Alabama, includes the city of Mobile, and Mobile and Baldwin counties (Section 3.4 [Socioeconomics and Environmental Justice] of this EIS/OEIS, Figure 3.4-5).

G.1.2 Regulatory Framework

There are no federal or state regulations pertaining to socioeconomic impacts. Socioeconomic impacts are an element of National Environmental Policy Act documentation that must be addressed and mitigated, if warranted. No specific permits are anticipated under this discipline.

Executive Order (EO) 13840, *Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States*, aims to improve interagency coordination for management of ocean, coastal, and Great Lakes waters to allow for productive and sustainable use of these resources. EO 13840 also aims to facilitate the economic growth of coastal communities and promote ocean industries, advance ocean science and technology, transport goods, expand recreational opportunities, harvest food, and enhance energy security. All activities associated with the dismantlement and disposal of ex-Enterprise would be consistent with this EO.

Potential impacts on community demographics and housing related to environmental justice populations are evaluated based on EO 12898, *Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*. EO 12898 requires consideration of whether the Proposed Action and alternatives would disproportionately affect minority or low-income groups. This EO requires that no minority or low-income population group should bear a disproportionate share of potential adverse environmental justice population and socioeconomic resources impacts resulting from major projects, in this case the transportation, dismantlement, and disposal of ex-Enterprise. Projects involving federal funding or approvals require an environmental justice evaluation as part of the environmental review. In addition to EO 12898, federal concerns for nondiscrimination under Title VI of the Civil Rights Act of 1964 are applicable under the environmental justice analysis. Each federal agency has developed a strategy to address environmental justice, with the CEQ responsible for oversight and coordination. The environmental justice analysis for the Proposed Action and alternatives follows the most updated versions of guidance and methodologies recommended in the CEQ Environmental Justice Guidelines under the National Environmental Policy Act.

Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, amends EO 12898 to establish a White House Environmental Justice Interagency Council to develop a strategy to address current and historic environmental injustice and clear performance metrics to ensure accountability, and publish an annual public performance scorecard on its implementation.

G.1.3 Best Management Practices

Best management practices include policies, practices, and measures that would be implemented to minimize adverse socioeconomic resources and environmental justice population impacts associated with the Proposed Action and alternatives. Procedures and policies used by the U.S. Department of the Navy (Navy) to address disproportionately high and adverse health effects have been effective in protecting minority and low-income populations. For other best management practices related to human health and safety, please refer to Section 3.1 (Public Health and Safety) and Section 3.2 (Hazardous and Radioactive Waste Management) of this EIS/OEIS.

G.2 Analysis Models

G.2.1 Approach to Analysis in Final EIS/OEIS

Socioeconomic data provided in Section 3.4 (Socioeconomics and Environmental Justice) of this EIS/OEIS are presented at city, county, regional, state, and national levels to characterize baseline socioeconomic conditions in the context of local, regional, state, and national trends. The baseline for identifying the socioeconomic conditions was derived using relevant published information from sources that include federal and state government agencies and databases. Previous environmental studies were also reviewed. These data were used to identify potential impacts from the transportation, dismantlement, and disposal of ex-Enterprise on the human environment, including environmental justice populations, in the ROI described above.

In 2012, the Navy prepared the *Final Environmental Assessment on the Disposal of Decommissioned Defueled Naval Reactor Plants from USS ENTERPRISE (CVN 65)* (Navy & DOE, 2012). The approach for Section 3.4 (Socioeconomics and Environmental Justice) of this CVN-65 EIS/OEIS takes into consideration the socioeconomic and environmental justice concerns previously expressed to the Navy as part of other actions in the aforementioned 2012 Environmental Assessment and any other concerns raised during the preparation of this CVN-65 EIS/OEIS.

Each of these socioeconomic resources provides data on an aspect of the human environment that involves economics (e.g., employment, income, or revenue) and social conditions (e.g., population, enjoyment, and quality of life) associated with the human environment of the ROI.

The economic characteristics of the ROI are evaluated against the economic conditions of comparison geographies of the state in which the ROI is located as well as the nation. Socioeconomic changes related to direct expenditures in the local community are considered minimal if there is little or no impact on housing market (availability and value), income, employment rate, poverty rate or the population (either increases or decreases).

Environmental justice addresses low-income and minority populations by analyzing the demographic and economic characteristics of the affected area and comparing it to the characteristics of the larger geography. The U.S. Census Bureau uses a set income threshold to determine who classifies as impoverished. When total income of a family or individual is less than the threshold, the family or individual is considered to be living in poverty. Individuals who self-identify as members of the following racial/ethnic groups are considered a minority population group: Black or African American, not of Hispanic or Latino origin; American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; Hispanic or Latino of any race; and Two or More Races, as defined by the U.S. Census Bureau. For the purposes of the analysis, an ROI was determined to have a meaningful minority population if the percentage of persons identified as minority in the ROI was greater than the comparison geography (CEQ, 1997). Low-income populations in an ROI are typically defined as communities that have (1) more than 50 percent low-income persons, or (2) the percentage of persons in households below the poverty level is significantly greater than in the geographical area chosen for comparative analysis. For both minority and low-income populations, the applicable ROI and the United States were used as comparison geographies. Potential impacts of the Proposed Action and alternatives are evaluated for the potential to disproportionately impact minority and/or low-income populations.

Due to the industrial nature of the existing commercial and Navy facilities, based on the analyses of census data and data on other sensitive populations—concentrations of children, elderly, disabled, female-headed households, and transit-dependent populations—were determined not reasonably foreseeable. Activities associated with the Proposed Action and alternatives would be conducted at existing industrial facilities or within established transportation routes, away from sensitive populations, including children. Therefore, Section 3.4 (Socioeconomics and Environmental Justice) of this EIS/OEIS does not address EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, in detail.

The potential impacts on community demographics and housing related to environmental justice populations were evaluated based on EO 12898. EO 12898 requires consideration of whether the Proposed Action and alternatives would disproportionately affect minority or low-income groups. Socioeconomic changes related to direct expenditures in the local community were based on housing market, employment, or the population (either increases or decreases). These data were used to identify potential impacts from the transportation, dismantlement, and disposal of ex-Enterprise on the human environment, including environmental justice populations, in the ROI. Section 3.4 (Socioeconomics and Environmental Justice) of this EIS/OEIS addresses the characteristics of low-income and minority populations, and aspects of the human environment that involve economic and social conditions associated with the human environment.

Partial dismantlement at a commercial dismantlement facility (with in-water activities) under the reactor compartment packaging alternatives would not result in impacts related to socioeconomic resources and environmental justice populations because all activities conducted at these facilities would occur within existing shipyard capabilities and would adhere to existing federal, state, and local regulations. Therefore, this action is not discussed further under the reactor compartment packaging alternatives analysis in this section. Additionally, the transport of low-level radioactive waste (LLRW) incidental to reactor plant dismantlement and disposal of non-radioactive wastes at appropriate approved disposal facilities would not result in impacts on socioeconomic resources or disproportionate impacts on environmental justice populations. Descriptions of these activities are in Chapter 2 (Description of Proposed Action and Alternatives) of this EIS/OEIS. Incidental LLRW transport would not have impacts because the dismantlement process is expected to generate wastes that would not result in any measurable radiation exposure to the general public during transport. Non-radioactive waste disposal would not have impacts because this action is a normal operation of disposal facilities, and the Proposed Action would not increase or alter current work conducted at these sites. As such, these actions are not discussed further in this analysis.

G.2.2 EJScreen

The EPA's EJScreen is an environmental justice mapping and screening tool developed by the EPA that provides the EPA with a nationally consistent dataset and approach for combining environmental and demographic indicators. EJScreen is sourced from the U.S. Census Bureau American Community Survey (ACS) 5-Year Estimates. The following are the seven socioeconomic indicators featured in EJScreen.

- People of color: The percentage of individuals in a block group who list their racial status as a race other than white alone and/or list their ethnicity as Hispanic or Latino. That is, all people other than non-Hispanic white-alone individuals. The word "alone" in this case indicates that the person is of a single race, not multiracial.
- Low-income: The percentage of a block group's population in households where the household income is less than or equal to twice the federal "poverty level."
- Unemployment rate: The percentage of a block group's population that did not have a job at all during the reporting period, made at least one specific active effort to find a job during the prior four weeks, and were available for work (unless temporarily ill).
- Limited English speaking: Percentage of people in a block group living in limited English-speaking households. A household in which all members age 14 years and over speak a non-English language and also speak English less than "very well" (have difficulty with English) is limited English speaking.
- Less than high school education: Percentage of people age 25 or older in a block group whose education is short of a high school diploma.
- Under age 5: Percentage of people in a block group under the age of 5.
- Over age 64: Percentage of people in a block group over the age of 64.

EJScreen includes the following two indexes that are based on the above socioeconomic indicators:

- Demographic Index: Based on the average of two socioeconomic indicators: low-income and people of color.
- Supplemental Demographic Index: Based on the average of five socioeconomic indicators low-income, unemployment, limited English, less than high school education, and low life expectancy (which is a health dataset).

EJScreen was developed by the EPA to highlight places that may be candidates for further review, analysis, or outreach to support the agency's environmental justice work. EJScreen has been released to the public in an effort to be more transparent in how they consider environmental justice, assist stakeholders in making informed decisions related to environmental justice, and to create a common starting point between agencies and the public. There is no mandate or guidance expressed or implied that state governments or other entities should use the tool or its underlying data.

G.2.3 The Climate and Economic Justice Screening Tool

The Climate and Economic Justice Screening Tool (CEJST) is a new tool that identifies communities that have faced historical injustices and have borne the brunt of pollution. The CEJST was released this year and is in a beta version. The beta version of CEJST was made available for testing and feedback and thus is still in a developmental phase. The CEJST website also notes that the tool has limited datasets and will be regularly updated in the beta version. Because of this, the CEJST would not be reliable in providing accurate estimates of data. Therefore, information from the CEJST will not be considered for Section 3.4 (Socioeconomics and Environmental Justice) of this EIS/OEIS or this appendix.

G.3 Summary of Results

As indicated above in Section G.2.1 (Approach to Analysis in Final EIS/OEIS), the baseline for identifying the socioeconomic conditions was derived using relevant published information from sources that include federal and state government agencies and databases. Previous environmental studies were also reviewed. These data were used to identify potential impacts from the transportation, dismantlement, and disposal of ex-Enterprise on the human environment, including environmental justice populations, in the ROI described above. The applicable dataset comparable to EJScreen is the U.S. Census data. The dataset in Section 3.4 (Socioeconomics and Environmental Justice) of this EIS/OEIS was from 2019, while EJScreen's dataset is currently displaying a 2016–2020 dataset. The EJScreen reports for each ROI are attached to this appendix for reference. Comparing Section 3.4 (Socioeconomics and Environmental Justice) of this EIS/OEIS data and EJScreen's data will be different because the data is based on two different time periods. However, a comparison between the population, local economy and low-income populations, housing information, and minority populations datasets was conducted. The comparison between the datasets shows negligible differences and does not change the adequacy of the environmental impact analysis in Section 3.4 (Socioeconomics and Environmental Justice) of this EIS/OEIS.

It should also be noted that EJScreen is used as a preliminary step to screen areas that may need additional consideration and a detailed risk assessment. EJScreen is not intended to be used to quantify specific risk values for a selected area or measure the cumulative impacts of multiple environmental factors. Therefore the use of the demographic data from the U.S. Census Bureau, similar to what is available through EJScreen, is adequate to evaluate potential adverse effects on minority and low-income populations based on the technical analyses prepared for the Proposed Action and alternatives. Additionally, the data in Section 3.4 (Socioeconomics and Environmental Justice) of this EIS/OEIS are consistent with the guidance published by the CEQ.

REFERENCES

Council on Environmental Quality. (1997). *Environmental Justice Guidance Under the National Environmental Policy Act* Washington, D.C.: Executive Office of the President, Council on Environmental Quality.

U.S. Department of the Navy & U.S. Department of Energy. (2012). *Final Environmental Assessment on the Disposal of Decommissioned Defueled Naval Reactor Plants from USS ENTERPRISE (CVN 65)*. Washington, D.C.: U.S. Department of Defense.

EJScreen Reports

EJSCREEN ACS Summary Report

Location: Baldwin County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	218,289
Population Density (per sq. mile)	137
People of Color Population	37,334
% People of Color Population	17%
Households	84,047
Housing Units	116,747
Housing Units Built Before 1950	4,309
Per Capita Income	33,751
Land Area (sq. miles) (Source: SF1)	1,589.84
% Land Area	78%
Water Area (sq. miles) (Source: SF1)	437.44
% Water Area	22%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	218,289	100%	0
Population Reporting One Race	212,612	97%	3,613
White	186,504	85%	1,173
Black	19,153	9%	728
American Indian	1,514	1%	418
Asian	2,033	1%	352
Pacific Islander	10	0%	16
Some Other Race	3,398	2%	926
Population Reporting Two or More Races	5,677	3%	1,040
Total Hispanic Population	9,947	5%	0
Total Non-Hispanic Population	208,342		
White Alone	180,955	83%	654
Black Alone	19,027	9%	744
American Indian Alone	1,327	1%	371
Non-Hispanic Asian Alone	2,033	1%	352
Pacific Islander Alone	10	0%	16
Other Race Alone	740	0%	534
Two or More Races Alone	4,250	2%	871
Population by Sex			
Male	105,889	49%	253
Female	112,400	51%	253
Population by Age			
Age 0-4	11,960	5%	159
Age 0-17	46,993	22%	1,121
Age 18+	171,296	78%	2,642
Age 65+	44,716	20%	1,490

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: Baldwin County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	155,563	100%	247
Less than 9th Grade	3,834	2%	537
9th - 12th Grade, No Diploma	10,989	7%	1,164
High School Graduate	42,272	27%	1,846
Some College, No Degree	34,475	22%	1,653
Associate Degree	14,357	9%	1,092
Bachelor's Degree or more	49,636	32%	2,061
Population Age 5+ Years by Ability to Speak English			
Total	206,329	100%	147
Speak only English	196,027	95%	1,048
Non-English at Home[1+2+3+4]	10,302	5%	1,052
[1]Speak English "very well"	6,569	3%	978
[2]Speak English "well"	2,140	1%	581
[3]Speak English "not well"	1,375	1%	436
[4]Speak English "not at all"	218	0%	157
[3+4]Speak English "less than well"	1,593	1%	462
[2+3+4]Speak English "less than very well"	3,733	2%	742
Linguistically Isolated Households*			
Total	666	100%	280
Speak Spanish	553	83%	255
Speak Other Indo-European Languages	23	3%	30
Speak Asian-Pacific Island Languages	90	14%	108
Speak Other Languages	0	0%	29
Households by Household Income			
Household Income Base	84,047	100%	1,143
< $15,000	8,363	10%	1,074
$15,000 - $25,000	6,436	8%	714
$25,000 - $50,000	20,143	24%	1,475
$50,000 - $75,000	14,118	17%	1,106
$75,000 +	34,987	42%	1,723
Occupied Housing Units by Tenure			
Total	84,047	100%	1,143
Owner Occupied	64,716	77%	1,320
Renter Occupied	19,331	23%	1,187
Employed Population Age 16+ Years			
Total	176,852	100%	466
In Labor Force	103,116	58%	1,621
Civilian Unemployed in Labor Force	4,027	2%	714
Not In Labor Force	73,736	42%	1,678

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: Baldwin County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	206,329	100%	147
English	196,027	95%	1,175
Spanish	6,580	3%	772
French, Haitian, or Cajun	661	0%	579
German or other West Germanic	358	0%	148
Russian, Polish, or Other Slavic	553	0%	345
Other Indo-European	1,155	1%	736
Korean	96	0%	122
Chinese (including Mandarin, Cantonese)	343	0%	268
Vietnamese	133	0%	141
Tagalog (including Filipino)	26	0%	32
Other Asian and Pacific Island	350	0%	204
Arabic	22	0%	28
Other and Unspecified	25	0%	32
Total Non-English	10,302	5%	1,184

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: Benton County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	200,715
Population Density (per sq. mile)	118
People of Color Population	61,001
% People of Color Population	30%
Households	73,073
Housing Units	77,486
Housing Units Built Before 1950	8,976
Per Capita Income	34,287
Land Area (sq. miles) (Source: SF1)	1,700.13
% Land Area	97%
Water Area (sq. miles) (Source: SF1)	59.57
% Water Area	3%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	200,715	100%	0
Population Reporting One Race	189,919	95%	4,660
White	161,897	81%	1,715
Black	3,526	2%	357
American Indian	1,768	1%	526
Asian	5,669	3%	492
Pacific Islander	186	0%	122
Some Other Race	16,873	8%	1,448
Population Reporting Two or More Races	10,796	5%	1,266
Total Hispanic Population	44,714	22%	0
Total Non-Hispanic Population	156,001		
White Alone	139,714	70%	289
Black Alone	3,167	2%	261
American Indian Alone	1,180	1%	319
Non-Hispanic Asian Alone	5,541	3%	468
Pacific Islander Alone	174	0%	117
Other Race Alone	603	0%	389
Two or More Races Alone	5,622	3%	628
Population by Sex			
Male	100,412	50%	189
Female	100,303	50%	189
Population by Age			
Age 0-4	13,968	7%	252
Age 0-17	53,388	27%	1,248
Age 18+	147,327	73%	1,957
Age 65+	29,916	15%	1,123

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: Benton County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	130,405	100%	207
Less than 9th Grade	5,748	4%	639
9th - 12th Grade, No Diploma	5,961	5%	641
High School Graduate	30,783	24%	1,339
Some College, No Degree	33,177	25%	1,425
Associate Degree	13,547	10%	832
Bachelor's Degree or more	41,189	32%	1,403
Population Age 5+ Years by Ability to Speak English			
Total	186,747	100%	41
Speak only English	147,786	79%	1,315
Non-English at Home[1+2+3+4]	38,961	21%	1,409
[1]Speak English "very well"	24,691	13%	1,344
[2]Speak English "well"	7,031	4%	729
[3]Speak English "not well"	4,984	3%	751
[4]Speak English "not at all"	2,255	1%	581
[3+4]Speak English "less than well"	7,239	4%	950
[2+3+4]Speak English "less than very well"	14,270	8%	1,197
Linguistically Isolated Households*			
Total	2,173	100%	452
Speak Spanish	1,525	70%	400
Speak Other Indo-European Languages	282	13%	132
Speak Asian-Pacific Island Languages	244	11%	119
Speak Other Languages	122	6%	113
Households by Household Income			
Household Income Base	73,073	100%	599
< $15,000	5,294	7%	638
$15,000 - $25,000	4,908	7%	621
$25,000 - $50,000	13,856	19%	1,001
$50,000 - $75,000	13,844	19%	867
$75,000 +	35,171	48%	1,353
Occupied Housing Units by Tenure			
Total	73,073	100%	599
Owner Occupied	50,485	69%	1,018
Renter Occupied	22,588	31%	1,041
Employed Population Age 16+ Years			
Total	153,256	100%	363
In Labor Force	94,804	62%	1,321
Civilian Unemployed in Labor Force	5,041	3%	645
Not In Labor Force	58,452	38%	1,312

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: Benton County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	186,747	100%	41
English	147,786	79%	1,512
Spanish	29,577	16%	1,208
French, Haitian, or Cajun	292	0%	453
German or other West Germanic	806	0%	267
Russian, Polish, or Other Slavic	1,725	1%	609
Other Indo-European	2,061	1%	681
Korean	209	0%	127
Chinese (including Mandarin, Cantonese)	688	0%	280
Vietnamese	573	0%	233
Tagalog (including Filipino)	594	0%	269
Other Asian and Pacific Island	1,011	1%	346
Arabic	1,003	1%	438
Other and Unspecified	422	0%	242
Total Non-English	38,961	21%	1,513

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Bremerton city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	40,749
Population Density (per sq. mile)	1,451
People of Color Population	13,175
% People of Color Population	32%
Households	16,598
Housing Units	18,035
Housing Units Built Before 1950	6,594
Per Capita Income	32,572
Land Area (sq. miles) (Source: SF1)	28.09
% Land Area	87%
Water Area (sq. miles) (Source: SF1)	4.08
% Water Area	13%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	40,749	100%	1,659
Population Reporting One Race	36,337	89%	2,425
White	29,311	72%	1,335
Black	2,168	5%	205
American Indian	329	1%	132
Asian	2,164	5%	202
Pacific Islander	287	1%	177
Some Other Race	2,077	5%	374
Population Reporting Two or More Races	4,412	11%	413
Total Hispanic Population	4,853	12%	382
Total Non-Hispanic Population	35,896		
White Alone	27,574	68%	1,340
Black Alone	2,160	5%	205
American Indian Alone	275	1%	122
Non-Hispanic Asian Alone	2,143	5%	202
Pacific Islander Alone	287	1%	177
Other Race Alone	111	0%	95
Two or More Races Alone	3,346	8%	322
Population by Sex			
Male	21,379	52%	863
Female	19,371	48%	816
Population by Age			
Age 0-4	2,630	6%	174
Age 0-17	6,878	17%	228
Age 18+	33,871	83%	818
Age 65+	5,219	13%	169

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Bremerton city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	27,219	100%	455
Less than 9th Grade	540	2%	104
9th - 12th Grade, No Diploma	973	4%	142
High School Graduate	6,438	24%	174
Some College, No Degree	8,754	32%	203
Associate Degree	3,639	13%	190
Bachelor's Degree or more	6,875	25%	282
Population Age 5+ Years by Ability to Speak English			
Total	38,120	100%	1,659
Speak only English	34,791	91%	1,667
Non-English at Home[1+2+3+4]	3,328	9%	267
[1]Speak English "very well"	2,035	5%	164
[2]Speak English "well"	783	2%	165
[3]Speak English "not well"	345	1%	150
[4]Speak English "not at all"	166	0%	137
[3+4]Speak English "less than well"	510	1%	175
[2+3+4]Speak English "less than very well"	1,293	3%	192
Linguistically Isolated Households*			
Total	291	100%	67
Speak Spanish	62	21%	66
Speak Other Indo-European Languages	17	6%	22
Speak Asian-Pacific Island Languages	172	59%	44
Speak Other Languages	41	14%	43
Households by Household Income			
Household Income Base	16,598	100%	261
< $15,000	1,885	11%	94
$15,000 - $25,000	1,561	9%	152
$25,000 - $50,000	3,806	23%	192
$50,000 - $75,000	3,477	21%	157
$75,000 +	5,868	35%	295
Occupied Housing Units by Tenure			
Total	16,598	100%	261
Owner Occupied	7,741	47%	258
Renter Occupied	8,857	53%	188
Employed Population Age 16+ Years			
Total	34,334	100%	1,660
In Labor Force	22,580	66%	1,660
Civilian Unemployed in Labor Force	1,000	3%	134
Not In Labor Force	11,754	34%	355

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Bremerton city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	41,018	100%	1,659
English	37,348	91%	1,666
Spanish	1,650	4%	373
French, Haitian, or Cajun	66	0%	169
German or other West Germanic	126	0%	47
Russian, Polish, or Other Slavic	39	0%	23
Other Indo-European	216	1%	270
Korean	34	0%	38
Chinese (including Mandarin, Cantonese)	130	0%	113
Vietnamese	73	0%	67
Tagalog (including Filipino)	861	2%	130
Other Asian and Pacific Island	338	1%	129
Arabic	14	0%	24
Other and Unspecified	123	0%	138
Total Non-English	3,670	9%	2,351

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Brownsville city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	182,589
Population Density (per sq. mile)	1,382
People of Color Population	173,900
% People of Color Population	95%
Households	53,386
Housing Units	58,391
Housing Units Built Before 1950	3,130
Per Capita Income	17,068
Land Area (sq. miles) (Source: SF1)	132.09
% Land Area	91%
Water Area (sq. miles) (Source: SF1)	13.09
% Water Area	9%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	182,589	100%	1,366
Population Reporting One Race	163,546	90%	2,811
White	155,526	85%	1,362
Black	692	0%	246
American Indian	134	0%	58
Asian	1,175	1%	211
Pacific Islander	17	0%	23
Some Other Race	6,003	3%	911
Population Reporting Two or More Races	19,043	10%	1,141
Total Hispanic Population	171,901	94%	1,366
Total Non-Hispanic Population	10,688		
White Alone	8,689	5%	511
Black Alone	450	0%	191
American Indian Alone	63	0%	51
Non-Hispanic Asian Alone	1,114	1%	211
Pacific Islander Alone	11	0%	23
Other Race Alone	44	0%	37
Two or More Races Alone	317	0%	120
Population by Sex			
Male	87,822	48%	877
Female	94,767	52%	1,061
Population by Age			
Age 0-4	14,889	8%	417
Age 0-17	54,306	30%	585
Age 18+	128,283	70%	908
Age 65+	22,630	12%	534

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Brownsville city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	105,114	100%	814
Less than 9th Grade	20,201	19%	439
9th - 12th Grade, No Diploma	15,633	15%	535
High School Graduate	24,794	24%	367
Some College, No Degree	16,881	16%	373
Associate Degree	6,874	7%	466
Bachelor's Degree or more	20,732	20%	366
Population Age 5+ Years by Ability to Speak English			
Total	167,700	100%	1,353
Speak only English	24,776	15%	610
Non-English at Home[1+2+3+4]	142,924	85%	1,225
[1]Speak English "very well"	95,978	57%	1,010
[2]Speak English "well"	13,888	8%	380
[3]Speak English "not well"	15,275	9%	394
[4]Speak English "not at all"	17,782	11%	740
[3+4]Speak English "less than well"	33,058	20%	748
[2+3+4]Speak English "less than very well"	46,946	28%	754
Linguistically Isolated Households*			
Total	10,187	100%	381
Speak Spanish	10,068	99%	381
Speak Other Indo-European Languages	28	0%	35
Speak Asian-Pacific Island Languages	91	1%	59
Speak Other Languages	0	0%	14
Households by Household Income			
Household Income Base	53,386	100%	463
< $15,000	10,398	19%	272
$15,000 - $25,000	7,206	13%	208
$25,000 - $50,000	12,740	24%	374
$50,000 - $75,000	9,776	18%	466
$75,000 +	13,265	25%	320
Occupied Housing Units by Tenure			
Total	53,386	100%	463
Owner Occupied	32,568	61%	453
Renter Occupied	20,817	39%	408
Employed Population Age 16+ Years			
Total	135,119	100%	1,284
In Labor Force	76,624	57%	794
Civilian Unemployed in Labor Force	4,637	3%	151
Not In Labor Force	58,494	43%	707

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Brownsville city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	172,205	100%	1,436
English	25,570	15%	746
Spanish	145,286	84%	1,476
French, Haitian, or Cajun	186	0%	118
German or other West Germanic	22	0%	26
Russian, Polish, or Other Slavic	35	0%	30
Other Indo-European	210	0%	118
Korean	23	0%	28
Chinese (including Mandarin, Cantonese)	24	0%	37
Vietnamese	561	0%	211
Tagalog (including Filipino)	138	0%	78
Other Asian and Pacific Island	26	0%	27
Arabic	58	0%	98
Other and Unspecified	65	0%	47
Total Non-English	146,635	85%	1,618

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: Cameron County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	422,135
Population Density (per sq. mile)	473
People of Color Population	385,192
% People of Color Population	91%
Households	126,968
Housing Units	152,544
Housing Units Built Before 1950	7,633
Per Capita Income	18,247
Land Area (sq. miles) (Source: SF1)	891.71
% Land Area	70%
Water Area (sq. miles) (Source: SF1)	384.72
% Water Area	30%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	422,135	100%	0
Population Reporting One Race	381,314	90%	6,374
White	358,405	85%	3,500
Black	2,295	1%	456
American Indian	732	0%	171
Asian	2,887	1%	192
Pacific Islander	118	0%	42
Some Other Race	16,877	4%	2,013
Population Reporting Two or More Races	40,821	10%	3,074
Total Hispanic Population	379,216	90%	0
Total Non-Hispanic Population	42,919		
White Alone	36,943	9%	84
Black Alone	1,609	0%	130
American Indian Alone	419	0%	103
Non-Hispanic Asian Alone	2,809	1%	163
Pacific Islander Alone	112	0%	41
Other Race Alone	49	0%	47
Two or More Races Alone	978	0%	247
Population by Sex			
Male	205,824	49%	177
Female	216,311	51%	177
Population by Age			
Age 0-4	34,035	8%	106
Age 0-17	128,418	30%	1,928
Age 18+	293,717	70%	2,978
Age 65+	57,036	14%	1,667

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: Cameron County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	248,705	100%	197
Less than 9th Grade	43,429	17%	1,799
9th - 12th Grade, No Diploma	34,775	14%	1,764
High School Graduate	64,940	26%	1,966
Some College, No Degree	42,347	17%	1,751
Associate Degree	18,068	7%	1,124
Bachelor's Degree or more	45,146	18%	1,729
Population Age 5+ Years by Ability to Speak English			
Total	388,100	100%	78
Speak only English	112,085	29%	3,299
Non-English at Home[1+2+3+4]	276,015	71%	3,324
[1]Speak English "very well"	183,703	47%	3,251
[2]Speak English "well"	30,159	8%	1,582
[3]Speak English "not well"	31,604	8%	1,508
[4]Speak English "not at all"	30,549	8%	1,919
[3+4]Speak English "less than well"	62,153	16%	2,440
[2+3+4]Speak English "less than very well"	92,312	24%	2,908
Linguistically Isolated Households*			
Total	20,038	100%	1,132
Speak Spanish	19,869	99%	1,128
Speak Other Indo-European Languages	68	0%	54
Speak Asian-Pacific Island Languages	101	1%	72
Speak Other Languages	0	0%	33
Households by Household Income			
Household Income Base	126,968	100%	1,167
< $15,000	22,933	18%	1,240
$15,000 - $25,000	17,410	14%	1,136
$25,000 - $50,000	32,047	25%	1,587
$50,000 - $75,000	22,667	18%	1,273
$75,000 +	31,911	25%	1,611
Occupied Housing Units by Tenure			
Total	126,968	100%	1,167
Owner Occupied	84,054	66%	1,573
Renter Occupied	42,914	34%	1,447
Employed Population Age 16+ Years			
Total	308,958	100%	651
In Labor Force	174,088	56%	1,893
Civilian Unemployed in Labor Force	9,794	3%	921
Not In Labor Force	134,870	44%	1,894

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: Cameron County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	388,100	100%	78
English	112,085	29%	4,069
Spanish	272,888	70%	4,055
French, Haitian, or Cajun	369	0%	198
German or other West Germanic	160	0%	74
Russian, Polish, or Other Slavic	49	0%	39
Other Indo-European	668	0%	221
Korean	23	0%	28
Chinese (including Mandarin, Cantonese)	114	0%	98
Vietnamese	644	0%	235
Tagalog (including Filipino)	544	0%	210
Other Asian and Pacific Island	195	0%	142
Arabic	110	0%	122
Other and Unspecified	251	0%	221
Total Non-English	276,015	71%	4,070

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Chesapeake city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	242,647
Population Density (per sq. mile)	717
People of Color Population	105,769
% People of Color Population	44%
Households	86,524
Housing Units	91,707
Housing Units Built Before 1950	3,589
Per Capita Income	38,003
Land Area (sq. miles) (Source: SF1)	338.46
% Land Area	96%
Water Area (sq. miles) (Source: SF1)	12.49
% Water Area	4%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	242,647	100%	1,320
Population Reporting One Race	230,002	95%	3,597
White	144,744	60%	1,385
Black	71,988	30%	973
American Indian	526	0%	203
Asian	8,271	3%	445
Pacific Islander	23	0%	25
Some Other Race	4,450	2%	566
Population Reporting Two or More Races	12,645	5%	767
Total Hispanic Population	15,813	7%	547
Total Non-Hispanic Population	226,834		
White Alone	136,878	56%	1,280
Black Alone	70,466	29%	973
American Indian Alone	346	0%	109
Non-Hispanic Asian Alone	8,057	3%	445
Pacific Islander Alone	23	0%	25
Other Race Alone	996	0%	565
Two or More Races Alone	10,068	4%	765
Population by Sex			
Male	118,604	49%	733
Female	124,043	51%	859
Population by Age			
Age 0-4	15,479	6%	344
Age 0-17	58,883	24%	563
Age 18+	183,764	76%	834
Age 65+	32,095	13%	382

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Chesapeake city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	163,257	100%	930
Less than 9th Grade	3,536	2%	204
9th - 12th Grade, No Diploma	7,527	5%	189
High School Graduate	38,715	24%	429
Some College, No Degree	40,284	25%	442
Associate Degree	16,717	10%	403
Bachelor's Degree or more	56,478	35%	502
Population Age 5+ Years by Ability to Speak English			
Total	227,168	100%	1,245
Speak only English	207,774	91%	936
Non-English at Home[1+2+3+4]	19,394	9%	685
[1]Speak English "very well"	12,918	6%	415
[2]Speak English "well"	3,333	1%	207
[3]Speak English "not well"	2,187	1%	425
[4]Speak English "not at all"	956	0%	201
[3+4]Speak English "less than well"	3,143	1%	432
[2+3+4]Speak English "less than very well"	6,476	3%	479
Linguistically Isolated Households*			
Total	1,168	100%	177
Speak Spanish	694	59%	130
Speak Other Indo-European Languages	192	16%	152
Speak Asian-Pacific Island Languages	282	24%	68
Speak Other Languages	0	0%	20
Households by Household Income			
Household Income Base	86,524	100%	390
< $15,000	4,841	6%	225
$15,000 - $25,000	5,043	6%	254
$25,000 - $50,000	14,456	17%	273
$50,000 - $75,000	15,855	18%	305
$75,000 +	46,329	54%	411
Occupied Housing Units by Tenure			
Total	86,524	100%	390
Owner Occupied	62,590	72%	409
Renter Occupied	23,934	28%	338
Employed Population Age 16+ Years			
Total	190,497	100%	1,064
In Labor Force	126,554	66%	709
Civilian Unemployed in Labor Force	6,209	3%	359
Not In Labor Force	63,943	34%	591

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Chesapeake city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	227,168	100%	1,245
English	207,774	91%	1,219
Spanish	9,091	4%	430
French, Haitian, or Cajun	1,519	1%	203
German or other West Germanic	1,207	1%	255
Russian, Polish, or Other Slavic	495	0%	227
Other Indo-European	1,833	1%	271
Korean	376	0%	189
Chinese (including Mandarin, Cantonese)	708	0%	208
Vietnamese	443	0%	228
Tagalog (including Filipino)	1,930	1%	248
Other Asian and Pacific Island	609	0%	122
Arabic	272	0%	120
Other and Unspecified	911	0%	222
Total Non-English	19,394	9%	1,742

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: Franklin County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	93,681
Population Density (per sq. mile)	75
People of Color Population	56,331
% People of Color Population	60%
Households	27,263
Housing Units	28,618
Housing Units Built Before 1950	2,803
Per Capita Income	25,875
Land Area (sq. miles) (Source: SF1)	1,241.60
% Land Area	98%
Water Area (sq. miles) (Source: SF1)	23.36
% Water Area	2%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	93,681	100%	0
Population Reporting One Race	84,398	90%	5,098
White	59,889	64%	2,013
Black	2,222	2%	287
American Indian	1,193	1%	421
Asian	1,984	2%	329
Pacific Islander	205	0%	101
Some Other Race	18,905	20%	1,947
Population Reporting Two or More Races	9,283	10%	1,327
Total Hispanic Population	49,876	53%	0
Total Non-Hispanic Population	43,805		
White Alone	37,350	40%	386
Black Alone	1,725	2%	249
American Indian Alone	220	0%	90
Non-Hispanic Asian Alone	1,848	2%	304
Pacific Islander Alone	145	0%	72
Other Race Alone	360	0%	384
Two or More Races Alone	2,157	2%	449
Population by Sex			
Male	48,239	51%	243
Female	45,442	49%	243
Population by Age			
Age 0-4	8,374	9%	148
Age 0-17	30,430	32%	963
Age 18+	63,251	68%	1,342
Age 65+	8,925	10%	616

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: Franklin County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	54,279	100%	208
Less than 9th Grade	7,606	14%	784
9th - 12th Grade, No Diploma	5,059	9%	679
High School Graduate	13,699	25%	943
Some College, No Degree	12,420	23%	794
Associate Degree	5,210	10%	608
Bachelor's Degree or more	10,285	19%	802
Population Age 5+ Years by Ability to Speak English			
Total	85,307	100%	90
Speak only English	44,747	52%	1,234
Non-English at Home[1+2+3+4]	40,560	48%	1,227
[1]Speak English "very well"	20,252	24%	1,334
[2]Speak English "well"	8,752	10%	922
[3]Speak English "not well"	8,022	9%	766
[4]Speak English "not at all"	3,534	4%	524
[3+4]Speak English "less than well"	11,556	14%	928
[2+3+4]Speak English "less than very well"	20,308	24%	1,308
Linguistically Isolated Households*			
Total	3,318	100%	434
Speak Spanish	2,971	90%	410
Speak Other Indo-European Languages	121	4%	98
Speak Asian-Pacific Island Languages	191	6%	86
Speak Other Languages	35	1%	57
Households by Household Income			
Household Income Base	27,263	100%	307
< $15,000	1,933	7%	389
$15,000 - $25,000	2,017	7%	460
$25,000 - $50,000	5,634	21%	601
$50,000 - $75,000	5,689	21%	656
$75,000 +	11,990	44%	911
Occupied Housing Units by Tenure			
Total	27,263	100%	307
Owner Occupied	18,891	69%	597
Renter Occupied	8,372	31%	603
Employed Population Age 16+ Years			
Total	66,752	100%	275
In Labor Force	44,277	66%	990
Civilian Unemployed in Labor Force	2,502	4%	446
Not In Labor Force	22,475	34%	999

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: Franklin County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	85,307	100%	90
English	44,747	52%	1,478
Spanish	37,856	44%	1,284
French, Haitian, or Cajun	146	0%	39
German or other West Germanic	112	0%	91
Russian, Polish, or Other Slavic	1,110	1%	543
Other Indo-European	54	0%	48
Korean	233	0%	135
Chinese (including Mandarin, Cantonese)	42	0%	54
Vietnamese	265	0%	228
Tagalog (including Filipino)	210	0%	170
Other Asian and Pacific Island	279	0%	205
Arabic	7	0%	15
Other and Unspecified	246	0%	190
Total Non-English	40,560	48%	1,481

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Hampton city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	135,169
Population Density (per sq. mile)	2,627
People of Color Population	84,533
% People of Color Population	63%
Households	54,847
Housing Units	60,145
Housing Units Built Before 1950	6,957
Per Capita Income	31,227
Land Area (sq. miles) (Source: SF1)	51.46
% Land Area	38%
Water Area (sq. miles) (Source: SF1)	84.81
% Water Area	62%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	135,169	100%	1,018
Population Reporting One Race	128,357	95%	2,551
White	54,387	40%	895
Black	67,826	50%	908
American Indian	608	0%	203
Asian	3,123	2%	259
Pacific Islander	228	0%	57
Some Other Race	2,185	2%	229
Population Reporting Two or More Races	6,812	5%	314
Total Hispanic Population	8,208	6%	345
Total Non-Hispanic Population	126,961		
White Alone	50,636	37%	895
Black Alone	66,701	49%	908
American Indian Alone	552	0%	203
Non-Hispanic Asian Alone	3,031	2%	259
Pacific Islander Alone	162	0%	57
Other Race Alone	503	0%	173
Two or More Races Alone	5,376	4%	273
Population by Sex			
Male	65,083	48%	734
Female	70,086	52%	656
Population by Age			
Age 0-4	8,330	6%	269
Age 0-17	28,544	21%	347
Age 18+	106,625	79%	624
Age 65+	20,659	15%	387

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Hampton city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	90,627	100%	682
Less than 9th Grade	2,439	3%	228
9th - 12th Grade, No Diploma	4,965	5%	149
High School Graduate	26,813	30%	601
Some College, No Degree	22,930	25%	377
Associate Degree	9,295	10%	320
Bachelor's Degree or more	24,185	27%	306
Population Age 5+ Years by Ability to Speak English			
Total	126,839	100%	1,011
Speak only English	118,630	94%	917
Non-English at Home[1+2+3+4]	8,209	6%	248
[1]Speak English "very well"	5,787	5%	178
[2]Speak English "well"	1,531	1%	169
[3]Speak English "not well"	777	1%	155
[4]Speak English "not at all"	114	0%	58
[3+4]Speak English "less than well"	891	1%	155
[2+3+4]Speak English "less than very well"	2,422	2%	169
Linguistically Isolated Households*			
Total	394	100%	78
Speak Spanish	197	50%	77
Speak Other Indo-European Languages	29	7%	19
Speak Asian-Pacific Island Languages	168	43%	64
Speak Other Languages	0	0%	13
Households by Household Income			
Household Income Base	54,847	100%	384
< $15,000	6,265	11%	345
$15,000 - $25,000	4,574	8%	165
$25,000 - $50,000	13,079	24%	276
$50,000 - $75,000	11,093	20%	299
$75,000 +	19,836	36%	385
Occupied Housing Units by Tenure			
Total	54,847	100%	384
Owner Occupied	31,233	57%	368
Renter Occupied	23,614	43%	380
Employed Population Age 16+ Years			
Total	109,189	100%	936
In Labor Force	71,181	65%	853
Civilian Unemployed in Labor Force	4,025	4%	328
Not In Labor Force	38,008	35%	724

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Hampton city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	126,839	100%	1,097
English	118,630	94%	1,107
Spanish	4,320	3%	250
French, Haitian, or Cajun	369	0%	83
German or other West Germanic	305	0%	110
Russian, Polish, or Other Slavic	16	0%	18
Other Indo-European	331	0%	83
Korean	467	0%	128
Chinese (including Mandarin, Cantonese)	78	0%	73
Vietnamese	524	0%	233
Tagalog (including Filipino)	602	0%	173
Other Asian and Pacific Island	469	0%	102
Arabic	225	0%	170
Other and Unspecified	503	0%	138
Total Non-English	8,209	6%	1,558

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: Hidalgo County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	861,137
Population Density (per sq. mile)	548
People of Color Population	810,168
% People of Color Population	94%
Households	243,878
Housing Units	281,380
Housing Units Built Before 1950	6,673
Per Capita Income	17,816
Land Area (sq. miles) (Source: SF1)	1,570.96
% Land Area	99%
Water Area (sq. miles) (Source: SF1)	11.87
% Water Area	1%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	861,137	100%	0
Population Reporting One Race	762,656	89%	13,650
White	653,925	76%	7,585
Black	4,838	1%	468
American Indian	1,350	0%	309
Asian	8,453	1%	341
Pacific Islander	277	0%	154
Some Other Race	93,813	11%	4,793
Population Reporting Two or More Races	98,481	11%	5,565
Total Hispanic Population	794,879	92%	0
Total Non-Hispanic Population	66,258		
White Alone	50,969	6%	592
Black Alone	3,816	0%	189
American Indian Alone	624	0%	110
Non-Hispanic Asian Alone	8,114	1%	298
Pacific Islander Alone	202	0%	119
Other Race Alone	1,583	0%	597
Two or More Races Alone	950	0%	326
Population by Sex			
Male	421,929	49%	204
Female	439,208	51%	204
Population by Age			
Age 0-4	76,992	9%	150
Age 0-17	280,998	33%	2,719
Age 18+	580,139	67%	4,351
Age 65+	95,350	11%	2,395

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: Hidalgo County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	485,614	100%	223
Less than 9th Grade	96,557	20%	2,966
9th - 12th Grade, No Diploma	64,036	13%	2,551
High School Graduate	115,900	24%	3,165
Some College, No Degree	90,946	19%	3,044
Associate Degree	24,439	5%	1,403
Bachelor's Degree or more	93,736	19%	2,782
Population Age 5+ Years by Ability to Speak English			
Total	784,145	100%	62
Speak only English	135,617	17%	4,099
Non-English at Home[1+2+3+4]	648,528	83%	4,239
[1]Speak English "very well"	401,314	51%	5,234
[2]Speak English "well"	100,935	13%	3,294
[3]Speak English "not well"	67,682	9%	2,513
[4]Speak English "not at all"	78,597	10%	2,970
[3+4]Speak English "less than well"	146,279	19%	3,890
[2+3+4]Speak English "less than very well"	247,214	32%	5,097
Linguistically Isolated Households*			
Total	48,650	100%	2,225
Speak Spanish	48,088	99%	2,215
Speak Other Indo-European Languages	106	0%	102
Speak Asian-Pacific Island Languages	374	1%	172
Speak Other Languages	82	0%	71
Households by Household Income			
Household Income Base	243,878	100%	1,321
< $15,000	43,859	18%	2,053
$15,000 - $25,000	34,358	14%	1,885
$25,000 - $50,000	60,398	25%	2,296
$50,000 - $75,000	40,492	17%	1,871
$75,000 +	64,771	27%	2,404
Occupied Housing Units by Tenure			
Total	243,878	100%	1,321
Owner Occupied	165,793	68%	2,294
Renter Occupied	78,085	32%	1,980
Employed Population Age 16+ Years			
Total	611,466	100%	946
In Labor Force	357,075	58%	3,407
Civilian Unemployed in Labor Force	26,082	4%	1,884
Not In Labor Force	254,391	42%	3,509

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: Hidalgo County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	784,145	100%	62
English	135,617	17%	4,657
Spanish	639,719	82%	4,844
French, Haitian, or Cajun	361	0%	381
German or other West Germanic	601	0%	277
Russian, Polish, or Other Slavic	70	0%	62
Other Indo-European	1,207	0%	459
Korean	663	0%	321
Chinese (including Mandarin, Cantonese)	416	0%	329
Vietnamese	892	0%	443
Tagalog (including Filipino)	2,186	0%	581
Other Asian and Pacific Island	1,938	0%	653
Arabic	74	0%	61
Other and Unspecified	401	0%	346
Total Non-English	648,528	83%	4,657

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: Isle of Wight County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	37,107
Population Density (per sq. mile)	118
People of Color Population	11,049
% People of Color Population	30%
Households	14,611
Housing Units	15,866
Housing Units Built Before 1950	1,604
Per Capita Income	39,024
Land Area (sq. miles) (Source: SF1)	315.69
% Land Area	87%
Water Area (sq. miles) (Source: SF1)	47.14
% Water Area	13%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	37,107	100%	0
Population Reporting One Race	35,953	97%	1,119
White	26,668	72%	318
Black	8,452	23%	282
American Indian	62	0%	53
Asian	346	1%	96
Pacific Islander	9	0%	14
Some Other Race	416	1%	356
Population Reporting Two or More Races	1,154	3%	288
Total Hispanic Population	1,302	4%	0
Total Non-Hispanic Population	35,805		
White Alone	26,058	70%	27
Black Alone	8,373	23%	256
American Indian Alone	62	0%	53
Non-Hispanic Asian Alone	338	1%	93
Pacific Islander Alone	9	0%	14
Other Race Alone	0	0%	27
Two or More Races Alone	965	3%	265
Population by Sex			
Male	18,226	49%	205
Female	18,881	51%	205
Population by Age			
Age 0-4	1,893	5%	176
Age 0-17	7,803	21%	429
Age 18+	29,304	79%	815
Age 65+	7,036	19%	407

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: Isle of Wight County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	26,652	100%	121
Less than 9th Grade	770	3%	187
9th - 12th Grade, No Diploma	2,193	8%	302
High School Graduate	7,919	30%	627
Some College, No Degree	5,590	21%	447
Associate Degree	2,710	10%	309
Bachelor's Degree or more	7,470	28%	590
Population Age 5+ Years by Ability to Speak English			
Total	35,214	100%	94
Speak only English	33,455	95%	317
Non-English at Home[1+2+3+4]	1,759	5%	306
[1]Speak English "very well"	1,076	3%	301
[2]Speak English "well"	344	1%	131
[3]Speak English "not well"	339	1%	219
[4]Speak English "not at all"	0	0%	27
[3+4]Speak English "less than well"	339	1%	219
[2+3+4]Speak English "less than very well"	683	2%	253
Linguistically Isolated Households*			
Total	179	100%	105
Speak Spanish	138	77%	98
Speak Other Indo-European Languages	0	0%	27
Speak Asian-Pacific Island Languages	41	23%	28
Speak Other Languages	0	0%	27
Households by Household Income			
Household Income Base	14,611	100%	327
< $15,000	926	6%	173
$15,000 - $25,000	1,331	9%	251
$25,000 - $50,000	2,537	17%	354
$50,000 - $75,000	2,220	15%	313
$75,000 +	7,597	52%	558
Occupied Housing Units by Tenure			
Total	14,611	100%	327
Owner Occupied	11,220	77%	463
Renter Occupied	3,391	23%	381
Employed Population Age 16+ Years			
Total	30,367	100%	142
In Labor Force	19,380	64%	519
Civilian Unemployed in Labor Force	1,139	4%	241
Not In Labor Force	10,987	36%	549

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: Isle of Wight County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	35,214	100%	94
English	33,455	95%	348
Spanish	977	3%	201
French, Haitian, or Cajun	35	0%	174
German or other West Germanic	80	0%	60
Russian, Polish, or Other Slavic	112	0%	74
Other Indo-European	238	1%	180
Korean	115	0%	72
Chinese (including Mandarin, Cantonese)	20	0%	28
Vietnamese	0	0%	27
Tagalog (including Filipino)	37	0%	34
Other Asian and Pacific Island	36	0%	29
Arabic	0	0%	27
Other and Unspecified	109	0%	106
Total Non-English	1,759	5%	360

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: James City County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	76,032
Population Density (per sq. mile)	534
People of Color Population	19,153
% People of Color Population	25%
Households	29,681
Housing Units	33,699
Housing Units Built Before 1950	495
Per Capita Income	45,862
Land Area (sq. miles) (Source: SF1)	142.30
% Land Area	79%
Water Area (sq. miles) (Source: SF1)	36.77
% Water Area	21%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	76,032	100%	0
Population Reporting One Race	72,609	95%	1,545
White	60,024	79%	418
Black	9,656	13%	494
American Indian	26	0%	27
Asian	2,163	3%	199
Pacific Islander	12	0%	18
Some Other Race	728	1%	389
Population Reporting Two or More Races	3,423	5%	678
Total Hispanic Population	4,487	6%	0
Total Non-Hispanic Population	71,545		
White Alone	56,879	75%	318
Black Alone	9,524	13%	487
American Indian Alone	26	0%	27
Non-Hispanic Asian Alone	2,160	3%	200
Pacific Islander Alone	12	0%	18
Other Race Alone	411	1%	276
Two or More Races Alone	2,533	3%	562
Population by Sex			
Male	36,489	48%	276
Female	39,543	52%	276
Population by Age			
Age 0-4	3,571	5%	288
Age 0-17	15,028	20%	658
Age 18+	61,004	80%	1,501
Age 65+	19,278	25%	907

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: James City County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	55,499	100%	225
Less than 9th Grade	754	1%	268
9th - 12th Grade, No Diploma	1,774	3%	346
High School Graduate	9,852	18%	830
Some College, No Degree	9,636	17%	807
Associate Degree	5,192	9%	638
Bachelor's Degree or more	28,291	51%	1,172
Population Age 5+ Years by Ability to Speak English			
Total	72,461	100%	0
Speak only English	66,853	92%	576
Non-English at Home[1+2+3+4]	5,608	8%	610
[1]Speak English "very well"	3,791	5%	491
[2]Speak English "well"	1,099	2%	283
[3]Speak English "not well"	478	1%	242
[4]Speak English "not at all"	240	0%	204
[3+4]Speak English "less than well"	718	1%	315
[2+3+4]Speak English "less than very well"	1,817	3%	422
Linguistically Isolated Households*			
Total	391	100%	202
Speak Spanish	232	59%	174
Speak Other Indo-European Languages	49	13%	50
Speak Asian-Pacific Island Languages	65	17%	53
Speak Other Languages	45	12%	73
Households by Household Income			
Household Income Base	29,681	100%	617
< $15,000	1,823	6%	359
$15,000 - $25,000	1,680	6%	370
$25,000 - $50,000	4,327	15%	568
$50,000 - $75,000	4,195	14%	507
$75,000 +	17,656	59%	986
Occupied Housing Units by Tenure			
Total	29,681	100%	617
Owner Occupied	22,709	77%	651
Renter Occupied	6,972	23%	589
Employed Population Age 16+ Years			
Total	62,626	100%	235
In Labor Force	36,602	58%	932
Civilian Unemployed in Labor Force	1,486	2%	296
Not In Labor Force	26,024	42%	881

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: James City County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	72,461	100%	0
English	66,853	92%	664
Spanish	2,339	3%	523
French, Haitian, or Cajun	439	1%	129
German or other West Germanic	468	1%	161
Russian, Polish, or Other Slavic	151	0%	108
Other Indo-European	386	1%	156
Korean	188	0%	104
Chinese (including Mandarin, Cantonese)	346	0%	183
Vietnamese	357	0%	268
Tagalog (including Filipino)	269	0%	181
Other Asian and Pacific Island	280	0%	201
Arabic	241	0%	151
Other and Unspecified	144	0%	96
Total Non-English	5,608	8%	664

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Kennewick city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	82,807
Population Density (per sq. mile)	3,019
People of Color Population	28,994
% People of Color Population	35%
Households	30,318
Housing Units	32,201
Housing Units Built Before 1950	1,924
Per Capita Income	28,935
Land Area (sq. miles) (Source: SF1)	27.43
% Land Area	95%
Water Area (sq. miles) (Source: SF1)	1.42
% Water Area	5%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	82,807	100%	1,028
Population Reporting One Race	78,510	95%	2,243
White	65,376	79%	890
Black	1,584	2%	254
American Indian	1,001	1%	385
Asian	1,987	2%	186
Pacific Islander	18	0%	40
Some Other Race	8,544	10%	488
Population Reporting Two or More Races	4,296	5%	576
Total Hispanic Population	22,865	28%	796
Total Non-Hispanic Population	59,942		
White Alone	53,813	65%	875
Black Alone	1,322	2%	254
American Indian Alone	559	1%	206
Non-Hispanic Asian Alone	1,919	2%	186
Pacific Islander Alone	18	0%	40
Other Race Alone	296	0%	247
Two or More Races Alone	2,014	2%	386
Population by Sex			
Male	41,344	50%	586
Female	41,463	50%	628
Population by Age			
Age 0-4	6,374	8%	351
Age 0-17	22,154	27%	419
Age 18+	60,653	73%	465
Age 65+	12,549	15%	314

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Kennewick city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	53,624	100%	573
Less than 9th Grade	2,708	5%	211
9th - 12th Grade, No Diploma	3,157	6%	160
High School Graduate	14,455	27%	373
Some College, No Degree	13,666	25%	314
Associate Degree	5,396	10%	207
Bachelor's Degree or more	14,243	27%	370
Population Age 5+ Years by Ability to Speak English			
Total	76,433	100%	935
Speak only English	56,507	74%	644
Non-English at Home[1+2+3+4]	19,925	26%	486
[1]Speak English "very well"	12,028	16%	433
[2]Speak English "well"	3,890	5%	245
[3]Speak English "not well"	2,397	3%	252
[4]Speak English "not at all"	1,611	2%	261
[3+4]Speak English "less than well"	4,008	5%	269
[2+3+4]Speak English "less than very well"	7,898	10%	282
Linguistically Isolated Households*			
Total	1,121	100%	130
Speak Spanish	786	70%	129
Speak Other Indo-European Languages	144	13%	89
Speak Asian-Pacific Island Languages	127	11%	68
Speak Other Languages	64	6%	56
Households by Household Income			
Household Income Base	30,318	100%	304
< $15,000	2,649	9%	226
$15,000 - $25,000	2,530	8%	212
$25,000 - $50,000	6,540	22%	261
$50,000 - $75,000	5,781	19%	207
$75,000 +	12,819	42%	296
Occupied Housing Units by Tenure			
Total	30,318	100%	304
Owner Occupied	19,895	66%	295
Renter Occupied	10,424	34%	303
Employed Population Age 16+ Years			
Total	62,809	100%	677
In Labor Force	38,166	61%	439
Civilian Unemployed in Labor Force	2,116	3%	245
Not In Labor Force	24,643	39%	494

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Kennewick city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	74,453	100%	1,007
English	55,320	74%	929
Spanish	15,247	20%	612
French, Haitian, or Cajun	127	0%	154
German or other West Germanic	354	0%	103
Russian, Polish, or Other Slavic	894	1%	348
Other Indo-European	515	1%	195
Korean	0	0%	18
Chinese (including Mandarin, Cantonese)	176	0%	113
Vietnamese	326	0%	162
Tagalog (including Filipino)	253	0%	90
Other Asian and Pacific Island	700	1%	301
Arabic	295	0%	223
Other and Unspecified	245	0%	151
Total Non-English	19,132	26%	1,321

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: Kitsap County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	268,945
Population Density (per sq. mile)	681
People of Color Population	64,460
% People of Color Population	24%
Households	105,758
Housing Units	113,730
Housing Units Built Before 1950	14,957
Per Capita Income	39,993
Land Area (sq. miles) (Source: SF1)	395.10
% Land Area	70%
Water Area (sq. miles) (Source: SF1)	170.73
% Water Area	30%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	268,945	100%	0
Population Reporting One Race	246,504	92%	3,770
White	214,819	80%	1,051
Black	7,060	3%	575
American Indian	2,711	1%	338
Asian	13,125	5%	729
Pacific Islander	2,428	1%	186
Some Other Race	6,361	2%	891
Population Reporting Two or More Races	22,441	8%	1,166
Total Hispanic Population	21,641	8%	0
Total Non-Hispanic Population	247,304		
White Alone	204,485	76%	297
Black Alone	6,716	2%	521
American Indian Alone	2,378	1%	323
Non-Hispanic Asian Alone	12,842	5%	724
Pacific Islander Alone	2,387	1%	178
Other Race Alone	403	0%	214
Two or More Races Alone	18,093	7%	1,059
Population by Sex			
Male	137,586	51%	32
Female	131,359	49%	32
Population by Age			
Age 0-4	15,354	6%	0
Age 0-17	54,803	20%	861
Age 18+	214,142	80%	2,248
Age 65+	48,063	18%	1,387

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: Kitsap County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	188,054	100%	81
Less than 9th Grade	2,859	2%	426
9th - 12th Grade, No Diploma	6,772	4%	623
High School Graduate	40,056	21%	1,442
Some College, No Degree	53,169	28%	1,640
Associate Degree	20,504	11%	983
Bachelor's Degree or more	64,694	34%	1,891
Population Age 5+ Years by Ability to Speak English			
Total	253,591	100%	0
Speak only English	234,503	92%	1,218
Non-English at Home[1+2+3+4]	19,088	8%	1,244
[1]Speak English "very well"	13,318	5%	1,079
[2]Speak English "well"	4,066	2%	485
[3]Speak English "not well"	1,355	1%	328
[4]Speak English "not at all"	349	0%	168
[3+4]Speak English "less than well"	1,704	1%	367
[2+3+4]Speak English "less than very well"	5,770	2%	608
Linguistically Isolated Households*			
Total	1,071	100%	221
Speak Spanish	238	22%	114
Speak Other Indo-European Languages	71	7%	46
Speak Asian-Pacific Island Languages	721	67%	177
Speak Other Languages	41	4%	47
Households by Household Income			
Household Income Base	105,758	100%	938
< $15,000	7,092	7%	565
$15,000 - $25,000	6,125	6%	602
$25,000 - $50,000	17,667	17%	1,023
$50,000 - $75,000	19,283	18%	1,059
$75,000 +	55,591	53%	1,811
Occupied Housing Units by Tenure			
Total	105,758	100%	938
Owner Occupied	72,040	68%	1,205
Renter Occupied	33,718	32%	1,097
Employed Population Age 16+ Years			
Total	220,169	100%	325
In Labor Force	136,216	62%	1,380
Civilian Unemployed in Labor Force	5,341	2%	589
Not In Labor Force	83,953	38%	1,324

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: Kitsap County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	253,591	100%	0
English	234,503	92%	1,349
Spanish	6,418	3%	784
French, Haitian, or Cajun	846	0%	616
German or other West Germanic	868	0%	274
Russian, Polish, or Other Slavic	337	0%	176
Other Indo-European	1,577	1%	647
Korean	469	0%	180
Chinese (including Mandarin, Cantonese)	749	0%	260
Vietnamese	695	0%	564
Tagalog (including Filipino)	4,451	2%	505
Other Asian and Pacific Island	2,334	1%	375
Arabic	64	0%	65
Other and Unspecified	280	0%	179
Total Non-English	19,088	8%	1,349

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Mobile city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	189,259
Population Density (per sq. mile)	1,358
People of Color Population	108,504
% People of Color Population	57%
Households	77,820
Housing Units	92,115
Housing Units Built Before 1950	11,026
Per Capita Income	26,056
Land Area (sq. miles) (Source: SF1)	139.37
% Land Area	77%
Water Area (sq. miles) (Source: SF1)	40.71
% Water Area	23%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	189,259	100%	888
Population Reporting One Race	184,546	98%	2,458
White	83,483	44%	857
Black	95,618	51%	768
American Indian	576	0%	129
Asian	3,326	2%	391
Pacific Islander	32	0%	47
Some Other Race	1,511	1%	266
Population Reporting Two or More Races	4,712	2%	486
Total Hispanic Population	5,106	3%	503
Total Non-Hispanic Population	184,152		
White Alone	80,754	43%	857
Black Alone	95,295	50%	768
American Indian Alone	536	0%	129
Non-Hispanic Asian Alone	3,326	2%	391
Pacific Islander Alone	32	0%	47
Other Race Alone	504	0%	169
Two or More Races Alone	3,705	2%	240
Population by Sex			
Male	88,970	47%	774
Female	100,289	53%	614
Population by Age			
Age 0-4	10,883	6%	370
Age 0-17	40,385	21%	465
Age 18+	148,873	79%	553
Age 65+	31,438	17%	361

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Mobile city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	128,800	100%	648
Less than 9th Grade	2,773	2%	119
9th - 12th Grade, No Diploma	10,807	8%	277
High School Graduate	37,974	29%	352
Some College, No Degree	26,715	21%	286
Associate Degree	10,689	8%	212
Bachelor's Degree or more	39,842	31%	370
Population Age 5+ Years by Ability to Speak English			
Total	178,375	100%	862
Speak only English	170,504	96%	766
Non-English at Home[1+2+3+4]	7,871	4%	414
[1]Speak English "very well"	5,348	3%	414
[2]Speak English "well"	1,660	1%	173
[3]Speak English "not well"	784	0%	119
[4]Speak English "not at all"	79	0%	49
[3+4]Speak English "less than well"	863	0%	119
[2+3+4]Speak English "less than very well"	2,523	1%	173
Linguistically Isolated Households*			
Total	712	100%	85
Speak Spanish	296	42%	84
Speak Other Indo-European Languages	52	7%	18
Speak Asian-Pacific Island Languages	220	31%	77
Speak Other Languages	145	20%	66
Households by Household Income			
Household Income Base	77,820	100%	371
< $15,000	13,051	17%	231
$15,000 - $25,000	10,531	14%	196
$25,000 - $50,000	19,619	25%	373
$50,000 - $75,000	13,140	17%	244
$75,000 +	21,479	28%	305
Occupied Housing Units by Tenure			
Total	77,820	100%	371
Owner Occupied	40,444	52%	291
Renter Occupied	37,376	48%	360
Employed Population Age 16+ Years			
Total	153,357	100%	769
In Labor Force	88,263	58%	665
Civilian Unemployed in Labor Force	5,553	4%	293
Not In Labor Force	65,094	42%	760

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Mobile city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	181,583	100%	924
English	173,450	96%	931
Spanish	3,798	2%	536
French, Haitian, or Cajun	343	0%	125
German or other West Germanic	350	0%	199
Russian, Polish, or Other Slavic	65	0%	47
Other Indo-European	639	0%	161
Korean	213	0%	201
Chinese (including Mandarin, Cantonese)	506	0%	203
Vietnamese	577	0%	156
Tagalog (including Filipino)	283	0%	115
Other Asian and Pacific Island	425	0%	83
Arabic	527	0%	136
Other and Unspecified	407	0%	164
Total Non-English	8,133	4%	1,312

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: Mobile County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	413,977
Population Density (per sq. mile)	337
People of Color Population	180,007
% People of Color Population	43%
Households	157,557
Housing Units	184,321
Housing Units Built Before 1950	15,292
Per Capita Income	26,778
Land Area (sq. miles) (Source: SF1)	1,229.37
% Land Area	75%
Water Area (sq. miles) (Source: SF1)	414.68
% Water Area	25%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	413,977	100%	0
Population Reporting One Race	404,758	98%	3,837
White	240,134	58%	936
Black	149,478	36%	826
American Indian	2,748	1%	394
Asian	7,728	2%	545
Pacific Islander	61	0%	58
Some Other Race	4,609	1%	1,078
Population Reporting Two or More Races	9,219	2%	960
Total Hispanic Population	11,994	3%	0
Total Non-Hispanic Population	401,983		
White Alone	233,970	57%	477
Black Alone	148,460	36%	592
American Indian Alone	2,693	1%	394
Non-Hispanic Asian Alone	7,667	2%	518
Pacific Islander Alone	61	0%	58
Other Race Alone	1,506	0%	668
Two or More Races Alone	7,626	2%	795
Population by Sex			
Male	197,126	48%	181
Female	216,851	52%	181
Population by Age			
Age 0-4	27,182	7%	57
Age 0-17	97,183	23%	1,533
Age 18+	316,794	77%	3,013
Age 65+	67,171	16%	1,662

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: Mobile County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	279,795	100%	112
Less than 9th Grade	7,769	3%	693
9th - 12th Grade, No Diploma	27,758	10%	1,492
High School Graduate	93,840	34%	2,328
Some College, No Degree	58,029	21%	1,858
Associate Degree	24,162	9%	1,382
Bachelor's Degree or more	68,237	24%	2,053
Population Age 5+ Years by Ability to Speak English			
Total	386,795	100%	8
Speak only English	369,769	96%	1,208
Non-English at Home[1+2+3+4]	17,026	4%	1,221
[1]Speak English "very well"	11,262	3%	1,100
[2]Speak English "well"	3,355	1%	512
[3]Speak English "not well"	2,067	1%	412
[4]Speak English "not at all"	342	0%	190
[3+4]Speak English "less than well"	2,409	1%	453
[2+3+4]Speak English "less than very well"	5,764	1%	683
Linguistically Isolated Households*			
Total	1,382	100%	286
Speak Spanish	611	44%	205
Speak Other Indo-European Languages	158	11%	83
Speak Asian-Pacific Island Languages	459	33%	151
Speak Other Languages	154	11%	99
Households by Household Income			
Household Income Base	157,557	100%	1,279
< $15,000	22,289	14%	1,184
$15,000 - $25,000	18,691	12%	1,209
$25,000 - $50,000	38,266	24%	1,795
$50,000 - $75,000	28,803	18%	1,321
$75,000 +	49,508	31%	1,792
Occupied Housing Units by Tenure			
Total	157,557	100%	1,279
Owner Occupied	100,955	64%	1,764
Renter Occupied	56,602	36%	1,863
Employed Population Age 16+ Years			
Total	327,969	100%	454
In Labor Force	186,851	57%	1,999
Civilian Unemployed in Labor Force	10,444	3%	860
Not In Labor Force	141,118	43%	1,961

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: Mobile County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	386,795	100%	8
English	369,769	96%	1,300
Spanish	7,281	2%	840
French, Haitian, or Cajun	504	0%	364
German or other West Germanic	768	0%	277
Russian, Polish, or Other Slavic	297	0%	168
Other Indo-European	1,305	0%	462
Korean	235	0%	205
Chinese (including Mandarin, Cantonese)	684	0%	343
Vietnamese	2,110	1%	555
Tagalog (including Filipino)	413	0%	219
Other Asian and Pacific Island	1,674	0%	345
Arabic	1,287	0%	686
Other and Unspecified	468	0%	235
Total Non-English	17,026	4%	1,300

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Newport News city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	179,582
Population Density (per sq. mile)	2,603
People of Color Population	103,995
% People of Color Population	58%
Households	70,376
Housing Units	77,851
Housing Units Built Before 1950	7,262
Per Capita Income	31,886
Land Area (sq. miles) (Source: SF1)	68.99
% Land Area	58%
Water Area (sq. miles) (Source: SF1)	50.63
% Water Area	42%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	179,582	100%	1,329
Population Reporting One Race	167,606	93%	2,892
White	83,717	47%	648
Black	73,509	41%	1,230
American Indian	496	0%	90
Asian	5,786	3%	294
Pacific Islander	253	0%	120
Some Other Race	3,845	2%	510
Population Reporting Two or More Races	11,976	7%	765
Total Hispanic Population	16,816	9%	547
Total Non-Hispanic Population	162,766		
White Alone	75,587	42%	567
Black Alone	71,917	40%	1,230
American Indian Alone	340	0%	90
Non-Hispanic Asian Alone	5,715	3%	294
Pacific Islander Alone	155	0%	107
Other Race Alone	956	1%	227
Two or More Races Alone	8,096	5%	765
Population by Sex			
Male	86,832	48%	628
Female	92,750	52%	1,001
Population by Age			
Age 0-4	13,148	7%	328
Age 0-17	41,668	23%	582
Age 18+	137,914	77%	579
Age 65+	23,236	13%	354

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Newport News city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	116,686	100%	612
Less than 9th Grade	3,443	3%	229
9th - 12th Grade, No Diploma	6,412	5%	176
High School Graduate	32,875	28%	333
Some College, No Degree	29,389	25%	296
Associate Degree	11,853	10%	291
Bachelor's Degree or more	32,714	28%	367
Population Age 5+ Years by Ability to Speak English			
Total	166,434	100%	1,272
Speak only English	149,484	90%	946
Non-English at Home[1+2+3+4]	16,950	10%	364
[1]Speak English "very well"	11,476	7%	328
[2]Speak English "well"	3,338	2%	215
[3]Speak English "not well"	1,618	1%	192
[4]Speak English "not at all"	518	0%	229
[3+4]Speak English "less than well"	2,136	1%	229
[2+3+4]Speak English "less than very well"	5,474	3%	288
Linguistically Isolated Households*			
Total	1,212	100%	89
Speak Spanish	742	61%	88
Speak Other Indo-European Languages	225	19%	70
Speak Asian-Pacific Island Languages	216	18%	31
Speak Other Languages	29	2%	28
Households by Household Income			
Household Income Base	70,376	100%	378
< $15,000	8,140	12%	184
$15,000 - $25,000	6,729	10%	258
$25,000 - $50,000	17,181	24%	320
$50,000 - $75,000	14,469	21%	339
$75,000 +	23,857	34%	290
Occupied Housing Units by Tenure			
Total	70,376	100%	378
Owner Occupied	34,014	48%	294
Renter Occupied	36,362	52%	378
Employed Population Age 16+ Years			
Total	141,773	100%	858
In Labor Force	95,948	68%	663
Civilian Unemployed in Labor Force	4,959	3%	194
Not In Labor Force	45,825	32%	474

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Newport News city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	166,434	100%	1,312
English	149,484	90%	1,304
Spanish	8,885	5%	504
French, Haitian, or Cajun	921	1%	282
German or other West Germanic	971	1%	174
Russian, Polish, or Other Slavic	395	0%	175
Other Indo-European	1,286	1%	282
Korean	885	1%	112
Chinese (including Mandarin, Cantonese)	289	0%	123
Vietnamese	491	0%	179
Tagalog (including Filipino)	628	0%	92
Other Asian and Pacific Island	944	1%	242
Arabic	622	0%	296
Other and Unspecified	633	0%	170
Total Non-English	16,950	10%	1,850

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Norfolk city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	244,300
Population Density (per sq. mile)	4,586
People of Color Population	139,053
% People of Color Population	57%
Households	89,398
Housing Units	98,142
Housing Units Built Before 1950	25,629
Per Capita Income	30,481
Land Area (sq. miles) (Source: SF1)	53.27
% Land Area	55%
Water Area (sq. miles) (Source: SF1)	43.13
% Water Area	45%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	244,300	100%	1,181
Population Reporting One Race	229,889	94%	2,718
White	113,159	46%	882
Black	99,157	41%	994
American Indian	741	0%	84
Asian	8,960	4%	282
Pacific Islander	184	0%	44
Some Other Race	7,688	3%	432
Population Reporting Two or More Races	14,411	6%	428
Total Hispanic Population	20,452	8%	488
Total Non-Hispanic Population	223,848		
White Alone	105,247	43%	818
Black Alone	97,851	40%	994
American Indian Alone	518	0%	84
Non-Hispanic Asian Alone	8,726	4%	264
Pacific Islander Alone	106	0%	36
Other Race Alone	849	0%	306
Two or More Races Alone	10,551	4%	363
Population by Sex			
Male	127,481	52%	1,044
Female	116,819	48%	636
Population by Age			
Age 0-4	15,938	7%	234
Age 0-17	47,911	20%	383
Age 18+	196,389	80%	1,118
Age 65+	27,349	11%	231

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Norfolk city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	153,359	100%	752
Less than 9th Grade	4,942	3%	183
9th - 12th Grade, No Diploma	13,256	9%	273
High School Graduate	38,061	25%	351
Some College, No Degree	38,261	25%	516
Associate Degree	12,784	8%	231
Bachelor's Degree or more	46,055	30%	358
Population Age 5+ Years by Ability to Speak English			
Total	228,362	100%	1,132
Speak only English	204,064	89%	1,033
Non-English at Home[1+2+3+4]	24,298	11%	501
[1]Speak English "very well"	16,826	7%	488
[2]Speak English "well"	4,011	2%	140
[3]Speak English "not well"	2,491	1%	170
[4]Speak English "not at all"	970	0%	193
[3+4]Speak English "less than well"	3,461	2%	196
[2+3+4]Speak English "less than very well"	7,472	3%	213
Linguistically Isolated Households*			
Total	1,793	100%	126
Speak Spanish	1,018	57%	92
Speak Other Indo-European Languages	236	13%	56
Speak Asian-Pacific Island Languages	534	30%	125
Speak Other Languages	5	0%	20
Households by Household Income			
Household Income Base	89,398	100%	418
< $15,000	11,617	13%	204
$15,000 - $25,000	8,747	10%	136
$25,000 - $50,000	21,519	24%	239
$50,000 - $75,000	17,387	19%	210
$75,000 +	30,128	34%	384
Occupied Housing Units by Tenure			
Total	89,398	100%	418
Owner Occupied	38,853	43%	383
Renter Occupied	50,545	57%	297
Employed Population Age 16+ Years			
Total	200,825	100%	1,145
In Labor Force	142,169	71%	1,108
Civilian Unemployed in Labor Force	9,051	5%	267
Not In Labor Force	58,656	29%	393

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Norfolk city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	228,362	100%	1,311
English	204,064	89%	1,422
Spanish	11,631	5%	412
French, Haitian, or Cajun	1,780	1%	176
German or other West Germanic	652	0%	74
Russian, Polish, or Other Slavic	468	0%	139
Other Indo-European	1,789	1%	176
Korean	413	0%	95
Chinese (including Mandarin, Cantonese)	624	0%	154
Vietnamese	564	0%	139
Tagalog (including Filipino)	3,634	2%	218
Other Asian and Pacific Island	969	0%	162
Arabic	474	0%	64
Other and Unspecified	1,300	1%	145
Total Non-English	24,298	11%	1,934

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Pasco city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	74,323
Population Density (per sq. mile)	2,184
People of Color Population	46,641
% People of Color Population	63%
Households	22,147
Housing Units	23,104
Housing Units Built Before 1950	2,341
Per Capita Income	26,820
Land Area (sq. miles) (Source: SF1)	34.03
% Land Area	91%
Water Area (sq. miles) (Source: SF1)	3.47
% Water Area	9%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	74,323	100%	1,140
Population Reporting One Race	66,093	89%	2,674
White	46,380	62%	914
Black	1,800	2%	203
American Indian	1,037	1%	222
Asian	1,509	2%	481
Pacific Islander	180	0%	68
Some Other Race	15,187	20%	786
Population Reporting Two or More Races	8,230	11%	936
Total Hispanic Population	41,541	56%	1,090
Total Non-Hispanic Population	32,783		
White Alone	27,682	37%	678
Black Alone	1,319	2%	212
American Indian Alone	148	0%	49
Non-Hispanic Asian Alone	1,385	2%	481
Pacific Islander Alone	123	0%	40
Other Race Alone	287	0%	374
Two or More Races Alone	1,838	2%	195
Population by Sex			
Male	37,631	51%	720
Female	36,693	49%	785
Population by Age			
Age 0-4	6,837	9%	337
Age 0-17	24,781	33%	569
Age 18+	49,542	67%	540
Age 65+	6,849	9%	171

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Pasco city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	42,298	100%	609
Less than 9th Grade	5,774	14%	220
9th - 12th Grade, No Diploma	4,178	10%	237
High School Graduate	10,550	25%	294
Some College, No Degree	9,428	22%	254
Associate Degree	3,963	9%	213
Bachelor's Degree or more	8,404	20%	298
Population Age 5+ Years by Ability to Speak English			
Total	67,486	100%	1,051
Speak only English	33,993	50%	793
Non-English at Home[1+2+3+4]	33,494	50%	898
[1]Speak English "very well"	16,912	25%	677
[2]Speak English "well"	7,344	11%	366
[3]Speak English "not well"	6,490	10%	329
[4]Speak English "not at all"	2,748	4%	215
[3+4]Speak English "less than well"	9,238	14%	342
[2+3+4]Speak English "less than very well"	16,582	25%	463
Linguistically Isolated Households*			
Total	2,721	100%	161
Speak Spanish	2,442	90%	152
Speak Other Indo-European Languages	118	4%	73
Speak Asian-Pacific Island Languages	127	5%	52
Speak Other Languages	35	1%	57
Households by Household Income			
Household Income Base	22,147	100%	316
< $15,000	1,729	8%	145
$15,000 - $25,000	1,771	8%	176
$25,000 - $50,000	4,515	20%	172
$50,000 - $75,000	4,653	21%	222
$75,000 +	9,479	43%	305
Occupied Housing Units by Tenure			
Total	22,147	100%	316
Owner Occupied	15,382	69%	305
Renter Occupied	6,765	31%	183
Employed Population Age 16+ Years			
Total	52,293	100%	708
In Labor Force	35,703	68%	581
Civilian Unemployed in Labor Force	1,925	4%	191
Not In Labor Force	16,590	32%	413

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Pasco city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	66,163	100%	1,198
English	32,831	50%	1,020
Spanish	31,037	47%	1,232
French, Haitian, or Cajun	107	0%	27
German or other West Germanic	92	0%	85
Russian, Polish, or Other Slavic	1,075	2%	423
Other Indo-European	52	0%	33
Korean	233	0%	134
Chinese (including Mandarin, Cantonese)	38	0%	48
Vietnamese	218	0%	222
Tagalog (including Filipino)	126	0%	101
Other Asian and Pacific Island	149	0%	161
Arabic	0	0%	18
Other and Unspecified	206	0%	173
Total Non-English	33,332	50%	1,355

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Poquoson city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	12,121
Population Density (per sq. mile)	789
People of Color Population	1,145
% People of Color Population	9%
Households	4,632
Housing Units	4,817
Housing Units Built Before 1950	553
Per Capita Income	37,849
Land Area (sq. miles) (Source: SF1)	15.36
% Land Area	20%
Water Area (sq. miles) (Source: SF1)	63.10
% Water Area	80%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	12,121	100%	395
Population Reporting One Race	11,792	97%	631
White	11,295	93%	395
Black	182	2%	73
American Indian	12	0%	21
Asian	270	2%	91
Pacific Islander	0	0%	13
Some Other Race	33	0%	38
Population Reporting Two or More Races	329	3%	127
Total Hispanic Population	352	3%	94
Total Non-Hispanic Population	11,769		
White Alone	10,976	91%	395
Black Alone	182	2%	73
American Indian Alone	12	0%	21
Non-Hispanic Asian Alone	270	2%	91
Pacific Islander Alone	0	0%	13
Other Race Alone	0	0%	13
Two or More Races Alone	329	3%	127
Population by Sex			
Male	5,971	49%	210
Female	6,150	51%	245
Population by Age			
Age 0-4	544	4%	75
Age 0-17	2,597	21%	181
Age 18+	9,524	79%	258
Age 65+	2,432	20%	129

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Poquoson city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	8,620	100%	282
Less than 9th Grade	143	2%	81
9th - 12th Grade, No Diploma	205	2%	66
High School Graduate	2,014	23%	155
Some College, No Degree	1,731	20%	139
Associate Degree	826	10%	94
Bachelor's Degree or more	3,701	43%	166
Population Age 5+ Years by Ability to Speak English			
Total	11,577	100%	386
Speak only English	11,063	96%	325
Non-English at Home[1+2+3+4]	514	4%	76
[1]Speak English "very well"	399	3%	71
[2]Speak English "well"	101	1%	58
[3]Speak English "not well"	14	0%	26
[4]Speak English "not at all"	0	0%	13
[3+4]Speak English "less than well"	14	0%	26
[2+3+4]Speak English "less than very well"	115	1%	58
Linguistically Isolated Households*			
Total	18	100%	23
Speak Spanish	0	0%	13
Speak Other Indo-European Languages	11	61%	19
Speak Asian-Pacific Island Languages	7	39%	13
Speak Other Languages	0	0%	13
Households by Household Income			
Household Income Base	4,632	100%	168
< $15,000	236	5%	66
$15,000 - $25,000	152	3%	57
$25,000 - $50,000	658	14%	136
$50,000 - $75,000	503	11%	61
$75,000 +	3,083	67%	155
Occupied Housing Units by Tenure			
Total	4,632	100%	168
Owner Occupied	3,792	82%	126
Renter Occupied	840	18%	163
Employed Population Age 16+ Years			
Total	9,945	100%	317
In Labor Force	6,344	64%	306
Civilian Unemployed in Labor Force	106	1%	56
Not In Labor Force	3,601	36%	207

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Poquoson city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	11,577	100%	454
English	11,063	96%	484
Spanish	111	1%	51
French, Haitian, or Cajun	47	0%	31
German or other West Germanic	23	0%	22
Russian, Polish, or Other Slavic	58	1%	81
Other Indo-European	73	1%	46
Korean	0	0%	13
Chinese (including Mandarin, Cantonese)	14	0%	25
Vietnamese	14	0%	22
Tagalog (including Filipino)	25	0%	33
Other Asian and Pacific Island	138	1%	80
Arabic	11	0%	20
Other and Unspecified	0	0%	13
Total Non-English	514	4%	664

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Portsmouth city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	94,961
Population Density (per sq. mile)	2,852
People of Color Population	59,805
% People of Color Population	63%
Households	36,650
Housing Units	40,879
Housing Units Built Before 1950	10,071
Per Capita Income	27,070
Land Area (sq. miles) (Source: SF1)	33.30
% Land Area	71%
Water Area (sq. miles) (Source: SF1)	13.38
% Water Area	29%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	94,961	100%	888
Population Reporting One Race	90,994	96%	2,296
White	36,945	39%	683
Black	49,968	53%	721
American Indian	345	0%	89
Asian	1,511	2%	243
Pacific Islander	342	0%	331
Some Other Race	1,883	2%	229
Population Reporting Two or More Races	3,967	4%	398
Total Hispanic Population	4,427	5%	248
Total Non-Hispanic Population	90,534		
White Alone	35,156	37%	686
Black Alone	49,340	52%	721
American Indian Alone	320	0%	89
Non-Hispanic Asian Alone	1,482	2%	243
Pacific Islander Alone	309	0%	331
Other Race Alone	361	0%	171
Two or More Races Alone	3,566	4%	398
Population by Sex			
Male	45,826	48%	456
Female	49,135	52%	563
Population by Age			
Age 0-4	6,990	7%	271
Age 0-17	22,160	23%	406
Age 18+	72,801	77%	419
Age 65+	13,997	15%	209

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Portsmouth city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	63,775	100%	477
Less than 9th Grade	2,004	3%	149
9th - 12th Grade, No Diploma	4,812	8%	127
High School Graduate	19,523	31%	309
Some College, No Degree	17,933	28%	289
Associate Degree	6,267	10%	266
Bachelor's Degree or more	13,236	21%	228
Population Age 5+ Years by Ability to Speak English			
Total	87,971	100%	856
Speak only English	83,632	95%	768
Non-English at Home[1+2+3+4]	4,339	5%	200
[1]Speak English "very well"	2,672	3%	200
[2]Speak English "well"	1,250	1%	171
[3]Speak English "not well"	388	0%	110
[4]Speak English "not at all"	29	0%	32
[3+4]Speak English "less than well"	417	0%	110
[2+3+4]Speak English "less than very well"	1,667	2%	171
Linguistically Isolated Households*			
Total	392	100%	100
Speak Spanish	286	73%	99
Speak Other Indo-European Languages	14	4%	14
Speak Asian-Pacific Island Languages	91	23%	62
Speak Other Languages	1	0%	13
Households by Household Income			
Household Income Base	36,650	100%	241
< $15,000	4,320	12%	225
$15,000 - $25,000	4,243	12%	169
$25,000 - $50,000	8,792	24%	227
$50,000 - $75,000	7,597	21%	181
$75,000 +	11,698	32%	191
Occupied Housing Units by Tenure			
Total	36,650	100%	241
Owner Occupied	20,257	55%	197
Renter Occupied	16,393	45%	222
Employed Population Age 16+ Years			
Total	75,059	100%	504
In Labor Force	47,632	63%	482
Civilian Unemployed in Labor Force	2,738	4%	134
Not In Labor Force	27,427	37%	323

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Portsmouth city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	87,971	100%	828
English	83,632	95%	861
Spanish	2,509	3%	262
French, Haitian, or Cajun	115	0%	56
German or other West Germanic	124	0%	42
Russian, Polish, or Other Slavic	98	0%	79
Other Indo-European	160	0%	61
Korean	97	0%	64
Chinese (including Mandarin, Cantonese)	101	0%	65
Vietnamese	226	0%	165
Tagalog (including Filipino)	505	1%	126
Other Asian and Pacific Island	201	0%	77
Arabic	84	0%	51
Other and Unspecified	119	0%	69
Total Non-English	4,339	5%	1,170

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Richland city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	57,377
Population Density (per sq. mile)	1,467
People of Color Population	13,088
% People of Color Population	23%
Households	22,450
Housing Units	23,738
Housing Units Built Before 1950	4,663
Per Capita Income	38,293
Land Area (sq. miles) (Source: SF1)	39.12
% Land Area	92%
Water Area (sq. miles) (Source: SF1)	3.50
% Water Area	8%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	57,377	100%	1,037
Population Reporting One Race	53,860	94%	1,797
White	47,981	84%	670
Black	1,101	2%	262
American Indian	231	0%	58
Asian	2,724	5%	549
Pacific Islander	23	0%	25
Some Other Race	1,799	3%	233
Population Reporting Two or More Races	3,518	6%	1,024
Total Hispanic Population	6,720	12%	1,021
Total Non-Hispanic Population	50,657		
White Alone	44,290	77%	665
Black Alone	1,081	2%	262
American Indian Alone	150	0%	46
Non-Hispanic Asian Alone	2,673	5%	549
Pacific Islander Alone	13	0%	25
Other Race Alone	263	0%	233
Two or More Races Alone	2,188	4%	189
Population by Sex			
Male	28,807	50%	947
Female	28,570	50%	379
Population by Age			
Age 0-4	3,878	7%	242
Age 0-17	14,241	25%	477
Age 18+	43,137	75%	393
Age 65+	8,966	16%	186

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Richland city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	38,076	100%	502
Less than 9th Grade	435	1%	123
9th - 12th Grade, No Diploma	763	2%	68
High School Graduate	6,828	18%	219
Some College, No Degree	9,663	25%	218
Associate Degree	3,933	10%	179
Bachelor's Degree or more	16,453	43%	328
Population Age 5+ Years by Ability to Speak English			
Total	53,499	100%	813
Speak only English	46,876	88%	525
Non-English at Home[1+2+3+4]	6,623	12%	355
[1]Speak English "very well"	4,979	9%	289
[2]Speak English "well"	1,075	2%	114
[3]Speak English "not well"	536	1%	162
[4]Speak English "not at all"	34	0%	34
[3+4]Speak English "less than well"	569	1%	162
[2+3+4]Speak English "less than very well"	1,644	3%	177
Linguistically Isolated Households*			
Total	327	100%	67
Speak Spanish	27	8%	23
Speak Other Indo-European Languages	130	40%	47
Speak Asian-Pacific Island Languages	112	34%	38
Speak Other Languages	58	18%	66
Households by Household Income			
Household Income Base	22,450	100%	277
< $15,000	1,415	6%	175
$15,000 - $25,000	1,099	5%	122
$25,000 - $50,000	3,913	17%	169
$50,000 - $75,000	4,322	19%	266
$75,000 +	11,702	52%	214
Occupied Housing Units by Tenure			
Total	22,450	100%	277
Owner Occupied	14,637	65%	214
Renter Occupied	7,813	35%	240
Employed Population Age 16+ Years			
Total	44,644	100%	573
In Labor Force	28,695	64%	446
Civilian Unemployed in Labor Force	1,403	3%	144
Not In Labor Force	15,949	36%	368

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Richland city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	50,183	100%	928
English	43,784	87%	695
Spanish	2,902	6%	299
French, Haitian, or Cajun	113	0%	350
German or other West Germanic	254	1%	71
Russian, Polish, or Other Slavic	643	1%	340
Other Indo-European	1,033	2%	551
Korean	111	0%	78
Chinese (including Mandarin, Cantonese)	401	1%	122
Vietnamese	219	0%	82
Tagalog (including Filipino)	192	0%	105
Other Asian and Pacific Island	216	0%	86
Arabic	188	0%	101
Other and Unspecified	126	0%	103
Total Non-English	6,398	13%	1,159

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Suffolk city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	91,383
Population Density (per sq. mile)	229
People of Color Population	46,677
% People of Color Population	51%
Households	34,603
Housing Units	37,394
Housing Units Built Before 1950	4,047
Per Capita Income	38,756
Land Area (sq. miles) (Source: SF1)	399.16
% Land Area	93%
Water Area (sq. miles) (Source: SF1)	29.75
% Water Area	7%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	91,383	100%	913
Population Reporting One Race	87,240	95%	1,902
White	46,250	51%	649
Black	37,869	41%	755
American Indian	153	0%	48
Asian	1,956	2%	247
Pacific Islander	9	0%	18
Some Other Race	1,003	1%	185
Population Reporting Two or More Races	4,143	5%	271
Total Hispanic Population	4,098	4%	302
Total Non-Hispanic Population	87,285		
White Alone	44,706	49%	650
Black Alone	37,218	41%	755
American Indian Alone	127	0%	48
Non-Hispanic Asian Alone	1,892	2%	247
Pacific Islander Alone	9	0%	18
Other Race Alone	204	0%	147
Two or More Races Alone	3,129	3%	271
Population by Sex			
Male	44,185	48%	559
Female	47,198	52%	571
Population by Age			
Age 0-4	6,002	7%	228
Age 0-17	22,025	24%	411
Age 18+	69,358	76%	549
Age 65+	13,209	14%	179

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Suffolk city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	62,050	100%	665
Less than 9th Grade	2,118	3%	205
9th - 12th Grade, No Diploma	3,930	6%	191
High School Graduate	16,132	26%	265
Some College, No Degree	15,833	26%	421
Associate Degree	5,648	9%	165
Bachelor's Degree or more	18,389	30%	344
Population Age 5+ Years by Ability to Speak English			
Total	85,381	100%	896
Speak only English	80,656	94%	710
Non-English at Home[1+2+3+4]	4,725	6%	276
[1]Speak English "very well"	3,560	4%	266
[2]Speak English "well"	612	1%	83
[3]Speak English "not well"	426	0%	111
[4]Speak English "not at all"	127	0%	50
[3+4]Speak English "less than well"	553	1%	111
[2+3+4]Speak English "less than very well"	1,165	1%	111
Linguistically Isolated Households*			
Total	200	100%	57
Speak Spanish	72	36%	56
Speak Other Indo-European Languages	7	4%	18
Speak Asian-Pacific Island Languages	96	48%	39
Speak Other Languages	25	13%	29
Households by Household Income			
Household Income Base	34,603	100%	302
< $15,000	2,688	8%	138
$15,000 - $25,000	2,602	8%	183
$25,000 - $50,000	5,581	16%	183
$50,000 - $75,000	5,500	16%	211
$75,000 +	18,232	53%	339
Occupied Housing Units by Tenure			
Total	34,603	100%	302
Owner Occupied	24,341	70%	292
Renter Occupied	10,262	30%	217
Employed Population Age 16+ Years			
Total	71,731	100%	776
In Labor Force	48,380	67%	701
Civilian Unemployed in Labor Force	2,881	4%	171
Not In Labor Force	23,351	33%	404

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Suffolk city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	85,381	100%	896
English	80,656	94%	869
Spanish	2,019	2%	293
French, Haitian, or Cajun	289	0%	237
German or other West Germanic	365	0%	178
Russian, Polish, or Other Slavic	49	0%	28
Other Indo-European	892	1%	237
Korean	100	0%	57
Chinese (including Mandarin, Cantonese)	116	0%	96
Vietnamese	237	0%	132
Tagalog (including Filipino)	281	0%	118
Other Asian and Pacific Island	145	0%	84
Arabic	43	0%	51
Other and Unspecified	189	0%	188
Total Non-English	4,725	6%	1,232

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: Surry County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	6,459
Population Density (per sq. mile)	23
People of Color Population	3,047
% People of Color Population	47%
Households	2,794
Housing Units	3,600
Housing Units Built Before 1950	641
Per Capita Income	31,136
Land Area (sq. miles) (Source: SF1)	278.95
% Land Area	90%
Water Area (sq. miles) (Source: SF1)	31.36
% Water Area	10%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	6,459	100%	0
Population Reporting One Race	6,350	98%	158
White	3,561	55%	41
Black	2,786	43%	58
American Indian	3	0%	5
Asian	0	0%	18
Pacific Islander	0	0%	18
Some Other Race	0	0%	18
Population Reporting Two or More Races	109	2%	74
Total Hispanic Population	169	3%	0
Total Non-Hispanic Population	6,290		
White Alone	3,412	53%	18
Black Alone	2,786	43%	58
American Indian Alone	3	0%	5
Non-Hispanic Asian Alone	0	0%	18
Pacific Islander Alone	0	0%	18
Other Race Alone	0	0%	18
Two or More Races Alone	89	1%	58
Population by Sex			
Male	3,103	48%	48
Female	3,356	52%	48
Population by Age			
Age 0-4	295	5%	41
Age 0-17	1,146	18%	111
Age 18+	5,313	82%	307
Age 65+	1,439	22%	156

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: Surry County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	4,929	100%	91
Less than 9th Grade	270	5%	103
9th - 12th Grade, No Diploma	497	10%	141
High School Graduate	1,678	34%	198
Some College, No Degree	1,166	24%	201
Associate Degree	313	6%	94
Bachelor's Degree or more	1,005	20%	176
Population Age 5+ Years by Ability to Speak English			
Total	6,164	100%	14
Speak only English	6,040	98%	78
Non-English at Home[1+2+3+4]	124	2%	62
[1]Speak English "very well"	120	2%	62
[2]Speak English "well"	4	0%	20
[3]Speak English "not well"	0	0%	18
[4]Speak English "not at all"	0	0%	18
[3+4]Speak English "less than well"	0	0%	18
[2+3+4]Speak English "less than very well"	4	0%	20
Linguistically Isolated Households*			
Total	0	0%	18
Speak Spanish	0	0%	18
Speak Other Indo-European Languages	0	0%	18
Speak Asian-Pacific Island Languages	0	0%	18
Speak Other Languages	0	0%	18
Households by Household Income			
Household Income Base	2,794	100%	183
< $15,000	220	8%	81
$15,000 - $25,000	465	17%	159
$25,000 - $50,000	553	20%	123
$50,000 - $75,000	463	17%	113
$75,000 +	1,093	39%	171
Occupied Housing Units by Tenure			
Total	2,794	100%	183
Owner Occupied	2,014	72%	183
Renter Occupied	780	28%	155
Employed Population Age 16+ Years			
Total	5,424	100%	78
In Labor Force	3,201	59%	229
Civilian Unemployed in Labor Force	151	3%	79
Not In Labor Force	2,223	41%	235

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: Surry County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	6,164	100%	14
English	6,040	98%	79
Spanish	101	2%	59
French, Haitian, or Cajun	0	0%	18
German or other West Germanic	14	0%	16
Russian, Polish, or Other Slavic	0	0%	18
Other Indo-European	0	0%	18
Korean	0	0%	18
Chinese (including Mandarin, Cantonese)	0	0%	18
Vietnamese	0	0%	18
Tagalog (including Filipino)	0	0%	18
Other Asian and Pacific Island	0	0%	18
Arabic	0	0%	18
Other and Unspecified	9	0%	15
Total Non-English	124	2%	80

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Virginia Beach city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	450,882
Population Density (per sq. mile)	1,842
People of Color Population	175,611
% People of Color Population	39%
Households	172,452
Housing Units	185,735
Housing Units Built Before 1950	4,393
Per Capita Income	40,241
Land Area (sq. miles) (Source: SF1)	244.72
% Land Area	49%
Water Area (sq. miles) (Source: SF1)	252.78
% Water Area	51%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	450,882	100%	1,539
Population Reporting One Race	421,503	93%	3,705
White	293,359	65%	1,192
Black	84,851	19%	1,308
American Indian	1,238	0%	169
Asian	32,057	7%	448
Pacific Islander	454	0%	143
Some Other Race	9,544	2%	445
Population Reporting Two or More Races	29,379	7%	1,117
Total Hispanic Population	37,894	8%	892
Total Non-Hispanic Population	412,988		
White Alone	275,271	61%	1,194
Black Alone	82,565	18%	1,308
American Indian Alone	829	0%	169
Non-Hispanic Asian Alone	31,447	7%	448
Pacific Islander Alone	387	0%	143
Other Race Alone	1,118	0%	258
Two or More Races Alone	21,371	5%	545
Population by Sex			
Male	221,526	49%	751
Female	229,356	51%	1,059
Population by Age			
Age 0-4	28,327	6%	419
Age 0-17	99,896	22%	623
Age 18+	350,986	78%	880
Age 65+	63,991	14%	458

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Virginia Beach city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	309,067	100%	1,029
Less than 9th Grade	5,359	2%	168
9th - 12th Grade, No Diploma	13,095	4%	455
High School Graduate	64,167	21%	423
Some College, No Degree	76,736	25%	388
Associate Degree	34,519	11%	363
Bachelor's Degree or more	115,191	37%	579
Population Age 5+ Years by Ability to Speak English			
Total	422,555	100%	1,321
Speak only English	369,978	88%	1,083
Non-English at Home[1+2+3+4]	52,577	12%	689
[1]Speak English "very well"	36,158	9%	541
[2]Speak English "well"	10,820	3%	252
[3]Speak English "not well"	4,773	1%	445
[4]Speak English "not at all"	826	0%	163
[3+4]Speak English "less than well"	5,599	1%	445
[2+3+4]Speak English "less than very well"	16,419	4%	447
Linguistically Isolated Households*			
Total	3,190	100%	231
Speak Spanish	1,046	33%	154
Speak Other Indo-European Languages	423	13%	78
Speak Asian-Pacific Island Languages	1,669	52%	230
Speak Other Languages	52	2%	51
Households by Household Income			
Household Income Base	172,452	100%	570
< $15,000	9,247	5%	244
$15,000 - $25,000	8,885	5%	362
$25,000 - $50,000	31,575	18%	518
$50,000 - $75,000	32,979	19%	336
$75,000 +	89,766	52%	458
Occupied Housing Units by Tenure			
Total	172,452	100%	570
Owner Occupied	111,517	65%	428
Renter Occupied	60,935	35%	564
Employed Population Age 16+ Years			
Total	362,268	100%	1,012
In Labor Force	255,218	70%	905
Civilian Unemployed in Labor Force	10,224	3%	479
Not In Labor Force	107,050	30%	705

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Virginia Beach city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	422,555	100%	1,321
English	369,978	88%	1,313
Spanish	20,312	5%	493
French, Haitian, or Cajun	1,586	0%	656
German or other West Germanic	1,294	0%	246
Russian, Polish, or Other Slavic	1,347	0%	182
Other Indo-European	5,271	1%	806
Korean	468	0%	79
Chinese (including Mandarin, Cantonese)	2,713	1%	392
Vietnamese	1,998	0%	402
Tagalog (including Filipino)	12,407	3%	341
Other Asian and Pacific Island	3,104	1%	396
Arabic	644	0%	270
Other and Unspecified	1,433	0%	296
Total Non-English	52,577	12%	1,863

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: Willacy County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	21,419
Population Density (per sq. mile)	36
People of Color Population	19,142
% People of Color Population	89%
Households	5,882
Housing Units	7,391
Housing Units Built Before 1950	950
Per Capita Income	18,244
Land Area (sq. miles) (Source: SF1)	590.60
% Land Area	75%
Water Area (sq. miles) (Source: SF1)	194.16
% Water Area	25%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	21,419	100%	0
Population Reporting One Race	19,129	89%	1,296
White	18,457	86%	819
Black	183	1%	94
American Indian	164	1%	149
Asian	0	0%	26
Pacific Islander	0	0%	26
Some Other Race	325	2%	182
Population Reporting Two or More Races	2,290	11%	831
Total Hispanic Population	18,888	88%	0
Total Non-Hispanic Population	2,531		
White Alone	2,277	11%	133
Black Alone	154	1%	84
American Indian Alone	0	0%	26
Non-Hispanic Asian Alone	0	0%	26
Pacific Islander Alone	0	0%	26
Other Race Alone	0	0%	26
Two or More Races Alone	100	0%	99
Population by Sex			
Male	11,802	55%	35
Female	9,617	45%	35
Population by Age			
Age 0-4	1,367	6%	41
Age 0-17	5,096	24%	275
Age 18+	16,323	76%	637
Age 65+	3,009	14%	266

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: Willacy County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	13,532	100%	183
Less than 9th Grade	2,290	17%	289
9th - 12th Grade, No Diploma	1,760	13%	314
High School Graduate	5,030	37%	502
Some College, No Degree	2,419	18%	394
Associate Degree	787	6%	215
Bachelor's Degree or more	1,246	9%	222
Population Age 5+ Years by Ability to Speak English			
Total	20,052	100%	32
Speak only English	7,565	38%	617
Non-English at Home[1+2+3+4]	12,487	62%	617
[1]Speak English "very well"	8,905	44%	621
[2]Speak English "well"	2,023	10%	368
[3]Speak English "not well"	989	5%	235
[4]Speak English "not at all"	570	3%	172
[3+4]Speak English "less than well"	1,559	8%	290
[2+3+4]Speak English "less than very well"	3,582	18%	468
Linguistically Isolated Households*			
Total	836	100%	159
Speak Spanish	836	100%	157
Speak Other Indo-European Languages	0	0%	26
Speak Asian-Pacific Island Languages	0	0%	26
Speak Other Languages	0	0%	26
Households by Household Income			
Household Income Base	5,882	100%	226
< $15,000	1,173	20%	220
$15,000 - $25,000	810	14%	222
$25,000 - $50,000	1,483	25%	256
$50,000 - $75,000	971	17%	214
$75,000 +	1,445	25%	315
Occupied Housing Units by Tenure			
Total	5,882	100%	226
Owner Occupied	3,939	67%	337
Renter Occupied	1,943	33%	318
Employed Population Age 16+ Years			
Total	16,831	100%	76
In Labor Force	9,395	56%	482
Civilian Unemployed in Labor Force	981	6%	282
Not In Labor Force	7,436	44%	495

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: Willacy County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	20,052	100%	32
English	7,565	38%	715
Spanish	12,463	62%	719
French, Haitian, or Cajun	14	0%	26
German or other West Germanic	0	0%	26
Russian, Polish, or Other Slavic	0	0%	26
Other Indo-European	0	0%	26
Korean	0	0%	26
Chinese (including Mandarin, Cantonese)	0	0%	26
Vietnamese	0	0%	26
Tagalog (including Filipino)	0	0%	26
Other Asian and Pacific Island	0	0%	26
Arabic	0	0%	26
Other and Unspecified	10	0%	18
Total Non-English	12,487	62%	716

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: City: Williamsburg city
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	15,034
Population Density (per sq. mile)	1,682
People of Color Population	4,820
% People of Color Population	32%
Households	4,485
Housing Units	5,271
Housing Units Built Before 1950	419
Per Capita Income	39,116
Land Area (sq. miles) (Source: SF1)	8.94
% Land Area	98%
Water Area (sq. miles) (Source: SF1)	0.16
% Water Area	2%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	15,034	100%	541
Population Reporting One Race	14,207	94%	1,037
White	10,773	72%	495
Black	2,285	15%	262
American Indian	36	0%	62
Asian	997	7%	122
Pacific Islander	0	0%	18
Some Other Race	116	1%	78
Population Reporting Two or More Races	827	6%	300
Total Hispanic Population	1,085	7%	289
Total Non-Hispanic Population	13,949		
White Alone	10,214	68%	449
Black Alone	2,285	15%	262
American Indian Alone	36	0%	62
Non-Hispanic Asian Alone	997	7%	122
Pacific Islander Alone	0	0%	18
Other Race Alone	24	0%	30
Two or More Races Alone	393	3%	121
Population by Sex			
Male	7,015	47%	289
Female	8,019	53%	386
Population by Age			
Age 0-4	476	3%	84
Age 0-17	1,661	11%	182
Age 18+	13,373	89%	490
Age 65+	2,417	16%	183

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: City: Williamsburg city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	7,690	100%	335
Less than 9th Grade	200	3%	108
9th - 12th Grade, No Diploma	322	4%	80
High School Graduate	1,498	19%	215
Some College, No Degree	1,200	16%	169
Associate Degree	577	8%	134
Bachelor's Degree or more	3,893	51%	174
Population Age 5+ Years by Ability to Speak English			
Total	14,558	100%	520
Speak only English	12,472	86%	459
Non-English at Home[1+2+3+4]	2,086	14%	260
[1]Speak English "very well"	1,727	12%	210
[2]Speak English "well"	149	1%	43
[3]Speak English "not well"	210	1%	152
[4]Speak English "not at all"	0	0%	18
[3+4]Speak English "less than well"	210	1%	152
[2+3+4]Speak English "less than very well"	359	2%	153
Linguistically Isolated Households*			
Total	64	100%	28
Speak Spanish	18	28%	18
Speak Other Indo-European Languages	17	27%	20
Speak Asian-Pacific Island Languages	29	45%	22
Speak Other Languages	0	0%	18
Households by Household Income			
Household Income Base	4,485	100%	217
< $15,000	371	8%	53
$15,000 - $25,000	548	12%	164
$25,000 - $50,000	913	20%	111
$50,000 - $75,000	780	17%	78
$75,000 +	1,873	42%	128
Occupied Housing Units by Tenure			
Total	4,485	100%	217
Owner Occupied	2,340	52%	144
Renter Occupied	2,145	48%	200
Employed Population Age 16+ Years			
Total	13,704	100%	507
In Labor Force	6,918	50%	338
Civilian Unemployed in Labor Force	355	3%	93
Not In Labor Force	6,786	50%	299

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: City: Williamsburg city
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	14,558	100%	441
English	12,472	86%	467
Spanish	635	4%	284
French, Haitian, or Cajun	187	1%	73
German or other West Germanic	49	0%	29
Russian, Polish, or Other Slavic	81	1%	43
Other Indo-European	209	1%	83
Korean	100	1%	51
Chinese (including Mandarin, Cantonese)	385	3%	92
Vietnamese	33	0%	38
Tagalog (including Filipino)	8	0%	18
Other Asian and Pacific Island	65	0%	44
Arabic	139	1%	93
Other and Unspecified	195	1%	156
Total Non-English	2,086	14%	642

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN ACS Summary Report

Location: York County
Ring (buffer): 0-mile radius
Description:

Summary of ACS Estimates	2016 - 2020
Population	68,389
Population Density (per sq. mile)	653
People of Color Population	20,553
% People of Color Population	30%
Households	25,517
Housing Units	28,114
Housing Units Built Before 1950	603
Per Capita Income	41,994
Land Area (sq. miles) (Source: SF1)	104.71
% Land Area	49%
Water Area (sq. miles) (Source: SF1)	110.28
% Water Area	51%

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	68,389	100%	0
Population Reporting One Race	64,243	94%	1,899
White	50,196	73%	416
Black	9,005	13%	518
American Indian	136	0%	129
Asian	3,930	6%	338
Pacific Islander	199	0%	263
Some Other Race	777	1%	235
Population Reporting Two or More Races	4,146	6%	643
Total Hispanic Population	4,618	7%	0
Total Non-Hispanic Population	63,771		
White Alone	47,836	70%	191
Black Alone	8,916	13%	490
American Indian Alone	98	0%	117
Non-Hispanic Asian Alone	3,841	6%	320
Pacific Islander Alone	171	0%	260
Other Race Alone	194	0%	166
Two or More Races Alone	2,715	4%	575
Population by Sex			
Male	33,527	49%	214
Female	34,862	51%	214
Population by Age			
Age 0-4	3,771	6%	105
Age 0-17	16,176	24%	614
Age 18+	52,213	76%	1,195
Age 65+	11,075	16%	656

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020 .

EJSCREEN ACS Summary Report

Location: York County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	46,245	100%	251
Less than 9th Grade	787	2%	197
9th - 12th Grade, No Diploma	1,411	3%	290
High School Graduate	8,062	17%	675
Some College, No Degree	8,392	18%	621
Associate Degree	4,694	10%	498
Bachelor's Degree or more	22,899	50%	1,056
Population Age 5+ Years by Ability to Speak English			
Total	64,618	100%	5
Speak only English	57,585	89%	589
Non-English at Home[1+2+3+4]	7,033	11%	639
[1]Speak English "very well"	4,768	7%	529
[2]Speak English "well"	1,425	2%	333
[3]Speak English "not well"	592	1%	234
[4]Speak English "not at all"	248	0%	159
[3+4]Speak English "less than well"	840	1%	281
[2+3+4]Speak English "less than very well"	2,265	4%	435
Linguistically Isolated Households*			
Total	343	100%	132
Speak Spanish	46	13%	49
Speak Other Indo-European Languages	140	41%	77
Speak Asian-Pacific Island Languages	157	46%	91
Speak Other Languages	0	0%	30
Households by Household Income			
Household Income Base	25,517	100%	347
< $15,000	1,161	5%	267
$15,000 - $25,000	918	4%	205
$25,000 - $50,000	3,548	14%	468
$50,000 - $75,000	4,154	16%	475
$75,000 +	15,736	62%	958
Occupied Housing Units by Tenure			
Total	25,517	100%	347
Owner Occupied	18,383	72%	521
Renter Occupied	7,134	28%	521
Employed Population Age 16+ Years			
Total	54,100	100%	170
In Labor Force	36,088	67%	692
Civilian Unemployed in Labor Force	1,672	3%	405
Not In Labor Force	18,012	33%	716

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: York County
Ring (buffer): 0-mile radius
Description:

	2016 - 2020 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	64,618	100%	5
English	57,585	89%	633
Spanish	2,546	4%	426
French, Haitian, or Cajun	274	0%	282
German or other West Germanic	505	1%	201
Russian, Polish, or Other Slavic	212	0%	118
Other Indo-European	951	1%	343
Korean	567	1%	265
Chinese (including Mandarin, Cantonese)	832	1%	465
Vietnamese	160	0%	125
Tagalog (including Filipino)	240	0%	100
Other Asian and Pacific Island	434	1%	180
Arabic	46	0%	59
Other and Unspecified	266	0%	208
Total Non-English	7,033	11%	633

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2016 - 2020.
*Population by Language Spoken at Home is available at the census tract summary level and up.

Environmental Impact Statement/
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Appendix H ESA-Listed Species at Virginia, Alabama, Texas, and Washington Port Locations and Along Transportation Routes

H.1 Overview

In support of this Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS), the United States (U.S.) Department of Navy (Navy) completed a literature review to accurately describe biological resources potentially impacted by the Proposed Action. This appendix describes the process of identifying Endangered Species Act (ESA)-listed species that may potentially be affected by the Proposed Action and lists these species in Table H-1.

Species that are described in more detail in Section 3.5 (Biological Resources) are species that are known to occur (or may have the potential to occur) within the origin and destination port locations analyzed in this Environmental Impact Statement/Overseas Environmental Impact Statement (see Table 3.5-1). These species are indicated in bold in Table H-1.

The Navy has completed prior consultations with the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) for some activities as part of the Proposed Action. Species listed in Table H-1 that are not presented in boldface are not analyzed in detail because (1) they were analyzed previously, and (2) they may occur in the general area of elements of the Proposed Action, but those elements would be part of normal facility or transportation operations and effects would not exceed impacts above the existing baseline.

Some of the species with federal ESA-listing status identified in Table H-1 are also afforded protections under individual states' laws and authorities. The impact analyses for these species and protective measures included in consultations with NMFS or USFWS are applicable to these species.

H.2 Endangered Species Act-Listed Species at Project Areas

Table H-1 provides a list of ESA-listed species that are known to occur, or have the potential to occur, at shipyard locations in Virginia (Hampton Roads Metropolitan Area), Alabama (Port of Mobile), Texas (Port of Brownsville), and Washington (Puget Sound Naval Shipyard and Intermediate Maintenance Facility [PSNS & IMF]), as well as the Port of Benton barge slip in Richland, Washington. ESA-listed species that may occur along transportation routes are also included in the table.

To compile a list of ESA-listed species, the Navy reviewed available documentation relevant to each port location and transit route described in Section 2.1 (Proposed Action). Sources of information include National Environmental Policy Act documentation, Integrated Natural Resource Management Plan documents (relevant only to Department of Defense-owned and managed properties) and other natural resource management plans, section 7 ESA consultation documentation from consultations between the Navy (and other federal agencies) and NMFS or USFWS, technical surveys for flora and fauna specific to Project Areas, and other literature available through academic research institutions. These descriptions are included in Section 3.5.2 (Affected Environment).

H.3 Endangered Species Act-Listed Species Along Transportation Routes

Species that likely occur along transportation routes (such as the tow routes proposed for the ex-Enterprise to dismantlement ports, heavy-lift ship routes for propulsion space section transport, and the barge route from PSNS & IMF to the Port of Benton barge slip) are listed in Table H-1. To construct these lists, the Navy conducted a detailed review of the following consultations:

2019 NMFS Programmatic Biological Opinion. In 2019, NMFS issued the Programmatic Biological and Conference Opinion on the Towing of Inactive U.S. Navy Ships from their Existing Berths to Dismantling Facilities or other Inactive Ship Site (NMFS, 2019). In this consultation, NMFS evaluated towing of inactive Navy ships from several origin and destination ports. Potential effects to ESA-listed species resulting from dismantlement activities at destination ports were also analyzed in the 2019 NMFS Programmatic Biological Opinion. NMFS concluded that the towing of inactive Navy ships and their dismantlement would not likely adversely affect ESA-listed species potentially occurring at Norfolk Naval Shipyard, Port of Brownsville, or PSNS & IMF. Newport News Shipbuilding (located in the Hampton Roads Metropolitan Area, Virginia) and the Port of Mobile, Alabama, were not analyzed in this Programmatic Biological Opinion. Some species analyzed in the 2019 NMFS Programmatic Biological Opinion do not overlap with the shipyard facilities or transportation routes. These species include the Hawaiian monk seal (*Neomonachus schauinslandi*), black abalone (*Haliotis cracherodii*), and white abalone (*Haliotis sorenseni*). The Hawaiian monk seal occurs in nearshore and coastal waters of Hawaii, which is outside any of the transportation routes analyzed in this EIS/OEIS. Black and white abalone occur in shallow waters along the Californian coast, which would not overlap with transportation routes for the heavy-lift ship up the coastline. The 2019 NMFS Programmatic Biological Opinion also analyzed potential impacts on the Gulf of Mexico Bryde's whale (*Balaenoptera edeni*). At the time of publication, this species was proposed for ESA listing. This species has since gone through a taxonomic revision and is now named Rice's whale (*Balaenoptera ricei*) (Rosel et al., 2021), and is listed in Table H-1 as such.

Informal Consultations with USFWS Regarding Inactive Ship Towing and Dismantlement. Parallel with Navy obligations to consult with NMFS under section 7 of the ESA, the Navy also consulted with USFWS Ecological Services Field Offices for potential effects to ESA-listed species under the management of the USFWS. In 2018, the Navy requested concurrence from the USFWS that towing and dismantlement of inactive Navy ships would not adversely affect the Florida subspecies of the West Indian manatee (*Trichechus manatus latirostris*). The ports analyzed in this request included Mayport, Florida; New Orleans, Louisiana; and Beaumont, Texas. The Louisiana Ecological Services Field Office concurred with the Navy determination that manatees would not be adversely affected, citing slow ship speeds as not presenting a likely strike risk, and that ship sound would not cause discernable impacts (USFWS, 2018). In 2019, the Navy requested a concurrence from USFWS for towing and dismantling inactive ships at PSNS & IMF and their potential effects on the ESA-listed bull trout (USFWS, 2019). In response, USFWS provided a letter of concurrence to the Navy, agreeing that the proposed activities would not likely adversely affect the bull trout. Informal consultations with USFWS have been completed for inactive ship towing and dismantlement at a shipyard facility within the Hampton Roads Metropolitan Area, Virginia, or the Port of Mobile, Alabama. Accordingly, the Navy has consulted with USFWS for species under their jurisdiction if the Preferred Alternative (Alternative 3) includes activities that may affect species at these locations.

Previous Consultations at PSNS & IMF. PSNS & IMF has consulted with USFWS for dry dock operations, such as for flooding and draining of dry docks to dock and re-float ships. PSNS & IMF has also consulted on pile replacement and maintenance activities. The current operating permit for dry dock activities was renewed in January 2021 (NMFS, 2021).

Consultations for the Port of Benton Barge Slip Improvements. In 2018, U.S. Army Corps of Engineers Walla Walla began early coordination with NMFS and USFWS regarding potential impacts of barge slip improvements at the Port of Benton barge slip modification area.

Table H-1: ESA-Listed Species at Project Areas and Along Transportation Routes

Common Name[1]	Scientific Name	Distinct Population Segment (DPS)[2]/ Evolutionarily Significant Unit (ESU)[3]	Status	Portion of the Study Area[4]							
				Virginia	Alabama	Texas	Washington		Towing Route[5]	Heavy Lift Ship Route[6]	Barge Route[7]
				Hampton Roads Metropolitan Area	Port of Mobile	Port of Brownsville	PSNS & IMF	Port of Benton			
Marine Mammals											
Blue Whale[11]	*Balaenoptera musculus*	-	Endangered						x	x	x
Sei Whale[11]	*Balaenoptera borealis*	-	Endangered						x	x	x
Fin Whale[11]	*Balaenoptera physalus*	-	Endangered						x	x	x
Rice's Whale[11]	*Balaenoptera ricei*	-	Endangered						x	x	
North Atlantic Right Whale[11]	*Eubalaena glacialis*	-	Endangered						x	x	
North Pacific Right Whale	*Eubalaena japonica*	-	Endangered							x	x
Southern Right Whale	*Eubalaena australis*	-	Endangered							x	
Humpback Whale	***Megaptera novaeangliae***	**Central America DPS**	**Endangered**				**x**		**x**	**x**	**x**
		Mexico DPS	**Threatened**				**x**		**x**	**x**	**x**
False Killer Whale	*Pseudorca crassidens*	Main Hawaiian Islands Insular DPS	Endangered							x	
Killer Whale	***Orcinus orca***	**Southern Resident DPS**	**Endangered**				**x**		**x**	**x**	**x**
Sperm Whale[11]	*Physeter macrocephalus*	-	Endangered						x	x	x
Guadalupe Fur Seal	*Arctocephalus townsendi*	-	Threatened							x	x
West Indian Manatee[8]	***Trichechus manatus latirostris***	**-**	**Threatened**		**x**				**x**	**x**	

Table H-1: ESA-Listed Species at Project Areas and Along Transportation Routes (continued)

Common Name[1]	Scientific Name	Distinct Population Segment (DPS)[2]/ Evolutionarily Significant Unit (ESU)[3]	Status	Portion of the Study Area[4]							
				Virginia	Alabama	Texas	Washington		Towing Route[5]	Heavy Lift Ship Route[6]	Barge Route[7]
				Hampton Roads Metro Area	Port of Mobile	Port of Brownsville	PSNS & IMF	Port of Benton			
Reptiles											
Green Sea Turtle	***Chelonia mydas***	East Pacific DPS	Threatened							x	
		North Atlantic DPS[11]	**Threatened**	**x**	**x**	**x**			**x**	**x**	
		South Atlantic DPS	Threatened						x	x	
Hawksbill Sea Turtle[11]	***Eretmochelys imbricata***	**-**	**Endangered**		**x**				**x**	**x**	
Kemp's Ridley Sea Turtle[11]	***Lepidochelys kempii***	**-**	**Endangered**	**x**	**x**				**x**	**x**	
Leatherback Sea Turtle[11]	***Dermochelys coriacea***	**-**	**Endangered**	**x**	**x**	**x**			**x**	**x**	**x**
Loggerhead Sea Turtle	***Caretta caretta***	North Pacific Ocean DPS	Endangered							x	
		Northwest Atlantic Ocean DPS[11]	**Threatened**	**x**	**x**				**x**	**x**	
		South Atlantic Ocean DPS	Endangered						x	x	
Olive Ridley Sea Turtle	*Lepidochelys olivacea*	Mexico's Pacific Coast Breeding Colonies	Endangered							x	
		All other areas	Threatened						x	x	
Alabama red-bellied turtle	***Pseudemys alabamensis***	**-**	**Endangered**		**x**					**x**	

Table H-1: ESA-Listed Species at Project Areas and Along Transportation Routes (continued)

Common Name[1]	Scientific Name	Distinct Population Segment (DPS)[2]/ Evolutionarily Significant Unit (ESU)[3]	Status	Portion of the Study Area[4]							
				Virginia	Alabama	Texas	Washington		Towing Route[5]	Heavy Lift Ship Route[6]	Barge Route[7]
				Hampton Roads Metro Area	Port of Mobile	Port of Brownsville	PSNS & IMF	Port of Benton			
Fishes											
Alabama Sturgeon[8]	***Scaphirhynchus suttkusi***	-	**Endangered**		x					x	
Atlantic Sturgeon[8]	***Acipenser oxyrinchus***	**Carolina DPS[11]**	**Endangered**	x					x	x	
		Chesapeake Bay DPS[11]	**Endangered**	x					x	x	
		Gulf of Maine DPS[11]	**Threatened**	x					x	x	
		New York Bight DPS[11]	**Endangered**	x					x	x	
		South Atlantic DPS[11]	**Endangered**	x					x	x	
Gulf Sturgeon[8,9, 11]	***Acipenser oxyrinchus desotoi***	-	**Threatened**		x				x	x	
Green Sturgeon	*Acipenser medirostris*	Southern DPS	Threatened							x	x
Shortnose Sturgeon[11]	***Acipenser brevirostrum***	-	**Endangered**	x					x	x	
Bocaccio Rockfish	***Sebastes paucispinis***	**Puget Sound/Georgia Basin DPS**	**Endangered**				x			x	x
Yelloweye Rockfish	***Sebastes ruberrimus***	**Puget Sound/Georgia Basin DPS**	**Threatened**				x			x	x
Bull Trout[10]	***Salvelinus confluentus***	**Coastal-Puget Sound DPS**	**Threatened**				x			x	x
		Columbia River DPS	**Threatened**					x		x	x

Table H-1: ESA-Listed Species at Project Areas and Along Transportation Routes (continued)

Common Name[1]	Scientific Name	Distinct Population Segment (DPS)[2]/ Evolutionarily Significant Unit (ESU)[3]	Status	Portion of the Study Area[4]							
				Virginia	Alabama	Texas	Washington		Towing Route[5]	Heavy Lift Ship Route[6]	Barge Route[7]
				Hampton Roads Metro Area	Port of Mobile	Port of Brownsville	PSNS & IMF	Port of Benton			
Chinook Salmon	*Oncorhynchus tshawytscha*	California Coastal ESU	Threatened							x	x
		Central Valley Spring-Run ESU	Threatened							x	x
		Lower Columbia River ESU	Threatened							**x**	**x**
		Puget Sound ESU	**Threatened**				**x**			**x**	**x**
		Sacramento River Winter-Run ESU	Endangered							x	x
		Snake River Spring/Summer Run ESU	Threatened					x		x	x
		Snake River Fall-Run ESU	Threatened					x		x	x
		Upper Columbia River Spring-Run ESU	**Endangered**					**x**		**x**	**x**
		Upper Willamette River ESU	Threatened							x	x
Chum Salmon	*Oncorhynchus keta*	Columbia River ESU	Threatened					x		x	x
		Hood Canal Summer-Run ESU	Threatened							x	x

Table H-1: ESA-Listed Species at Project Areas and Along Transportation Routes (continued)

Common Name[1]	Scientific Name	Distinct Population Segment (DPS)[2]/ Evolutionarily Significant Unit (ESU)[3]	Status	Portion of the Study Area[4]							
				Virginia	Alabama	Texas	Washington		Towing Route[5]	Heavy Lift Ship Route[6]	Barge Route[7]
				Hampton Roads Metro Area	Port of Mobile	Port of Brownsville	PSNS & IMF	Port of Benton			
Coho Salmon	*Oncorhynchus kisutch*	Central California Coast ESU	Endangered							x	x
		Lower Columbia River ESU	Threatened							x	x
		Oregon Coast ESU	Threatened							x	x
		Southern Oregon and Northern California Coasts ESU	Threatened							x	x
Steelhead	***Oncorhynchus mykiss***	California Central Valley DPS	Threatened							x	x
		Central California Coast DPS	Threatened							x	x
		Lower Columbia River DPS	Threatened							x	x
		Middle Columbia River DPS	**Threatened**					**x**		**x**	**x**
		Northern California DPS	Threatened							x	x
		Puget Sound DPS	**Threatened**				**x**			**x**	**x**
		Snake River Basin DPS	Threatened							x	x

Table H-1: ESA-Listed Species at Project Areas and Along Transportation Routes (continued)

Common Name[1]	Scientific Name	Distinct Population Segment (DPS)[2]/ Evolutionarily Significant Unit (ESU)[3]	Status	Portion of the Study Area[4]							
				Virginia	Alabama	Texas	Washington		Towing Route[5]	Heavy Lift Ship Route[6]	Barge Route[7]
				Hampton Roads Metro Area	Port of Mobile	Port of Brownsville	PSNS & IMF	Port of Benton			
		South-Central California Coast DPS	Threatened							x	x
		Southern California DPS	Endangered							x	x
		Upper Columbia River DPS	**Threatened**					**x**		**x**	**x**
		Upper Willamette River DPS	Threatened							x	x
Sockeye Salmon	*Oncorhynchus nerka*	Ozette Lake ESU	Threatened							x	x
		Snake River ESU	Endangered					x		x	x
Eulachon	*Thaleichthys pacificus*	Southern DPS	Threatened							x	x
Giant Manta Ray[11]	*Manta birostris*	-	Threatened						x	x	
Largetooth Sawfish	*Pristis microdon*	-	Endangered						x	x	
Nassau Grouper	*Epinephelus striatus*	-	Threatened						x	x	
Oceanic Whitetip Shark[11]	*Carcharhinus longimanus*	-	Threatened						x	x	
Scalloped Hammerhead Shark	*Sphyrna lewini*	Central and Southwest Atlantic DPS[11]	Threatened						x	x	
		Eastern Pacific DPS	Endangered							x	
Smalltooth Sawfish	*Pristis pectinate*	U.S. portion of range DPS	Endangered						x	x	

Table H-1: ESA-Listed Species at Project Areas and Along Transportation Routes (continued)

Common Name[1]	Scientific Name	Distinct Population Segment (DPS)[2]/ Evolutionarily Significant Unit (ESU)[3]	Status	Portion of the Study Area[4]							
				Virginia	Alabama	Texas	Washington		Towing Route[5]	Heavy Lift Ship Route[6]	Barge Route[7]
				Hampton Roads Metro Area	Port of Mobile	Port of Brownsville	PSNS & IMF	Port of Benton			
Birds											
Marbled Murrelet	***Brachyramphus marmoratus***	**-**	**Threatened**				**x**			**x**	**x**
Marine Invertebrates											
Boulder Star Coral[12]	*Orbicella franksi*	-	Threatened						x	x	
Elkhorn Coral[12]	*Acropora palmata*	-	Threatened						x	x	
Lobed Star Coral[12]	*Orbicella annularis*	-	Threatened						x	x	
Mountainous Star Coral[12]	*Orbicella faveolate*	-	Threatened						x	x	
Rough Cactus Coral[12]	*Mycetophyllia ferox*	-	Threatened						x	x	
Pillar Coral[12]	*Dendrogyra cylindrus*	-	Threatened						x	x	
Staghorn Coral[12]	*Acropora cervicornis*	-	Threatened						x	x	
Sunflower sea star	*Pycnopodia helianthoides*	-	Proposed Threatened				x			x	x

[1]Species in **bold** are analyzed in detail in Section 3.5 (Biological Resources) of this EIS/OEIS.
[2]A species with more than one DPS can have more than one ESA listing status, as individual DPSs can be either not listed under the ESA or can be listed as an endangered, threatened, or candidate species.
[3]ESU is a population of organisms that is considered distinct for purposes of conservation.
[4]Species marked with an "**x**" indicates that the species is found within a specific Project Area or along a transportation route segment between Project Areas analyzed in Section 3.5 (Biological Resources).
[5]The towing route would begin at Newport News, Virginia, and end at either the Port of Brownsville, Texas; or the Port of Mobile, Alabama. Transit between Newport News, Virginia, and another location in the Hampton Roads Metropolitan Area, Virginia, would be a local tow consistent with normal operations in the area.
[6]The heavy-lift ship route would begin at the Hampton Roads Metropolitan Area, Virginia; the Port of Brownsville, Texas; or the Port of Mobile, Alabama, and end at PSNS & IMF.
[7]The barge route would begin at PSNS & IMF, exit Puget Sound into the Pacific Ocean, travel down the coastline and enter the mouth of the Columbia River, terminating at the Port of Benton barge slip.
[8]These species potentially occur within Mobile Bay along the Mobile Harbor Federal Navigation Channel during a ship's tow approach into the Port of Mobile or on a heavy-lift barge departure route from the Port of Mobile. Because the Port of Mobile was not included in the 2019 NMFS Programmatic Biological Opinion, these species were not analyzed for potential effects of inactive ship towing.
[9]The Gulf sturgeon was included in the 2019 NMFS Programmatic Biological Opinion, however, a tow route to or from the Port of Mobile was not analyzed. NMFS determined that towing inactive ships may affect, but *not likely adversely affect this species*.

Table H-1: ESA-Listed Species at Project Areas and Along Transportation Routes (continued)

Common Name[1]	Scientific Name	Distinct Population Segment (DPS)[2]/ Evolutionarily Significant Unit (ESU)[3]	Status	Portion of the Study Area[4]							
				Virginia	Alabama	Texas	Washington		Towing Route[5]	Heavy Lift Ship Route[6]	Barge Route[7]
				Hampton Roads Metro Area	Port of Mobile	Port of Brownsville	PSNS & IMF	Port of Benton			

[10]In a letter dated July 22, 2019, the USFWS concurred that the towing of inactive Navy ships into and out of Puget Sound may affect, but is *not likely to adversely affect*, bull trout, a fish species under the USFWS regulatory authority.
[11]NMFS provided the Navy with a letter of concurrence in March 2023, and included "may affect, but not likely to adversely affect" determinations for these species indicated by this note. These species may occur along the offshore tow route and/or the heavy lift ship route, and are not included in Section 3.5 discussions
[12]Coral species were included as part of the 2019 Programmatic Inactive Ship Towing Biological Opinion. These species may occur along the offshore tow route and/or the heavy lift ship route, and are not included in Section 3.5 discussions.
Notes: ESA = Endangered Species Act, PSNS & IMF = Puget Sound Naval Shipyard and Intermediate Maintenance Facility

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Environmental Impact Statement/ Overseas Environmental Impact Statement Disposal of Decommissioned, Defueled Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants

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Appendix I Air Quality Emissions Calculations and Record of Non-Applicability

I.1 Emission Estimates

I.1.1 Vessel Activities

The methods for estimating ship emissions involve evaluating the type of activity, generating the average steaming hours for ships in each area, within state waters, beyond state waters and beyond territorial seas. Vessel emissions from river and ocean tug boats and heavy-lift ships were calculated using the United States (U.S.) Environmental Protection Agency (EPA) *Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emission Inventories Draft Report* (EPA, 2020). Lead emissions were estimated using the EPA speciation ratio relative to particulate matter less than or equal to 10 microns in diameter (PM_{10}) (SNC-Lavalin Environment, 2012). Larger vessels also have generators operating onboard to provide electricity for non-propulsion functions and may also have separate bow thruster engines used in berthing. Each of these vessels incorporates different propulsion methods such as marine outboard engines, diesel engines, and gas turbines. Data from the EPA methodology included emission factors for each type of propulsion and type of onboard generator by ship type, as well as the fuel used. To determine the emissions from vessel activities, the number of vessels was multiplied by the number of one-way trips per transport package multiplied by the total number of packages. This value was then multiplied by the number of hours spent in each range from shore, 0–3 nautical miles (nm), 3–12 nm, 0–9 nm (Texas), 9–12 nm (Texas), and >12 nm. Finally, this value was multiplied by each criteria pollutant's emission factors. One-way trips were analyzed for commercial tugboats, anticipating that they would be used for other non-project related activities on their trip. Return trips for tugboats that would be used to return the Navy barge to Navy facilities were analyzed.

I.1.2 Construction Activities

Emissions factors for construction activities (barge slip and road modifications) were developed using the EPA Motor Vehicle Emission Simulator (MOVES), version 2014. The Non-ROAD module of MOVES 2014 was used for anticipated off-road vehicles and equipment. Emission factors from the EPA MOVES are in grams/operating hour, which were then converted to pounds/operating hour. The following formula is used to determine the total emissions for each piece of equipment:

$$E\ (total\ weight\ emitted) = F\ x\ H\ x\ D\ x\ Q$$

E = Emissions
F = Emissions Factor (lb/hr)
H = Quantity of Hours Operating per Day
D = Quantity of Days Operating
Q = Quantity of Equipment Used

I.1.3 Vehicle Transport Activities

EPA Heavy-Duty Highway Compression-Ignition Engines and Urban Buses: Exhaust Emission Standards (EPA, 2018) were used to estimate the emissions from vehicle transport of reactor plant components from commercial dismantlement facilities to disposal facilities. For a conservative estimate of emissions from vehicle transport, the longest land transport route was selected, as that would represent the highest level of emissions. Based on Table F-2 in Appendix F (Radiological Transportation Analyses for the Disposal of Decommissioned, Defueled Ex-Enterprise Naval Reactor Plants), the longest route via highway was 2,461 miles. At an average speed of 50 miles per hour and approximately 10 hours of

driving per day, a single transport could travel approximately 500 miles a day. This results in an average trip duration of five days, traveling 10 hours per day. As a conservative estimate, the total number of transits by semi-truck was assumed equal to the estimated maximum number of container express (commonly known as CONEX) boxes for radioactive waste associated with the reactor plants, or 440 transits.

I.2 Emission Estimate Tables

I.2.1 Alternative 1 Vessel Emissions

The table below presents distances used in calculating vessel emissions.

Table I-1: Single Trip Distances to Calculate Vessel Emissions

Vessel	Notes	Approximate Total Mileage (nautical miles)	Average Speed (kts) (River Speed is mph)	Single Trip Distance (miles)				
				Total Miles Within 3 nm	Total Miles Between 3 and 12 nm	Total Miles Within 9 nm (Texas)	Total Miles Between 9 and 12 nm (Texas)	Total Miles Greater than 12 nm
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	1,911	9	28	18	9.1	3.28	1,865
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	23,646	9	50	93	9.1	3.28	23,503
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	371	9	233	31	0	0	107
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	240	8	240	0	0	0	0

Notes: (1) PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, kts = knots, mph = miles per hour, nm = nautical miles

Table I-2: Single Trip Durations Used to Calculate Vessel Emissions

Vessel	Notes	Approximate Total Mileage (miles)	Average Speed (kts) (River Speed is mph)	Single Trip Duration					
				Total Duration (hour)	Total Hours (0–3 nm)	Total Hours (3–12 nm)	Total Hours (0–9 nm) Texas	Total Hours (9–12 nm) Texas	Total Hours (>12 nm)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	1,911	9	212.3	3.1	2.0	1.0	0.36	207.2
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	23,646	9	2,627.3	5.6	10.3	1.0	0.36	2,611.4
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	371	9	41.2	25.9	3.4	0.0	0.00	11.9
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	240	8	30.0	30.0	0.0	0.0	0.00	0.0

Notes: PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, kts = knots, mph = miles per hour, nm = nautical mile(s)

Table I-3: Number of Vessels and Total Trip Durations Within 0–3 Nautical Miles, 3–12 Nautical Miles, and Beyond 12 Nautical Miles Under Alternative 1

Vessel	Notes	Number of Vessels	Number of One Way Trips Per Package	Number of Packages	Total Duration			
					Total Duration (hour)	Total Hours (0–3 nm)	Total Hours (3–12 nm)	Total Hours (>12 nm)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	3	1	1	637.0	9.3	6.0	621.7
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	1	1	1	2,627.3	5.6	10.3	2,611.4
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	2	1.5	8	989.3	621.3	82.7	285.3
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	2	1.5	8	720.0	720.0	0.0	0.0

Notes: (1) PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, nm = nautical mile(s)
(2) Towing ex-Enterprise from existing location to commercial dismantlement facility: Three Commercial Ocean Tugs (one-way trip is analyzed)
(3) Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF: One Commercial Heavy Lift Ship (one-way trip is analyzed)
(4) Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington: two tugs to Vancouver, one to bring the Navy barge back (1.5 one-way trip analyzed for two tugs)
(5) Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip: two river tugs to barge slip, one to bring the Navy barge back (1.5 one-way trip analyzed for two tugs)

Table I-4: Number of Vessels and Total Trip Durations in Texas Within 9 Nautical Miles and Between 9 and 12 Nautical Miles Under Alternative 1

Vessel	Notes	Number of Vessels	Number of One Way Trips Per Package	Number of Packages	Total Duration (Texas)	
					Total Hours (0–9 nm)	Total Hours (9–12 nm)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	3	1	1	3.0	1.1
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	1	1	1	1.0	0.4

Note: PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, nm = nautical mile(s)

Table I-5: Vessel Emissions Factors for Propulsion Engines and Generators Under Alternative 1

Vessel	Notes	Emissions Factors (lb/hr) Propulsion Engines + Generators (>20% Load)							
		CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	Pb	CO_2
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	25.08	104.32	1.85	0.52	3.74	3.63	5.44E-04	8,554.33
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	75.87	838.99	31.72	2.43	11.44	10.52	1.47E-04	39,856.11
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	25.08	104.32	1.85	0.52	3.74	3.63	5.44E-04	8,554.33
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	12.23	41.61	0.63	0.26	1.81	1.76	2.64E-04	4,317.46

Notes: CO = carbon monoxide, CO_2 = carbon dioxide, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_x = sulfur oxides, VOC = volatile organic compounds, PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, lb/hr = pounds per hour. Lead emissions were estimated using the EPA speciation ratio relative to PM_{10}. For Category 1 and 2 engines (ocean tugs and river tugs) the ratio of lead to PM_{10} is 0.00015. For category 3 engines (heavy lift ship), the ratio is 0.000014. Source: November 2012 National Marine Emissions Inventory for Canada (Taken from USEPA 2008 NEI), EPA's U.S. National Emissions Inventory for 2008, available from https://www.epa.gov/air-emissions-inventories/2008-nei-technical-support-document

Table I-6: Estimated Vessel Emissions from 0 to 3 Nautical Miles Under Alternative 1

Vessel	Notes	Annual Criteria Pollutant[1] Emissions 0–3 nm (tons per year)							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x,[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	0.12	0.49	0.01	0.002	0.02	0.017	2.62E-06	36.22
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	0.21	2.33	0.09	0.01	0.03	0.03	4.45E-07	100.44
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	7.79	32.41	0.57	0.16	1.16	1.129	1.75E-04	2,410.89
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	4.40	14.98	0.23	0.10	0.65	0.632	9.77E-05	1,410.03
Totals		**12.52**	**50.21**	**0.90**	**0.27**	**1.86**	**1.81**	**2.75E-04**	**3,957.56**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, nm = nautical mile(s), PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, MT = metric tons

Table I-7: Estimated Vessel Emissions from 0 to 9 Nautical Miles (Texas) Under Alternative 1

Vessel	Notes	Annual Criteria Pollutant[21] Emissions 0–9 nm (tons per year) Texas							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x,[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	0.04	0.16	0.003	0.001	0.006	0.006	8.52E-07	11.77
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	0.04	0.42	0.016	0.001	0.006	0.005	8.10E-08	56.20
Totals		**0.08**	**0.58**	**0.019**	**0.002**	**0.011**	**0.011**	**9.33E-07**	**67.97**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, nm = nautical mile(s), PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, MT = metric tons

Table I-8: Estimated Vessel Emissions from 3 to 12 Nautical Miles Under Alternative 1

Vessel	Notes	Annual Criteria Pollutant[1] Emissions 3–12 nm (tons per year)							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	0.08	0.31	0.01	0.002	0.01	0.01	1.69E-06	23.28
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	0.39	4.33	0.16	0.01	0.06	0.05	8.27E-07	186.81
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	1.04	4.31	0.08	0.02	0.15	0.15	2.32E-05	320.76
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
	Totals	**1.50**	**8.96**	**0.25**	**0.04**	**0.23**	**0.22**	**2.57E-05**	**530.85**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds. nm = nautical mile(s), PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, MT = metric tons

Table I-9: Estimated Vessel Emissions from 9 to 12 Nautical Miles (Texas) Under Alternative 1

Vessel	Notes	Annual Criteria Pollutant[1] Emissions 9–12 nm (tons per year) Texas							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	0.01	0.06	0.001	0.000	0.002	0.002	3.07E-07	4.24
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	0.01	0.15	0.006	0.000	0.002	0.002	2.92E-08	6.59
	Totals	**0.03**	**0.21**	**0.007**	**0.001**	**0.004**	**0.004**	**3.36E-07**	**10.83**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds. nm = nautical mile(s), PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility , MT = metric tons

Table I-10: Estimated Vessel Emissions Beyond 12 Nautical Miles Under Alternative 1

Vessel	Notes	Annual Criteria Pollutant[1] Emissions >12 nm (tons per year)							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	7.80	32.43	0.57	0.16	1.16	1.13	1.75E-04	2,412.18
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	99.07	1,095.49	41.42	3.17	14.93	13.74	2.09E-04	47,210.87
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	3.58	14.88	0.26	0.07	0.53	0.52	8.01E-05	1,107.15
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
Totals		**110.44**	**1,142.80**	**42.26**	**3.41**	**16.63**	**15.39**	**4.64E-04**	**50,730.19**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, MT = metric tons

I.2.2 Alternative 1 Ground Transport Emissions

Table I-11: Equipment Type and Number of Trips for Land Transport from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site Under Alternative 1

Transportation Activity	Equipment/Vehicles	Horsepower	Source	Fuel	Number of Equipment	Days of Use	Hours Per Day	Number of Trips	Total Hours
Land transport from Port of Benton barge slip to Trench 94 at the DOE Hanford Site	Multiple-Wheel High-Capacity Transporters Off-Road Truck	3000	MOVES 2014	Diesel	3	1	10	8	240

Notes: (1) DOE = Department of Energy
(2) One-way trips are analyzed. The vehicles are not Navy owned; therefore, it assumed that they would go on to other jobs unrelated to the Proposed Action after drop off.

Table I-12: Emissions Factors from Land Transport from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site Under Alternative 1

Transportation Activity	Equipment/Vehicles	Emissions Factors, (lb/hr)						
		VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Land transport from Port of Benton barge slip to Trench 94 at the DOE Hanford Site	Multiple-Wheel High-Capacity Transporters Off-Road Truck	1.03	3.08	13.41	0.01	0.33	0.32	2,866

Notes: CO = carbon monoxide, CO_2 = carbon dioxide, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_x = sulfur oxides, VOC = volatile organic compounds, DOE = Department of Energy, lb/hr = pounds per hour
Lead emissions were estimated using the CARB August 2020 Speciation Profiles (https://ww2.arb.ca.gov/speciation-profiles-used-carb-modeling)

Chemical Code/Name	Weight Fraction Of $PM_{2.5}$	Weight Fraction Of PM_{10}	Weight Fraction Of Total PM	PM Profile Number	PM Profile Name
12128/Lead	0.000007	0.000042	0.00003	425	Diesel Vehicle Exhaust

Table I-13: Estimated Emissions from Land Transport from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site Under Alternative 1

Transportation Activity	Equipment/Vehicles	Annual Criteria Pollutant[1] Emissions, (tons per year)							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Land transport from Port of Benton barge slip to Trench 94 at the DOE Hanford Site	Multiple-Wheel High-Capacity Transporters Off-Road Truck	0.37	1.61	0.12	0.002	0.04	0.04	1.67E-06	311.966

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, DOE = Department of Energy, MT = metric tons

I.2.3 Alternative 2 Vessel Emissions

The distances, single trip durations, and vessel emission factors used in calculating the vessel emissions under Alternative 2 are the same as those used under Alternative 1.

Table I-14: Number of Vessels and Total Trip Durations from 0 to 3 Nautical Miles, 3 to 12 Nautical Miles, and Beyond 12 Nautical Miles Under Alternative 2

Vessel	Notes	Number of Vessels	Number of One Way Trips Per Package	Number of Packages	Total Duration			
					Total Duration (hour)	Total Hours (0–3 nm)	Total Hours (3–12 nm)	Total Hours (>12 nm)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	3	1	1	637.0	9.3	6.0	621.7
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	1	1	1	2,627.3	5.6	10.3	2,611.4
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	2	1.5	4	494.7	310.7	41.3	142.7
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	2	1.5	4	360.0	360.0	0.0	0.0

Notes: PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, nm = nautical mile(s)

Table I-15: Estimated Vessel Emissions from 0 to 3 Nautical Miles Under Alternative 2

Vessel	Notes	Annual Criteria Pollutant[1] Emissions 0–3 nm (tons per year)							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	0.12	0.49	0.01	0.00	0.02	0.017	2.62E-06	36.22
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	0.21	2.33	0.09	0.01	0.03	0.03	4.45E-07	100.44
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	3.90	16.20	0.29	0.08	0.58	0.564	8.73E-05	1,205.44
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	2.20	7.49	0.11	0.05	0.33	0.316	4.89E-05	705.01
	Totals	**6.42**	**26.51**	**0.50**	**0.14**	**0.96**	**0.93**	**1.39E-04**	**2,047.11**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, nm = nautical mile(s), PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, MT = metric tons

Table I-16: Estimated Vessel Emissions from 3 to 12 Nautical Miles Under Alternative 2

Vessel	Notes	Annual Criteria Pollutant[1] Emissions 3–12 nm (tons per year)							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	0.08	0.31	0.01	0.00	0.01	0.01	1.69E-06	23.28
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	0.39	4.33	0.16	0.01	0.06	0.05	8.27E-07	186.81
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	0.52	2.16	0.04	0.01	0.08	0.08	1.16E-05	160.38
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
	Totals	**0.99**	**6.80**	**0.21**	**0.02**	**0.15**	**0.14**	**1.41E-05**	**370.47**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, nm = nautical mile(s), PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, MT = metric tons

Table I-17: Estimated Vessel Emissions Beyond 12 Nautical Miles Under Alternative 2

Vessel	Notes	Annual Criteria Pollutant[1] Emissions >12 nm (tons per year)							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	7.80	32.43	0.57	0.16	1.16	1.13	1.75E-04	2,412.18
Heavy Lift Ship	Shipment of the propulsion space section from commercial dismantlement facility to PSNS & IMF	99.07	1,095.49	41.42	3.17	14.93	13.74	2.09E-04	47,210.87
Ocean Tug	Shipment of reactor compartment packages via ocean tug from PSNS & IMF to Vancouver, Washington	1.79	7.44	0.13	0.04	0.27	0.26	4.01E-05	553.57
River Tug	Shipment of reactor compartment packages via river tug from Vancouver, Washington, to Port of Benton barge slip	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
Totals		**108.66**	**1,135.36**	**42.12**	**3.37**	**16.37**	**15.13**	**4.24E-04**	**50,176.62**

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, nm = nautical mile(s), PSNS & IMF = Puget Sound Naval Shipyard & Intermediate Maintenance Facility, MT = metric tons

I.2.4 Alternative 2 Ground Transport Emissions

Table I-18: Equipment Type and Number of Trips for Land Transport from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site Under Alternative 2

Transportation Activity	Equipment/Vehicles	Horsepower	Source	Fuel	Number of Equipment	Days of Use	Hours Per Day	Number of Trips	Total Hours
Land transport from Port of Benton barge slip to Trench 94 at the DOE Hanford Site	Multiple Wheel High-Capacity Transporters Off-Road Truck	3000	MOVES 2014	Diesel	3	1	10	4	120

Notes: DOE = Department of Energy

Table I-19: Emissions Factors from Land Transport from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site Under Alternative 2

Transportation Activity	Equipment/Vehicles	Emissions Factors (lb/hr)						
		VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Land transport from Port of Benton barge slip to Trench 94 at the DOE Hanford Site	Multiple Wheel High-Capacity Transporters Off-Road Truck	1.03	3.08	13.41	0.01	0.33	0.32	2,865.65

Notes: CO = carbon monoxide, CO_2 = carbon dioxide, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_x = sulfur oxides, VOC = volatile organic compounds, DOE = Department of Energy, lb/hr = pounds per hour
Lead emissions were estimated using the CARB August 2020 Speciation Profiles (https://ww2.arb.ca.gov/speciation-profiles-used-carb-modeling

Chemical Code/Name	Weight Fraction Of $PM_{2.5}$	Weight Fraction Of PM_{10}	Weight Fraction Of Total PM	PM Profile Number	PM Profile Name
12128/Lead	0.000007	0.000042	0.00003	425	Diesel Vehicle Exhaust

Table I-20: Estimated Emissions from Land Transport from Port of Benton Barge Slip to Trench 94 at the Department of Energy Hanford Site Under Alternative 2

Transportation Activity	Equipment/Vehicles	Annual Criteria Pollutant[1] Emissions (tons per year)							
		VOC[2,3]	CO	NO_x[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Land transport from Port of Benton barge slip to Trench 94 at the DOE Hanford Site	Multiple Wheel High-Capacity Transporters Off-Road Truck	0.06	0.18	0.80	0.00	0.02	0.02	8.37E-07	155.98

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, DOE= Department of Energy, MT = metric tons

I.2.5 Alternative 2 Construction Emissions

Table I-21: Construction Equipment and Estimated Hours Per Equipment Under Alternative 2

Construction Activity	Equipment/Vehicles	Horsepower	Source	Fuel	Number of Equipment	Days of Use	Hours Per Day	Total Hours
Barge Slip Modification								
Excavator	Caterpillar 352F	417	MOVES 2014	Diesel	2	7	4	56
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Crane	Grove GMK3060	410	MOVES 2014	Diesel	1	10	1	10
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Pile Driver (Vibratory)	Hammer & Steel HVR60	134	MOVES 2014	Diesel	1	10	5	50
Pile Drive (Impact)	APE Model 500u	700	MOVES 2014	Diesel	1	4	2	8
Concrete Truck	International HV	360	MOVES 2014	Diesel	2	2	8	32
Loader	Caterpillar 906M	73	MOVES 2014	Diesel	1	5	4	20
Bulldozer	Deere 550K	92	MOVES 2014	Diesel	1	5	4	20
Compressor	Central Pneumatic	2	MOVES 2014	Gasoline	0	0	0	0
Pump		60	MOVES 2014	Diesel	0	0	0	0
Road Modification Location 1								
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1
Road Modification Location 2								
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1
Road Modification Location 3								
Excavator	Caterpillar 352F	417	MOVES 2014	Diesel	2	7	4	56
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1

Table I-21: Construction Equipment and Estimated Hours Per Equipment Under Alternative 2 (continued)

Construction Activity	Equipment/Vehicles	Horsepower	Source	Fuel	Number of Equipment	Days of Use	Hours Per Day	Total Hours
Road Modification Location 4								
Excavator	Caterpillar 352F	417	MOVES 2014	Diesel	2	7	4	56
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1
Road Modification Location 5								
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1
Road Modification Location 6								
Excavator	Caterpillar 352F	417	MOVES 2014	Diesel	2	7	4	56
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1
Road Modification Location 7								
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1
Paver	Volvo P5170B	173	MOVES 2014	Diesel	0	0	8	0
Road Modification Location 8								
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1

Table I-21: Construction Equipment and Estimated Hours Per Equipment Under Alternative 2 (continued)

Construction Activity	Equipment/Vehicles	Horsepower	Source	Fuel	Number of Equipment	Days of Use	Hours Per Day	Total Hours
Road Modification Location 9								
Excavator	Caterpillar 352F	417	MOVES 2014	Diesel	2	7	4	56
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1
Road Modification Location 10								
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1
Road Modification Location 11								
Excavator	Caterpillar 352F	417	MOVES 2014	Diesel	2	7	4	56
Backhoe	Caterpillar 420XE	92	MOVES 2014	Diesel	2	7	4	56
Dump truck	Komatsu HM400-2	438	MOVES 2014	Diesel	2	6	8	96
Soil Compactor/Roller	Case SV208D	74.3	MOVES 2014	Diesel	1	1	1	1

Table I-22: Estimated Emissions from Proposed Construction Activities Under Alternative 2

Construction Activity	Annual Criteria Pollutant[1] Emissions (tons per year)							
	VOC[2,3]	CO	NO_x[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Barge Slip Modification								
Excavator	3.61E-03	1.18E-02	3.01E-02	7.18E-05	1.74E-03	1.69E-03	1.74E-08	1.23E+01
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Crane	7.45E-04	2.46E-03	9.36E-03	1.37E-05	3.70E-04	3.59E-04	3.70E-09	2.19E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Pile Driver (Vibratory)	2.02E-03	6.54E-03	2.39E-02	2.31E-05	1.44E-03	1.39E-03	1.44E-08	3.49E+00
Pile Drive (Impact)	1.36E-03	7.03E-03	2.03E-02	1.93E-05	9.23E-04	8.95E-04	9.23E-09	2.93E+00
Concrete Truck	1.99E-03	3.33E-03	9.80E-03	3.93E-05	3.90E-04	3.78E-04	3.90E-09	7.21E+00
Loader	2.36E-04	1.81E-03	4.31E-03	4.48E-06	1.83E-04	1.77E-04	1.83E-09	7.35E-01
Bulldozer	1.22E-03	8.15E-03	6.39E-03	7.87E-06	1.13E-03	1.09E-03	1.13E-08	1.21E+00
Compressor	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pump	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Road Modification Location 1								
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02
Road Modification Location 2								
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02
Road Modification Location 3								
Excavator	3.61E-03	1.18E-02	3.01E-02	7.18E-05	1.74E-03	1.69E-03	1.74E-08	1.23E+01
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02
Road Modification Location 4								
Excavator	3.61E-03	1.18E-02	3.01E-02	7.18E-05	1.74E-03	1.69E-03	1.74E-08	1.23E+01
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02
Road Modification Location 5								
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02

Table I-22: Estimated Emissions from Proposed Construction Activities Under Alternative 2 (continued)

Construction Activity	Annual Criteria Pollutant[1] Emissions (tons per year)							
	VOC[2,3]	CO	NO_x[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Road Modification Location 6								
Excavator	3.61E-03	1.18E-02	3.01E-02	7.18E-05	1.74E-03	1.69E-03	1.74E-08	1.23E+01
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02
Road Modification Location 7								
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02
Paver	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Road Modification Location 8								
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02
Road Modification Location 9								
Excavator	3.61E-03	1.18E-02	3.01E-02	7.18E-05	1.74E-03	1.69E-03	1.74E-08	1.23E+01
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02
Road Modification Location 10								
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02
Road Modification Location 11								
Excavator	3.61E-03	1.18E-02	3.01E-02	7.18E-05	1.74E-03	1.69E-03	1.74E-08	1.23E+01
Backhoe	8.23E-04	5.63E-03	5.84E-03	1.67E-05	6.11E-04	5.93E-04	6.11E-09	2.93E+00
Dump truck	5.98E-03	9.98E-03	2.94E-02	1.18E-04	1.17E-03	1.13E-03	1.17E-08	2.16E+01
Soil Compactor/Roller	1.61E-05	1.37E-04	1.37E-04	3.00E-07	1.69E-05	1.64E-05	1.69E-10	5.05E-02

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, MT = metric tons

I.2.6 Alternatives 1 and 2 Trench 94 Rail System Construction Emissions

Table I-23: Trench 94 Construction Equipment and Estimated Hours and Fuel Consumption

Equipment Activity	Equipment/ Vehicles	Model Year	Horsepower	Source	Fuel	Load Factor	Number of Equipment	Days of Use	Hours Per Day	Total Hours	Total Fuel Consumed, Gal
Excavator	Excavator	2017	117	CARB 2017 Off-Road Diesel Emission Factors and CARB 2017 Off-Road CI Engine Standards (Diesel)	Diesel	0.38	1	5	8	40	92
Rough Terrain Forklift	Forklift	2017	100	CARB 2017 Off-Road Diesel Emission Factors and CARB 2017 Off-Road CI Engine Standards (Diesel)	Diesel	0.4	1	5	8	40	92
Motor Grader	Grader	2017	139	CARB 2017 Off-Road Diesel Emission Factors and CARB 2017 Off-Road CI Engine Standards (Diesel)	Diesel	0.41	1	5	8	40	118

Notes: (1) CARB = California Air Resources Board, CI = Compression Ignition, gal = gallons
(2) Fuel consumption was calculated by CARB 2017 Off-Road Diesel Emission Factors and CARB 2017 Off-Road CI Engine Standards (Diesel) for equipment size, fuel, load factor, and total hours of operation (https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-road).
(3) Load Factors are based on CARB 2017 Off-Road Diesel Emission Factors and CARB 2017 Off-Road CI Engine Standards (Diesel) for equipment types.

Table I-24: Trench 94 Rail System Construction-Related Emission Estimates

Equipment Activity	Annual Criteria Pollutant[1] Emissions (tons per year)							
	VOC[2,3]	CO	NO_x[2, 3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Excavator	1.09E-04	1.90E-02	2.17E-03	1.79E-05	4.79E-05	4.79E-05	4.79E-10	0.937
Rough Terrain Forklift	9.77E-05	1.63E-02	1.95E-03	1.40E-05	4.31E-05	4.31E-05	4.31E-10	0.938
Motor Grader	1.39E-04	2.26E-02	2.78E-03	1.79E-05	6.14E-05	6.14E-05	6.14E-10	1.202

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, MT = metric tons

I.2.7 Alternative 3 (Preferred Alternative) Vessel Emissions

Table I-25: Single Trip Distances for Ocean Tugs Under Alternative 3

Vessel				Single Trip Distance (miles)				
	Notes	Approximate Total Mileage (nm)	Average Speed (kts) (River Speed is mph)	Total Miles Within 3 nm	Total Miles Between 3 and 12 nm	Total Miles Within 9 nm (Texas)	Total Miles Between 9 and 12 nm (Texas)	Total Miles Greater than 12 nm
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	1,911	9	28	18	9.1	3.28	1,865

Note: nm = nautical miles, kts = knots, mph = miles per hour

Table I-26: Single Trip Durations for Ocean Tugs Under Alternative 3

Vessel			Single Trip Duration					
	Notes	Approximate Total Mileage (nm)	Total Duration (hours)	Total Hours (0–3 nm)	Total Hours (3–12 nm)	Total Hours (0–9 nm) Texas	Total Hours (9–12 nm) Texas	Total Hours (>12 nm)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	1,911	212.3	3.1	2.0	1.0	0.36	207.2

Note: nm = nautical mile(s)

Table I-27: Total Duration for Ocean Tugs Under Alternative 3

Vessel	Notes	Number of Vessels	Number of One Way Trips Per Package	Number of Packages	Total Duration			
					Total Duration (hours)	Total Hours (0–3 nm)	Total Hours (3–12 nm)	Total Hours (>12 nm)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	3	1	1	637.0	9.3	6.0	621.7

Note: nm = nautical mile(s)

Table I-28: Total Duration for Ocean Tugs Under Alternative 3 (Texas)

Vessel	Notes	Number of Vessels	Number of One Way Trips Per Package	Number of Packages	Total Duration (Texas)	
					Total Hours (0–9 nm)	Total Hours (9–12 nm)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	3	1	1	3.0	1.1

Note: nm = nautical mile(s)

Table I-29: Emissions Factors for Ocean Tugs Under Alternative 3

Vessel		Emissions Factors (lb/hr) Propulsion Engines + Generators (>20% Load)						
	Notes	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	25.08	104.32	1.85	0.52	3.74	3.63	8,554.33

Notes: CO = carbon monoxide, CO_2 = carbon dioxide, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_x = sulfur oxides, VOC = volatile organic compounds, lb/hr = pounds per hour. Lead emissions were estimated using the EPA speciation ratio relative to PM_{10}. For Category 1 and 2 engines (ocean tugs and river tugs) the ratio of lead to PM_{10} is 0.00015. Source: November 2012 National Marine Emissions Inventory for Canada (Taken from USEPA 2008 NEI), EPA's U.S. National Emissions Inventory for 2008, available from https://www.epa.gov/air-emissions-inventories/2008-nei-technical-support-document

Table I-30: Vessel Emissions from 0 to 3 Nautical Miles for Ocean Tugs Under Alternative 3

Vessel	Notes	Annual Vessel Criteria Pollutant[1] Emissions 0–3 nm (tons per year)							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	0.12	0.49	0.01	0.002	0.02	0.017	2.62E-06	36.22

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).

Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, nm = nautical mile(s) , MT = metric tons

Table I-31: Vessel Emissions from 0 to 9 Nautical Miles for Ocean Tugs Under Alternative 3 (Texas)

Vessel	Notes	Annual Vessel Criteria Pollutant[1] Emissions 0–9 nm (tons per year) Texas							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	0.04	0.16	0.00	0.00	0.01	0.01	8.52E-07	11.77

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).
[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.
[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).
Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, nm = nautical mile(s) , MT = metric tons

Table I-32: Vessel Emissions from 3 to 12 Nautical Miles for Ocean Tugs Under Alternative 3

Vessel	Notes	Annual Vessel Criteria Pollutant[1] Emissions 3–12 nm (tons per year)							
		CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	0.08	0.31	0.01	0.00	0.01	0.01	1.69E-06	23.28

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).
[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.
[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).
Notes: (1) CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, nm = nautical miles, MT = metric tons

Table I-33: Vessel Emissions from 9 to 12 Nautical Miles for Ocean Tugs Under Alternative 3 (Texas)

Vessel	Notes	Annual Vessel Criteria Pollutant[1] Emissions 9–12 nm (tons per year) Texas							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	0.01	0.06	0.00	0.00	0.00	0.00	3.07E-07	4.24

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).
[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.
[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).
Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, nm = nautical miles, MT = metric tons

Table I-34: Vessel Emissions Beyond 12 Nautical Miles for Ocean Tugs Under Alternative 3

Vessel	Notes	Annual Vessel Criteria Pollutant[1] Emissions >12 nm (tons per year)							
		CO	NO_x[2, 3]	VOC[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2e (MT/year)
Ocean Tug	Towing ex-Enterprise from existing location to commercial dismantlement facility	7.80	32.43	0.57	0.16	1.16	1.13	1.75E-04	2,412.18

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).
[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.
[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).
Notes: CO = carbon monoxide, CO_2e = carbon dioxide equivalent, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, nm = nautical miles, MT = metric tons

I.2.8 Alternative 3 (Preferred Alternative) Ground Transport Emissions

Table I-35: Vehicle Information, Fuel Consumption, and Total Trip Hours Under Alternative 3

Transportation Activity	Equipment/Vehicles	Horsepower	Source	Fuel	Number of Equipment/Trips	Miles per trip	Miles per gallon	Gallons of Fuel Used, Total	Days of Use	Hours Per Day	Total Hours
18-wheeler Truck	Mack Semi with MP8 Engine (example)	505	Heavy-Duty Highway Compression-Ignition Engines and Urban Buses: Exhaust Emission Standards	Diesel	440	2,461	8	308	5	10	22,000

Table I-36: Estimated Total Emissions Under Alternative 3

Transportation Activity	Equipment/Vehicles	Annual Criteria Pollutant[1] Emissions (tons per year)										
		VOC[2,3]	CO	NO_x[2,3]	SO_x[3]	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4 (MT/year)	N_2O (MT/year)	CO_2e (MT/year)
18-wheeler Truck	Mack Semi with MP8 Engine (example)	1.71	189.82	2.45	0.01	0.12	0.12	5.14E-06	1,381.98	0.010	0.047	1,396.14

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).
[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.
[3] $PM_{2.5}$ precursors for this action are NO_x, VOC, and sulfur dioxides (SO_2).
Notes: CH4 = methane, CO = carbon monoxide, CO_2 = carbon dioxide, CO_2e = carbon dioxide equivalent, N_2O = nitrous oxide, NO_x = nitrogen oxides, Pb = Lead, PM_{10} = particulate matter ≤ 10 microns in diameter, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, SO_X = sulfur oxides, VOC = volatile organic compounds, MT = metric tons

I.3 Record of Non-Applicability for Clean Air Act Conformity

The Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

I.3.1 Proposed Action

Action Proponent: Director, Naval Nuclear Propulsion Program

Locations: Newport News, Virginia, located within Hampton Roads Air Quality Control Region (AQCR) No. 223, designated as maintenance for the 1997 8-hour ozone National Ambient Air Quality Standards; Columbia River, portions within the Wallula PM_{10} Maintenance Area.

Proposed Action Name: Disposal of Decommissioned, Defueled Ex-Enterprise and its Associated Naval Reactor Plants

Proposed Action and Emissions Summary:

All action alternatives of the Proposed Action involve towing ex-Enterprise from its current location at Newport News Shipbuilding to one of the three commercial locations for partial or complete dismantlement. Vessels performing this action would transit through the Hampton Roads AQCR No. 223, which is a Maintenance Area for the 1997 8-hour Ozone National Ambient Air Quality Standards. Ozone is a secondary pollutant tracked by its precursor, Oxides of Nitrogen (NO_x) and Volatile Organic Compounds (VOC). As a result, Proposed Action emissions were evaluated to assess compliance with the General Conformity Rule *de minimis* thresholds for NO_x and VOC (Table I-37).

Table I-37: Criteria Pollutants *de minimis* levels for 1997 8-hour Ozone Maintenance Area

Criteria Pollutant/Precursor	***de minimis levels (tons/year)***
Oxides of Nitrogen (NO_x)	100
Volatile Organic Compounds (VOC)	100

The methods for estimating vessel emissions involve generating the average running hours for vessels in the maintenance area. Vessel emissions from ocean tugboats were calculated using *Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emission Inventories Draft Report* by the EPA for the propulsion and onboard generation systems. Data from the EPA methodology included emission factors for each type of propulsion and type of onboard generator by ship type, as well as the fuel used. To determine the emissions from vessel activities, the number of vessels was multiplied by the number of one-way trips per transport package multiplied by the total number of packages. Transit distance, time within three nautical miles, and NO_x and VOC emission factors are shown in Table I-38.

Table I-38: Transit Information and Emission Factors

Vessel	Approximate Single Trip Total Mileage (nm)	Single Trip Miles Within 3 nm	Single Trip Hours (0–3 nm)	Emission Factor (lb./hr) Propulsion Engines + Generators	
				NO_x	VOC
Ocean Tug Towing ex-Enterprise from existing location to commercial dismantlement facility	1,911	28	3.1	104.32	1.85

Notes: nm = nautical mile(s), lb./hr = pounds per hour, NO_x = nitrogen oxides, VOC = Volatile Organic Compound

Based on the air quality analysis for all action alternatives (Table I-39), the maximum estimated emissions of applicable pollutants would be well below the conformity *de minimis* levels for the Hampton Roads Ozone Maintenance Area. Therefore, emissions from the Proposed Action would show conformity under the Clean Air Act.

Table I-39: Emissions in Hampton Roads AQCR Ozone Maintenance Area Under All Alternatives

Vessel	Number of Vessels	Number of One-Way Trips Per Package	Number of Packages	Total Hours (0–3 nm)	Annual Criteria Pollutant[1] Emissions (tons/year)	
					NO_x[2]	VOC[2]
Ocean Tug Towing ex-Enterprise from existing location to commercial dismantlement facility	3	1	1	9.3	0.49	0.01

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds).

[2] Ozone is a secondary pollutant tracked by its precursor, NO_x and VOC.

Notes: NO_x = nitrogen oxides, VOC = Volatile Organic Compound

Alternative 1 (Single Reactor Compartment Packages) and Alternative 2 (Dual Reactor Compartment Packages) of the Proposed Action involve operating river tugboats to support barge transport of reactor compartment packages from Puget Sound Naval Shipyard & Intermediate Maintenance Facility, Washington for final disposal via the Columbia River to the Port of Benton barge slip. Vessels performing this action would transit through the Wallula PM_{10} Maintenance Area. As a result, Proposed Action emissions were evaluated to assess compliance with the General Conformity Rule *de minimis* thresholds for PM_{10} (Table I-40).

Table I-40: Criteria Pollutants *de minimis* levels for Wallula PM_{10} Maintenance Area

Criteria Pollutant/Precursor	*de minimis levels (tons/year)*
Particulate Matter ≤ 10 microns in diameter (PM_{10})	100

The methods for estimating vessel emissions involve generating the average running hours for vessels in the maintenance area. Vessel emissions from river tugboats were calculated using the EPA *Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emission Inventories*

Draft Report for the propulsion and onboard generation systems. Data from the EPA methodology included emission factors for each type of propulsion and type of onboard generator by ship type, as well as the fuel used. To determine the emissions from vessel activities, the number of vessels was multiplied by the number of one-way trips per transport package, multiplied by the estimated trip duration in the Wallula PM10 Maintenance Area, multiplied by the total number of packages. Transit distance and PM_{10} emission factors are shown in Table I-41.

Table I-41: Transit Information and PM_{10} Emission Factor

Vessel	Approximate Single Trip Total Mileage (miles)	Average Speed (miles per hour)	Single Trip Duration (hrs)	PM_{10} Emission Factor (lb./hr) Propulsion Engines + Generators
River Tug through Wallula PM_{10} Maintenance Area	12	8	1.5	1.81

Notes: PM_{10} = Particulate Matter ≤ 10 microns in diameter, hrs = hours, lb./hr = pounds per hour

Based on the air quality analysis for Alternative 1 (Table I-42) and Alternative 2 (Table I-43), the maximum estimated emissions of PM_{10} would be well below the conformity *de minimis* levels for the Wallula PM_{10} Maintenance Area. Therefore, emissions from the Proposed Action would show conformity under the Clean Air Act.

Table I-42: Emissions in Wallula PM_{10} Maintenance Area Under Alternative 1

Vessel	Number of Vessels	Number of One-Way Trips Per Package	Number of Packages	Total Duration (hrs)	Annual PM_{10} Emissions (tons/year)
River Tugs through Wallula PM_{10} Maintenance Area	2	1.5	8	36	**0.03**

Notes: PM_{10} = Particulate Matter ≤ 10 microns in diameter, hrs = hours

Table I-43: Emissions in Wallula PM_{10} Maintenance Area Under Alternative 2

Vessel	Number of Vessels	Number of One-Way Trips Per Package	Number of Packages	Total Duration (hrs)	Annual PM_{10} Emissions (tons/year)
River Tugs through Wallula PM_{10} Maintenance Area	2	1.5	4	18	**0.02**

Notes: PM_{10} = Particulate Matter ≤ 10 microns in diameter, hrs = hours, lb./hr = pounds per hour

Affected Areas: Hampton Road AQCR No. 223 1997 8-hour Ozone Maintenance Area; Wallula PM_{10} Maintenance Area

Date RONA Prepared: April 3, 2023

RONA Prepared by: ManTech International

I.3.2 Proposed Action Exemptions

The Proposed Action is exempt from the General Conformity Rule requirements based on the determination that the emissions are well below the *de minimis* threshold for all applicable pollutants.

I.3.3 Emissions Evaluation Conclusion

The Navy concludes that *de minimis* thresholds for affected pollutants would not be exceeded as a result of implementation of the Proposed Action. The emissions data supporting that conclusion is shown in Table I-39, Table I-42, and Table I-43 presented herein. The calculations, methodology, data, and references are contained in Section 3.6 (Air Quality) and in this appendix. Therefore, the Navy concludes that further formal Conformity Determination procedures are not required, resulting in this RONA.

I.3.4 RONA Approval

Signature: _____ Date: 07 April 2023

Amanda Stuhldreher
Assistant Deputy Director for NEPA, Naval Nuclear Propulsion Program

REFERENCES

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U.S. Environmental Protection Agency. (2018). *Heavy-Duty Highway Compression-Ignition Engines and Urban Buses: Exhaust Emission Standards*. Washington, D.C.: U.S. Environmental Protection Agency, Office of Transportation and Air Quality.

U.S. Environmental Protection Agency. (2020). *Methodologies for Estimating Port-Related and Goods Movement Mobile Sources Emission Inventories: Draft*. Washington, D.C.: U.S. Environmental Protection Agency, Office of Transportation Air Quality.